

PLANNING FOR THE TWENTY-FIRST CENTURY CLASSROOM:
TEACHER PREPARATION AND TECHNOLOGY

By

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Abstract

This study, framed as a qualitative study (Merriam, 2009; Stake, 2005), examined the technology preparedness and technology application of pre-service teachers during their practicum experiences in the field. The study followed three pre-service teachers at a Midwestern university who were enrolled in a semester-long practicum course for teaching secondary English/Language Arts. Methodology included collection and analysis of the following: TPACK survey; individual interviews of the pre-service teacher focal cases, educational technology faculty, and university practicum supervisor; focus group; classroom technology blog; artifacts from the field; and educational technology course syllabus analysis. The comprehensive study record (Patton, 2002) provided a storied landscape for focused analysis. The study found that how the pre-service teachers applied their technology knowledge and skills to the field depended upon the following: the individual attitudes of the pre-service teacher and cooperating teacher toward classroom control and technology integration, the cooperating teacher's ability to integrate technology in the classroom, and the technology available in the field placement classroom. The study also found the university teacher education program provided the focal students with a foundation for cursory technology integration; however, it did not consistently infuse technology with content area teaching. It should not be assumed that Millennial pre-service teachers know how to automatically integrate technology with pedagogy and content knowledge in a meaningful manner. Pre-service teachers must understand the importance of methodical planning for technology in content area teaching, see the need to implement it, and view themselves as competent in this fusion. In order to help prepare them for the twenty-first century classroom, pre-service teachers

need preparation and experience in considering and practicing the merging of digital technologies with pedagogical content and instruction.

For Matt, who always believes

For Sean and Kate, my best teachers

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Chapter One:

Introduction

As the twenty-first century classroom evolves and schools integrate new digital technologies, teachers need to be prepared to apply theory and practice related to these technologies in the classroom to support student learning. When incorporated thoughtfully, technology has the potential to transform the teaching and learning within the traditional classroom and enhance the meaningful interaction between students and teachers (Archambault, Wetzel, Foulger, & Williams, 2010; Rowley, Dysard, & Arnold, 2005; Unsworth, 2008). In addition, blended, hybrid, and online learning continue to grow rapidly in the United States with programs available to K-12 students in all 50 states (Kennedy & Archambault, 2012). This technology infusion necessitates a relevant and comprehensive preparation of pre-service teachers in teacher education programs, including the infusion of technology within content area practice and teaching. However, teacher education programs have not consistently addressed the changing needs of pre-service teachers, including how to teach with digital technologies (Alger & Kopcha, 2009; Mishra & Koehler, 2006).

To prepare pre-service teachers to teach in twenty-first century classrooms, teacher education programs place a heavy focus on technology tool training (Borko, Whitcomb, & Liston, 2009; Mishra & Koehler, 2008). However, as these pre-service teachers begin their teaching career, some are hesitant to replace traditional techniques with new forms of technology. Teachers who are critical of implementing digital technologies in their classroom discuss a fear of losing the emphasis on the traditional curricula, while for other teachers, there is a fear of the unknown, feeling clueless with

these technologies, and, at times, alluding to feeling less competent with technologies than their students (Archambault et al., 2010; Petko, 2012).

While technology tool training is necessary, it is not that simple. Beyond simply learning how to use a new computer program or an interactive whiteboard, pre-service teachers need direction and focused experiences to thoughtfully infuse the technologies in ways that are relevant and help them build engaging and authentic learning experiences for students. As Darling-Hammond (2006) analyzes twenty-first century teacher preparation, she highlights the need for cohesion and integration, bringing subject matter learning together with content pedagogy and incorporating cross-curricular connections. Recent research shows that while some teacher education programs are attempting to include technology tools on a somewhat cursory level, the tools are, at times, not included in a meaningful manner (Borko et al., 2009; Mishra & Koehler, 2006). Furthermore, little consistency can be found in how teacher education programs are integrating technology to prepare pre-service teachers (Archambault et al., 2010).

Borko et al. (2009) suggest that the cursory and inconsistent technology inclusion in teacher education programs is due to the complex and dynamic nature of the new digital technologies. Further, Mishra and Koehler (2008) claim that this dynamic nature of technologies presents teacher education with a “wicked problem,” (p. 2). As described by Rittel and Weber (1973), wicked problems occur in complex and unique social contexts and have a variety of possible solutions that are difficult to recognize because of interdependencies and contexts. With a wicked problem, solutions are not viewed as right or wrong; they are simply viewed as improvements to varying degrees and thought of as better, worse, good enough, or not good enough. The dynamic nature of these new

technologies and the complexity of interdependent variables make it difficult for teacher education programs to consistently respond to the needs of the twenty-first century classroom teachers, and there is not a simple, definitive solution (Borko et al., 2009; Koehler & Mishra, 2008). However, despite these challenges, teacher education programs must prepare pre-service teachers with the knowledge and skills to teach with digital technologies. Thus, an important question is: How should teacher education programs help prepare pre-service teachers to teach with technology in dynamic classrooms?

Despite the dynamic nature and challenges of this issue, there is a growing interest in the effective and relevant preparation of teachers for the digital age. In fact, forty-four states have adopted standards for teachers that incorporate digital technology (Borko et al., 2009). Further, as teacher education programs consider how to respond to the role of technology, the 2008 standards published by the National Council for the Accreditation of Teacher Education (NCATE) provide guidance in ensuring pre-service teachers integrate technology into their practice. The NCATE standards highlight how a candidate's knowledge and skills related to teaching with technology should be incorporated into coursework as well as field experiences. The NCATE standards also include specific rubrics addressing this technology integration. In addition to this guidance from NCATE, many teacher education programs are adopting standards that align with the National Educational Technology Standards for Teachers (NETS-T), published by the International Society for Technology in Education (ISTE), to advance the digital age of teaching.

More recently, researchers have started focusing on the “hows” of technology infusion into pre-service teacher education, and they are attempting to create a guiding framework for preparing teachers to transition into twenty-first century classrooms that addresses many of the NET-S (2008) standards. In addressing the need for such a framework, Mishra and Koehler (2006) suggest a movement toward teaching technological pedagogical content knowledge to pre-service teachers, originally conceptualized as TPCK and now known as TPACK—technology, pedagogy, and content knowledge (Koehler & Mishra, 2009). These researchers expand on Shulman’s (1986) concept of pedagogical content knowledge (PCK) and aim to take traditional teacher education to the digital twenty-first century level. Mishra and Koehler’s (2006) TPACK has become a leading concept in the field, as it bridges Shulman’s (1986) conceptualization of PCK with technology. However, there is some debate and controversy regarding how to effectively integrate TPACK in pre-service teacher education programs, and some researchers are suggesting a modified framework that connects the concepts of the TPACK to specific content area courses within pre-service teacher education programs (Angeli & Valanides, 2009; Archambault & Crippen, 2009; Graham, 2011; Koehler & Mishra, 2009; Schmidt et al., 2009).

Purpose and Research Questions

It is clear through the growing body of research that it is important for teacher education programs to prepare teachers to use digital technologies, and there is guidance through the TPACK framework, as well as NCATE and NET-S standards. However, this technology preparation is still a challenge for teacher education programs. As is the nature of this wicked problem, the literature reflects the complexities within each context,

making it difficult for teacher education programs to adopt a simple plan. Regardless, research shows how many teacher education programs are working toward what Unsworth (2008) defines as a “literacy of fusion,” promoting a merging of literacy practices in digital technologies with those associated with traditional school curricula (p. 71). However, teacher education programs also need to infuse technology within content area coursework and field experiences, to address pre-service teachers’ needs to develop the knowledge and skills to teach with digital technologies (Alger & Kopcha, 2009; Mishra & Koehler, 2006). Thus, to better understand the challenges in teacher education programs, my study investigated pre-service teachers’ understanding of the TPACK components and examined how they applied that knowledge into their field placement. Specifically, the research questions that guided my study are the following:

1. How well does a teacher education program prepare pre-service teachers’ construction of technological pedagogical content knowledge (TPACK)?
2. How do pre-service teachers apply their technology knowledge and skills to their experiences in the field?

Overview of Theory and Method

My study, framed as a qualitative study (Merriam, 2009; Stake, 2005), examined the technology preparedness and technology application of pre-service teachers during their practicum experiences in the field. These pre-service teachers were enrolled in a university located in the Midwest portion of the United States, and they were enrolled in a semester-long practicum course for teaching secondary English/Language Arts.

Specifically, my study followed a small group of pre-service teachers, who taught middle school students during their practicum experience, to address the research questions.

The comprehensive study record (Patton, 2002) provided a storied landscape for focused analysis. Consistent with Patton's (2002) description, this study record organized the "voluminous case data into a comprehensive, primary resource package" where pieces were "fitted together and the case record is organized for ready access either chronologically and/or topically," (p. 449). Data were coded, as Merriam (2009) describes, for emerging themes and differing perceptions within the survey, blog posts, focus group, and interview responses, as well as the provided pre-service teachers' artifacts from the field.

This study investigated the experiences of three pre-service teachers, Amy, Jill, and Mike, as they embarked on their journeys into the middle school field placements. The data were collected throughout the semester-long practicum experience, which took place during the 2013-2014 school year. This qualitative study collected and analyzed data from the TPACK survey, individual interviews (pre-service teacher focal cases, educational technology university instructors, and university practicum supervisor), focus group of pre-service teacher focal cases, classroom technology blog, artifact collection, and educational technology course syllabus analysis.

Organization of the Dissertation

After this introduction, I include a review of the current literature in chapter two, which situates my study within two areas of research: the research on preparing pre-service teachers to teach with digital technologies and the research on integrating technology with teaching English language arts. Further, in chapter two, I also present

Mishra and Koehler's (2006) TPACK framework, which demonstrates the complex nature of integrating technology with pedagogy and content area teaching, and the growing body of TPACK-related research, including the TPACK survey (Schmidt et al., 2009).

Chapter three discusses the methodology, and I include a discussion of the qualitative study methodology and the principles of the philosophy that guided my inquiry. I also provide a detailed discussion of how I gathered, coded, and analyzed data. In addition, I include a brief introduction to the major and minor participants of the study, the three university focal students, as well as the university field supervisor and faculty member. Finally, in chapter three, I include the context of the study, which includes both the university's teacher education program and also the focal students' field placements in the local school district.

In chapter four, I present the findings of the study, beginning with the focal students' TPACK findings, followed by a discussion of technological adaptability and the Millennial generation. I also include a discussion of the pre-service teacher/cooperating teacher attitudes toward classroom control and technology integration and the cooperating teacher's ability to integrate technology in the classroom. Additionally, I highlight the individual journeys of this study's three focal students as they enter the field, and I examine their classroom technology access and discuss how they apply their technology knowledge and skills to the field.

Chapter five includes a discussion that connects the findings of the pre-service teachers' journeys with the research on TPACK and the technology preparation of pre-

service teachers. Furthermore, I discuss the implications of this study and directions of future research in technology infusion and pre-service teacher preparation.

Chapter Two:

Technology and the Preparation of Pre-service Teachers

My dissertation study is informed by research on preparing pre-service teachers to teach with digital technologies (e.g., Abbitt, 2011; Angeli & Valanides, 2009; Archambault & Crippen, 2009; Graham, 2011; Kymes, 2005; Petko, 2012) and research on integrating technology when teaching English language arts (e.g., Baker & Labbo, 2007; Grabill & Hicks, 2005; Groenke, 2008; Kajder, 2004; Rochette, 2007; Rowley et al., 2005; Stevens & Brown, 2011; Unsworth, 2008). Further, Mishra and Koehler's (2006) TPACK framework, which demonstrates the complex nature of integrating technology with pedagogy and content area teaching, the growing body of TPACK-related research, and the TPACK survey (Schmidt et al., 2009), guide the study. While technology is being integrated into traditional classrooms, and becoming more common in schools and communities, questions have been raised regarding the use of effective instructional strategies in the digital age of education. Which instructional strategies should be introduced to and practiced by pre-service teachers? Further, how should these instructional strategies be implemented in their training—within the pre-service teacher's content area, as part of a general educational technology course, or both? How can pre-service teacher education programs better prepare pre-service teachers for thoughtful technology infusion in the twenty-first century classroom? In addition, for teachers and teacher education programs, additional research is needed to help identify effective ways of integrating literacy strategies with digital technologies, based on sound pedagogy and content knowledge.

Research shows that teachers can feel unprepared and overwhelmed with teaching with the new technologies and recognizes that this has led to the need for a framework regarding infusing technology in education across the curriculum (Baker & Labbo, 2007; Petko, 2005; Rowley, Dysard, & Arnold, 2005). Likewise, teachers, school districts, and universities are showing increased interest in understanding how technologies should be infused into the curriculum.

What technologies can be integrated into a classroom and how can these technologies help students to learn content in class, including a blended or online classroom environment? How should teacher education programs incorporate technology to help better prepare pre-service teachers for the digital classroom environment? Since technology changes so rapidly, it is difficult for researchers to know the current technologies that teachers and students are using in the classroom.

Despite the dynamic nature of this issue, there is growing interest in the effective and relevant preparation of teachers for the digital age. Forty-four states have adopted standards for teachers that incorporate digital technology (Borko et al., 2009). As teacher education programs consider how to respond to the role of technology, the 2008 standards published by the National Council for the Accreditation of Teacher Education (NCATE) provide guidance in ensuring pre-service teachers integrate technology in their practice. The NCATE highlights how technology should be included in the candidate's practice, field experience, and teaching by faculty and includes the following descriptors of how specific standard rubrics address technology integration:

Standard 1: Candidate Knowledge, Skills and Dispositions expect that candidates use technology in their practice and facilitate student learning through the integration of technology.

Standard 3: Field Experiences and Clinical Practices expect that candidates have the opportunity in their field and clinical experiences to use technology to support teaching and learning.

Standard 5: Faculty Qualifications, Performance and Development expect that faculty integrate technology into their teaching.

Standard 6: Unit Governance and Resources expects the unit to have adequate information technology resources to support faculty and candidates. (NCATE, 2008)

In addition to this guidance from NCATE, many of the standards adopted by teacher education programs are also aligned with the National Educational Technology Standards for Teachers (NETS-T), which are published by the International Society for Technology in Education (ISTE) to advance the digital age of teaching. The ISTE (2008) NETS-T include the following:

1. *Facilitate and inspire student learning and creativity:* Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.
2. *Design and develop digital age learning experiences and assessments:* Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize

content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS-S.

3. *Model Digital Age work and learning:* Teachers exhibit knowledge, skills, and work processes representative of an innovative profession in a global and digital society.
4. *Promote and model digital citizenship and responsibility:* Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.
5. *Engage in professional growth and leadership:* Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources. (ISTE, 2008)

More recently, researchers have started focusing on the “hows” of technology infusion and pre-service teacher education, attempting to develop a guiding framework for preparing teachers to transition into twenty-first century classrooms, and addressing many of the concepts in the ISTE (2008) standards. Mishra and Koehler (2006) suggest a movement toward teaching technological pedagogical content knowledge to pre-service teachers, originally conceptualized as TPCK and now known as TPACK—technology, pedagogy, and content knowledge (Koehler & Mishra, 2009). The researchers expand on Shulman’s (1986) concept of pedagogical content knowledge (PCK) and aim to take traditional teacher education to the digital twenty-first century level. Mishra and Koehler’s (2006) TPACK has become a leading concept in the field, as it bridges Shulman’s (1986) conceptualization of PCK with technology; however, there is

inconsistency and controversy regarding how to teach TPACK to teachers (Angeli & Valanides, 2009; Archambault & Crippen, 2009; Graham, 2011; Koehler & Mishra, 2009).

To understand these inconsistencies and controversies, it is helpful to understand the historical disconnect between content and pedagogy in teacher education programs (Shulman, 1986). As Shulman (1986) presents the differences between the late 1800s' emphasis on strong subject matter content knowledge and the 1980s' emphasis on pedagogical knowledge with little subject matter content knowledge, he raises key questions regarding both unbalanced approaches in analyzing the history and potential future of teacher education programs. Shulman (1986) explains how the "missing paradigm" of subject matter in the 1980s was alarming, especially considering that "a century ago the defining characteristic of pedagogical accomplishment was knowledge of content," (p. 6). Shulman (1986) questioned the research trends at the time and the absence of the link between subject matter content and teaching in the field.

Shulman (1986) describes pedagogical content knowledge (PCK) as a necessary concept in providing pre-service teachers with a comprehensive and balanced education, merging pedagogy with content knowledge. Subsequently, teacher education programs began to shift toward this comprehensive approach, offering education courses and tracks specific to the teaching of content areas (Darling-Hammond, 2006; Shulman, 1987). Similar to Shulman's (1986) discussion from years ago, a growing body of research suggests a need to further conceptualize PCK for the twenty-first century and address the missing paradigm of technology in teacher education (Mishra & Koehler, 2006; Schmidt et al., 2009). Darling-Hammond (2006) discusses the resulting coherence and integration

when “subject matter learning is brought together with content pedagogy through courses that treat them together,” (p. 306).

In the past, researchers have suggested adaptations to Shulman’s (1986) PCK to reflect the dynamic nature of teaching and learning. Cochran, DeRuiter and King (1993) viewed PCK through a constructivist lens, discussed the need for the concept to show the fluidity of knowing, rather than the stagnant nature of knowledge, and conceptualized pedagogical content knowing (PCKg). Some researchers argue the need for Mishra and Koehler’s (2006) TPACK to also reflect the dynamic nature of knowledge and knowing as well (Angeli & Valanides, 2009). Regardless, the TPACK framework continues to guide a large body of research in the field.

The contexts of the TPACK framework and the complexities between technology, pedagogy, and content knowledge are critical in discussing the direction of pre-service teacher education and ongoing professional development (Figure 1). Schmidt et al. (2009) define the three main concepts of technology knowledge, pedagogical knowledge, and content knowledge, as well as the four overlapping concepts of pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge of the TPACK framework (p. 125):

1. Technology knowledge (TK): Technology knowledge refers to the knowledge about various technologies, ranging from low-tech technologies such as pencil and paper to digital technologies such as the Internet, digital video, interactive whiteboards, and software programs.
2. Content knowledge (CK): Content knowledge is the “knowledge about actual subject matter that is to be learned or taught” (Mishra & Koehler, 2006, p. 1026). Teachers must know about the content they are going to teach and how the nature of knowledge is different for various content

areas.

3. Pedagogical knowledge (PK): Pedagogical knowledge refers to the methods and processes of teaching and includes knowledge in classroom management, assessment, lesson plan development, and student learning.
4. Pedagogical content knowledge (PCK): Pedagogical content knowledge refers to the content knowledge that deals with the teaching process (Shulman, 1986). Pedagogical content knowledge is different for various content areas, as it blends both content and pedagogy with the goal being to develop better teaching practices in the content areas.
5. Technological content knowledge (TCK): Technological content knowledge refers to the knowledge of how technology can create new representations for specific content. It suggests that teachers understand that, by using a specific technology, they can change the way learners practice and understand concepts in a specific content area.
6. Technological pedagogical knowledge (TPK): Technological pedagogical knowledge refers to the knowledge of how various technologies can be used in teaching, and to understanding that using technology may change the way teachers teach.
7. Technological pedagogical content knowledge (TPACK): Technological pedagogical content knowledge refers to the knowledge required by teachers for integrating technology into their teaching in any content area. Teachers have an intuitive understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK) by teaching content using appropriate pedagogical methods and technologies.

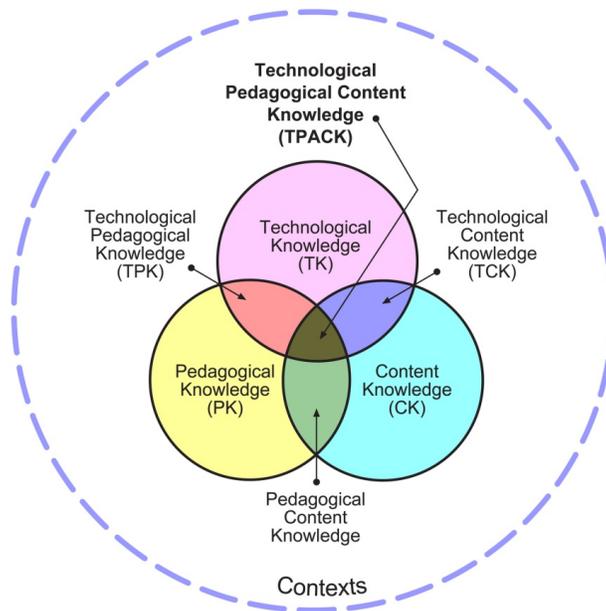


Figure 1: TPACK Framework
Source: Koehler and Mishra (2009)

Abbitt's (2011) study revealed that using the TPACK framework in pre-service teacher education resulted in increased self-efficacy beliefs for pre-service teachers, specifically within the knowledge domain. In addition, the study found that this relation between knowledge and increased self-efficacy was most apparent with knowledge was blended with technology in the TPK, TCK, and TPACK domains when compared to the technology-absent PK and CK (Abbitt, 2011). This relation presents the importance of using a framework like TPACK in teacher education programs to help pre-service teachers believe they are capable and competent in effectively integrating technologies in the classroom.

Many researchers are focusing on the application of the TPACK framework in current classrooms and investigating its potential to guide pre-service teachers in technology implementation (Angeli & Valanides, 2009; Archambault & Crippen, 2009; Graham, 2011; Koehler & Mishra, 2009). Graham (2011) notes that there is a need for

additional research that discusses how to clarify and define the various TPACK domains. These boundary conditions would be helpful in effectively teaching TPACK to pre-service and in-service teachers. Subsequently, some researchers have acknowledged a need for reliable assessment tools regarding the measurement of TPACK and the need to examine teachers' perceptions of each component (Angeli & Valanides, 2009; Archambault & Crippen, 2009; Koehler & Mishra, 2009). With further research that supports the inclusion of each construct in the framework, the TPACK framework has the potential to be a viable one for guiding teacher education programs (Graham, 2011).

Teacher Education Technology Infusion

In examining teacher education in the digital age, Baker and Labbo (2007) found that there are two challenges facing teacher educators today: teaching pre-service teachers how to respond to individual student's literacy needs and teaching pre-service teachers how to use new technologies for literacy instruction. Several other researchers have noted these challenges with literacy and technology as well, and Stevens and Brown (2011) explain that teacher-educators should infuse technology into the courses they teach and encourage future teachers to become critical multicultural literacy educators.

In addition, a growing body of research details how some pre-service teacher education programs are attempting to infuse Web 2.0 interactive tools, blogs, ICTs, and supplemental online modules within the coursework in order to better prepare pre-service teachers for twenty-first century classrooms (Archambault et al., 2010; Stevens & Brown, 2011). This embedding of technologies within the pre-service teacher courses is a clear step toward technology infusion in teacher education with some valuable observations to

note; however, there are distinct challenges in the inconsistency between programs, as well as varying reactions from teacher education faculty and students.

Baker and Labbo (2007) found that pre-service teachers voiced concerns regarding what to do with the computers in the classroom and how to find time to integrate technology, knowing that their students' futures will likely include the need for mastery of the new literacies. Petko (2012) highlights this issue and discusses what happens when teachers are not given technology that fits with their curriculum, and/or when teachers are simply unaware of how to use the technology available to promote effective literacy instruction. As Petko (2012) explains, there is a multidimensional relationship between a teacher's "will, skill, and tool" when incorporating technology. This multidimensional relationship provides more insight into the challenges that Baker and Labbo (2007) found in their study. Petko's findings explain why we have teachers with dusty, barely used SMART boards and an untapped world of technology that is just a few clicks away. Beyond actually having the basic skills and training, for successful technology implementation to occur in the classroom, teachers must individually believe in the positive possibilities of technology for student learning, and they must also personally perceive themselves as competent with the new digital technology (Petko, 2012). These studies present challenges that pre-service and in-service teachers encounter with integrating technology

In addition to the findings of Baker and Labbo (2007) and Petko (2012), Rowley, Dysard, and Arnold (2005) also found that to help with this technology infusion, pre-service teachers benefitted from faculty modeling. Through the implementation of what Rowley et al. (2005) identify as the online "TeacherLine modules," pre-service teacher

education courses resulted in modeling and a positive learning experience for most students. The university used this program to examine how to meet the new standards of the International Society for Technology in Education (ISTE) and National Council for the Accreditation of Teacher Education (NCATE). More than half of the faculty that participated in the Rowley et al. (2005) study reported the belief that the infusion helped students build their technology skills. In addition, 55% of students responded that the technology infusion had helped them improve their personal technology skills. Interestingly, the smaller group of students with instructors who were not fully supportive of using this online service found that the experience was not as positive, and some students reported the experience as negative, when compared with students who had instructors with more investment in the online TeacherLine modules.

It is also important to note that Rowley et al. (2005) requested that faculty in this program assess content from the TeacherLine modules to encourage student investment, and many of the faculty members complied with this request. The ones who did not comply with this request were also the faculty members who did not see the need for the program and/or did not believe in its potential to help students with technology learning. This note also highlights the need to research faculty attitudes and the “will” piece of the Petko (2012) model. In addition, pre-service teachers responded that the program in Rowley et al. (2005) “exposes teachers to online and technological resources they might not otherwise know about,” and “TeacherLine helps future teachers plan ways to include technology in their classroom,” (p. 120). However, a few negative responses included difficulty navigating the TeacherLine site or frustration with watching videos correctly. Rowley et al. (2005) found that the faculty needed more support with the new

technologies, and the university planned to provide additional training. Additional research is needed regarding the impact of faculty attitudes toward technology on effective teaching and learning, perhaps further investigating Petko's (2012) "will, skill, and tool" model within teacher education programs.

As Howland and Wedman (2004) discuss, faculty technology training must move beyond simply teaching a tool in isolation and also move toward a process-driven model. The process-oriented perspective includes "an awareness of what the technology can offer, opportunity to explore technology integration, time to learn the technology, application of technology to teaching, and reflection on teaching," (p. 241). Howland and Wedman's (2004) study shows the power of faculty professional development based on the process-driven model. In addition, the researchers note that faculty chose which types of technology experiences in which they would participate, and faculty members received individualized professional development plans. As part of the faculty training, each participant was assigned with a "SWAT" (Student Wizard Assisting Teachers) team member for weekly, individualized teaching sessions. To add more relevant awareness, the participant faculty also engaged in field trips to K-12 schools in order to observe technology in the classrooms and attended workshops on campus in computer labs.

Howland and Wedman (2004) found that the faculty experienced metacognitive processes through reflective journaling and note-taking throughout the process. The faculty in Howland and Wedman's (2004) study also reported that after the professional development process, they were giving fewer lectures in their pre-service classes, and they reported a more frequent use of project-based and problem-based learning. This movement to incorporate technology shows the importance of relevant, individualized

faculty training. Those who educate pre-service teachers need time to practice, apply, and reflect on this technology tool integration.

According to Archambault et al. (2010), "...although faculty may not be digital natives to social networking technologies, they must become wise digital immigrants who plan for them in effective instruction" (Archambault et al., 2010, p. 4). Pre-service teachers need training with the new technologies and tools, and it would be logical to train teacher educators in order to facilitate this progression.

Archambault et al. (2010) also express the importance of positive faculty experiences and attitudes and training in digital technologies, more specifically social media classroom integration. Grabill and Hicks (2005) and Unsworth (2008) also acknowledge the rapid growth of Web 2.0 tools, online platforms for social interaction, and found that progressive university instructors successfully included them in teaching pre-service teachers. When faculty members use social networking tools with their students, communication and feedback have the potential to become more efficient, effective, and formative. A growing body of literature supports the interactive role of Web 2.0 technologies, and the power of increased interaction regarding active learning engagement (Boulos & Wheeler, 2007).

However, it must also be noted that some teachers and students do not see the value of such technology implementation and practice, showing how the "will" piece of Petko's (2012) model is so critical. Stevens and Brown (2011) researched the use of blogs with graduate students in an education program. The students created and updated blogs for Holocaust education and reflection, and each blog became a place where students could collaborate and share specific ideas addressing contradictions and

providing insights in world issues. These casual, yet very thoughtful comments, at times, blended critical literacy and multicultural education, and often demonstrated thoughtful reflection and questioning. Stevens and Brown (2011) note that for challenging topics and serious world issues, blogging can be a positive space for students to share, connect, and question with their classmates, and blogging is one simple tool that teacher educators may include to encourage relevant social interaction with subject matter content knowledge.

Individual student views on the activity varied, and Stevens and Brown (2011) describes the contrast in these students' experiences. One participant who was noted in the Stevens and Brown (2011) study did not see blogging as a replacement for part of the face-to-face time of the class, and the participant reported less interest and motivation with the activity. Consequently, her attitude that blogging lacked a purpose was reflected in her own postings. Stevens and Brown (2011) explained that this student's postings often mirrored the quality of postings of other students in the course.

On the other hand, another participant who was noted in the same Stevens and Brown (2011) study, held the attitude that blogging can be a powerful medium for learning and sharing ideas. She also enjoyed the flexibility of blogging independently of the traditional classroom. Her postings were not mediated by the quality of postings submitted by the other students in the course. Rather, her postings showed that found blogging to be an important tool that she wanted to master for her own teaching. The researchers' findings regarding pre-service teacher attitudes are similar to the findings of other researchers regarding current teachers' attitudes toward technology and the impact on student learning (Petko, 2012; Rowley et al., 2005).

As for technology tools and resources, there have been several reviews of lists of technology sites, programs, and platforms. However, additional research needs to focus on the strategies for technology infusion in the classroom and the “hows” of teaching with technology in a meaningful and relevant way. Baker and Labbo (2007) focus on creating lists of resources and categorizing them by literacy focus, type of resource, and providing links or software information to help pre-service and current teachers. The types of literacy focus include building literacy skills, process-writing approaches, and literature resources. Some of the actual resources include links to online poetry discussions, electronic pen pals who discuss literature, sites where teachers can create online discussion forums, literature-based blogs, links to child-friendly search engines, virtual field trips, multimedia composition software, and more.

Since pre-service teachers had identified a lack of knowledge regarding practical implementation of new technologies, Baker and Labbo (2007) have provided invaluable lists of resources to share. They add, “Some teacher educators set up course listservs, which simultaneously facilitate course communication and demonstrate to pre-service and inservice teachers how they too can use listservs to support literacy in their classrooms,” (Baker & Labbo, 2007, p. 37). This reiterates how powerful modeling the integration of new technologies can be at all levels of education, but we have to remember how crucial this is for our future educators.

Providing and modeling access to tools can be pivotal in guiding pre-service teachers, but it is also critical to remember that digital technologies are more than just tools for some members of the digital generation, as they often result in interactive communities and social spaces (Grabill & Hicks, 2005). Students explain that they feel

they have a real purpose when they write online, as computer networks are alive with others who are engaged in a similar process (Hogue, 2004). Through blogging, synchronous discussion boards and other interactive technologies, teachers have the ability to incorporate these modern technologies to develop students' multiliteracies. Grabill and Hicks (2005) and Unsworth (2008) argue that teachers truly have the responsibility to implement these technologies in traditional and online classrooms, as they are increasingly becoming integral pieces in the world of communication. And, in addition to providing the tools and lists of resources, it is imperative to delve deeper in teacher preparation and training. Pre-service teachers should be given relevant practice with content area technology integration in traditional, blended, and online classrooms.

In addition, when investigating the more recent movement of online and blended teaching and learning, Alger and Kopcha (2009), Archambault et al. (2010), and Kennedy and Archambault (2012) discovered that teachers feel there is a greater need to understand appropriate pedagogy for the online classroom, and they suggest various adaptations to Mishra and Koehler's (2006) TPACK framework. While there is a great focus on technology implementation in the traditional classroom, a smaller, yet growing, group of researchers have investigated teachers' needs in being prepared for online and blended learning.

Online learning is a relatively new, multimodal form of distance learning that began in the 1990s with the increased access to the Internet. However, the concept of learning from a distance is not new. The earliest form of correspondence learning can be traced back to 1891 with courses at the University of Chicago (Greenway & Vanourek, 2006). The university sent learning materials to K-12 students via postal mail. What is

new in the twenty-first century is the use of rapidly changing digital technologies, and we cannot ignore its growing presence.

Online learning, which may include synchronous live classes and asynchronous lessons, and blended learning, which is a combination of online and traditional classroom learning, are both growing across the nation. Online and blended teachers have the potential to reach a diverse group of students at various levels—children and adults with special needs, migrant students, children who were bullied, pregnant teens, students working to support themselves or their families, rural and urban students without access to Advanced Placement or honors courses, students in high-crime areas who are afraid to go to school, and so on (McManus, 2012). This is one of the more powerful and transformational benefits of technology that I see in my online English classroom—the transcendence of boundaries to learning and the ability to provide learning resources to students who may otherwise disengage from school altogether. The diversity of learners also presents a unique challenge for online teachers, and pre-service teachers need preparation in effectively reaching the students.

Online courses are typically fully online and include asynchronous coursework. The coursework is often delivered through a learning management system (LMS), for example eCollege, Angel, or Blackboard Learning System, and the classroom teacher creates lessons and leads students through the coursework and practice (Kennedy & Archambault, 2012). Many online courses include live, synchronous sessions that occur in the teacher's virtual classroom. As Kennedy and Archambault (2012) describe, during these live sessions, the teacher facilitates learning and discussion in a web-conferencing software platform like Elluminate/Blackboard Collaborate, often with little or no training

in their teacher education backgrounds. Whereas, blended courses are defined as courses that meet face-to-face and incorporate online coursework, typically through the LMS. However, blended courses may also use webconferencing software as well.

Researchers have reported a lack of field experience in an online or blended classroom (Kennedy & Archambault, 2012). Many teacher education programs see the value of student teaching experiences in “traditional” classrooms for pre-service teachers, yet most do not include an online field experience. Darling-Hammond (2006) highlights the need for extensive, intensely supervised clinical work that closely aligns with course work. Darling-Hammond (2006) states that “teachers-in-training who participate in fieldwork with course work are better able to understand theory, to apply concepts they are learning in their course work, and to support student learning,” (p. 307). With a growing number of twenty-first century classrooms moving toward blended and online learning environments, Kennedy and Archambault (2012) discuss the need for pre-service teachers to engage in blended and online classroom field experiences in order to be effective with the technology.

Kennedy and Archambault (2012) sent surveys to administrators in charge of teacher education programs across the nation and found that there is a critical lack of understanding regarding the integration of theory and teaching practice that occurs online. Kennedy and Archambault (2012) also found that 404 of the 522 teacher education programs survey responders did not currently offer a virtual school field experience (VSFE). However, 50% of these responders reported that they felt their programs should offer VSFEs in some capacity. Thirteen universities explained that they are currently in the process of adding VSFEs to their teacher education programs.

Kennedy and Archambault (2012) received clearly defined and fully integrated VSFE models from seven programs.

Of the teacher education programs that already include VSFEs, Kennedy and Archambault (2012) discovered that all VSFEs required initial face-to-face meetings between cooperating teachers and pre-service teachers, and most required synchronous teaching through virtual platforms (Elluminate). The remaining communication occurred via Skype, Google Talk, email, phone, and web 2.0 tools (Facebook, Wiki, blogs, Twitter).

In the VSFEs, the pre-service teacher's responsibilities varied, but many were responsible for the following: facilitate class discussion forums, create new course content, communicate with students, track progress, communicate with parent/guardian, deliver synchronous instruction, participate in extracurricular activities, respond to student/parent questions, attend faculty meetings, complete required paperwork, attend professional development sessions, and evaluate students' work (Alger & Kopcha, 2009; Kennedy & Archambault, 2012). These VSFEs varied in length from four to fourteen weeks. While Alger and Kopcha (2009) and Kennedy & Archambault (2012) focused on the pre-service teacher's field experience, it would also be interesting to discover which teacher education programs include virtual school classroom observations and investigate the challenges of VSFEs for pre-service teachers as well.

Similar to Kennedy and Archambault (2012), Alger and Kopcha (2009) also focused on how a teacher education program integrated new technologies with pre-service teachers during field experiences. However, they used online learning to help provide additional support to San Diego State University pre-service teachers during their

field experiences in traditional school placements. The instructional program (eSupervision) was included in web-based course management systems, and it was based on the cognitive apprenticeship model. Pre-service teachers were required to complete five modules constructed with the ICARE system (Introduce, Connect, Apply, Reflect, Extend). The modules (Analyzing the Teaching Context, Classroom Management, Planning Instruction, Engaging the Learner, and Assessing the Learner) included specific outcomes to demonstrate learning and reflections. Interviews, observations forms, videoconferencing, discussion forums, reports, reflections, lesson plans, and videotaped lessons were the required pre-service teacher assessments.

As Alger and Kopcha (2009) explain, this integration of new technologies to the pre-service teacher field experience added a layer of depth with ongoing communication and fostering a community among the pre-service teacher, cooperating teacher, and student teaching supervisor: “To learn to construct less physical and tangible endeavors, such as teaching, requires making visible the thinking of experts, i.e. the thinking of the cooperating teacher and the student teaching supervisor, evident to the student teacher novices” (Alger & Kopcha, 2009, p. 36).

The new technologies also provided insight to the strengths and needs of the pre-service teachers. Shulman (1987) similarly described the process of watching students become teachers and observing their successes and errors as one that “highlights the complex bodies of knowledge and skill needed to function effectively as a teacher...the neophyte’s stumble becomes the scholar’s window,” (p. 4). The pre-service teachers in Alger and Kopcha’s (2009) study reported that eSupervision made them feel like they were in a support group and part of a community, similar to the TeacherLine experience

in the Rowley, Dysard, and Arnold (2005) study. Although the pre-service teacher's experience was not directly teaching online, they were practicing learning and communicating using new technologies.

Technology played a critical role in increasing communication and reflection during the field experience, and it also provided students with a blended learning experience (Alger & Kopcha, 2009; Rowley et al., 2005). Alger and Kopcha (2009) also explain similar findings to Archambault, Wetzel, Foulger, and Williams (2010) regarding the enhancement of traditional curricula through thoughtfully planned social media and authentic Web 2.0 tools. The researchers argue for a change in student teaching field experience that includes a technology-supported cognitive apprenticeship model (Alger & Kopcha, 2009).

With the influx on online and blended learning classrooms, pre-service teachers need supportive experiences with the synchronous and online delivery modes. Alger and Kopcha (2009), Archambault et al. (2010), and Kennedy and Archambault (2012) discovered that teachers feel there is a greater need to understand appropriate technological pedagogy for the online classroom, and they suggest various adaptations to Mishra and Koehler's (2006) TPACK framework. While many researchers are focusing on technology implementation in the traditional classroom, there is a growing need to research how teacher education programs may also help prepare pre-service teachers for online and blended teaching and learning.

Technology and Teaching English Language Arts

Reading digital texts can be challenging for students, and teachers need to consider strategies that will help support their learning. For example, when analyzing

reading strategies and hypertext comprehension, Salmeron, Canas, Kintsch, and Fajardo (2005) researched how technology and nonlinear text complicates how one defines reading comprehension and articulates the reading comprehension process. As they analyzed students' reading strategies and comprehension, they found that low-knowledge participant readers learned more by using the strategies of reading additional nodes, while the high-knowledge readers' learning was not affected by reading additional nodes. Salmeron et al. (2005) note that this shows the impact of prior knowledge, as the high-knowledge readers already had prior knowledge that they could use to fill in any gaps as they read the text. In addition, the researchers found that participants had greater understanding when the order of texts made sense and clearly transitioned from one to the next. The transitions supported the reader's need for coherence, and since this need was met through text order, the reader was able to focus more on comprehending the text. Coherent texts were beneficial for the low-knowledge learners; however, the high-knowledge learners in the study benefitted from less coherent texts. Salmeron et al. (2005) note that this difference is more apparent in nonlinear text when compared to linear text, and they highlight the need for more research in the comprehension process of hypertext. Despite the need for more research, pre-service teachers need to be aware that there are differences between reading linear and non-linear text and provide students with appropriate reading strategies.

As researchers explain, the online world has the potential to be a highly engaging source of learning, but the multi-dimensional aspect of the text, pictures, and links can cause comprehension problems for students. It is apparent that students need assistance in navigating through the overwhelming mode to truly comprehend it and find relevant

meaning (Brand-Gruwel et al., 2009; Hsieh & Dwyer, 2009; Petko, 2005; Raes et al., 2012). Similar to traditional comprehension issues and research, the technology-oriented research focuses on the application of teaching strategies, including scaffolding (computer/technology scaffolding and teacher scaffolding), rereading strategy, and think-alouds to assist in student learning. In addition, classrooms are attempting to fuse newer technologies like blogs and learning management platforms to increase student comprehension and build student skills with new technologies (Baker & Labbo, 2007; Rowley, Dysard, & Arnold, 2005; Stevens & Brown, 2011).

To help with educators with teaching with technology and supporting students with scaffolding online, Brand-Gruwel et al. (2009) created an information problem solving Internet model (IPS-I-model), which supports the idea that there is a clear comprehension process that students face as they sift through information online. The IPS-I model includes that students must possess the following main skills: define the information problem, search information, scan information, process information, and organize/present information (Brand-Gruwel et al., 2009). However, the model assumes that students have basic reading skills, evaluating skills, and computers skills. The model also includes four necessary self-regulation skills for students: orientation, monitoring, steering, and evaluating. It is important to note that students have shown difficulty self-regulating, and IPS studies have found that students either do not seek help or use ineffective strategies online, including the use of inaccurate information from web sources that students do not question (Fidel, 1999). The IPS-I-model draws attention to the need for teachers to help model self-regulation strategies with students and improve metacognitive regulation skills with students.

Teacher-enhanced and technology-enhanced scaffolding are two techniques that have the potential to help students with text comprehension and literacy learning online and learn how to self-regulate through metacognitive modeling (Kymes, 2005; Raes et al., 2012). Raes et al. (2012) investigated the use of scaffolding in a collaborative information problem solving experience. With multimodal scaffolding, the researchers aimed to understand if technology-enhanced scaffolding or teacher-enhanced scaffolding was more powerful. Consequently, they studied four conditions (a) technology-enhanced scaffolding, (b) teacher-enhanced scaffolding, (c) technology-enhanced and teacher-enhanced scaffolding, and (d) a control group that received no scaffolding from either source. The technology-enhanced scaffolding in this study included embedded hints and question prompts on the screen associated with each information problem task. The teacher-enhanced scaffolding included one-on-one cues from the teacher or human tutor as throughout the lesson. A few examples from the teacher scaffolding script include: Try to paraphrase or summarize ideas instead of just copying information word-for-word from your sources; What does your teacher want you to do?; Who is the writer of the website? Other teacher or tutor-scaffolds were similar to think alouds discussed in Kymes (2005), as the teacher or tutor thought aloud with the student and talked through the next logical step of the process for solving the problem.

The technology-enhanced scaffolding was static and fixed; whereas, the teacher-enhanced scaffolding was dynamic, changing to fit the needs and questions of each individual student. Although the tutoring script does seem less-dynamic than how a teacher would most likely scaffold his/her own students. Overall, the purpose of the scaffolding was to help with metacognition through regulating the students' information

problem solving processes. The researchers found that teacher-enhanced scaffolding has a significant impact on student comprehension and information problem solving. With female participants, the combination of technology-enhanced and teacher-enhanced scaffolding made the biggest difference. With male participants, the teacher-enhanced scaffolding increased their comprehension and problem solving, but the technology-enhanced scaffolding had the opposite effect. Researchers suspected that both types of scaffolding resulted in over-scripting for male participants. Students greatly lacking in prior knowledge benefited the most from the teacher's dynamic scaffolding. Students with high prior knowledge benefited from any of the conditions with any type of scaffolding equally. Interestingly, the technology-enhanced scaffolding improved students' metacognitive awareness more than the other conditions in the study.

Also examining reading comprehension strategies for online texts, Hsieh and Dwyer (2009) compared students who had an online rereading strategy with students who did not have an online rereading strategy. The researchers found that students in the group that was infused with the rereading strategy, via an online teleprompter, had significantly higher scores than students who did not have the online rereading strategy. Researchers also tested the key word strategy and question-answer strategy, but the students in the rereading strategy group far outperformed them. The rereading strategy resulted in deeper comprehension and connection with the text.

Similar to the IPIS-I-model, which supports online information problem-solving, Kymes (2005) highlights key areas that need to be priorities for readers of texts online. For example, Kymes explains that a student in the online environment must start with an awareness of purpose and skim, scan, and read selectively. In addition, it is very

important for teachers or scaffolding technology to activate prior knowledge and encourage students to maintain the dialectic and discover new meanings of words, similar to Kintsch's (1978) discussion of schema and (2004) findings with prior knowledge. Rereading and note-taking help with retention of key information, interpreting or paraphrasing text and conversing with the author, and evaluating text structure and quality. Kymes' key areas are more specific than the ISP-I-model by Brand-Gruwel et al. (2009), although both provide a framework that would help in-service and pre-service teachers understand how to teach comprehension online.

Digital technologies are more than just tools for many, as they often result in interactive communities and social spaces (Grabill & Hicks, 2005). Through blogging, synchronous online discussion and other interactive technologies, teachers have the ability to incorporate these modern technologies to develop students' multiliteracies and foster social communities of learning. Some researchers argue that teachers truly have the responsibility to implement these technologies, as they are increasingly becoming integral pieces in the world of communication (Grabill & Hicks, 2005; Unsworth, 2008).

Blogs, or weblogs, can be defined as, "websites that allow individuals to create personal webpages of text, pictures, graphics, videos, and other multimedia...provide a space where people can post comments and engage in online conversation," (Boling et al., 2008, p. 504). Blogs are one technology being implemented in some schools today. Researchers highlight the potential duality of blogs, as they are able to cover the basic needs of providing a standard English education as well as enable students to become more independent and creative thinkers.

The discourse of English class blogs is normative in that all students reflect English skills in their entries—evaluating characters, defending theories, and describing the process by which they read. At the same time, it is decidedly creative, challenging and changing what teachers, schools, and parents view as acceptable in school (West, 2008, p. 597).

In addition, encouraging students to participate in a type of learning that they consider enjoyable, results in what researchers describe as a sense of play (West, 2008). This sense of play lowers the emotional stakes of failing, allowing students to take more risks. Blogging gives students a chance to feel free to experiment with texts, and it encourages an endless realm of creativity for students (Boling et al., 2008; Rochette, 2007; West, 2008).

When Rochette (2007) incorporated blogging in the American Studies classroom, she found that student blogs seemed to reveal a “form of liberation” in the digital dimension (p. 47). The students’ blogs became a place where expanded thinking beyond the classroom walls occurred, and Rochette found this freedom resulted in stronger student voice and thoughtful connections with texts and artwork. Rochette (2007) also discusses implementing the SMART Board in the classroom, and by appealing to students’ visual and digital intelligences, Rochette (2007) found that she could better teach critical thinking and combine the visual with the written text for increased student engagement.

In order to help support students’ literacy learning, one researcher suggests the use of discussion boards with summer reading and book clubs (Jewell, 2005). Students who are more reluctant to read in isolation could feel more connected to reading with the

use of discussion boards. By engaging online with others who are reading the same texts, the reading experience can be more enjoyable for students. Also, by using an informal online community, students practice critical talk about literature in a non-threatening atmosphere (Groenke, 2008). Establishing a place for collaboration and community is something technologies are capable of offering students, extending the community beyond the traditional classroom walls. Students can choose to further discuss texts on their own time in a medium that engages them in active, relevant talk.

Groenke (2008) also discusses how computer-mediated communication (CMC) for both pre-service English teachers and middle school students can be a successful synchronous technology. In the study, the pre-service teachers and middle school students became web pen pals, using communication tools to customize a virtual educational space. For the pre-service teachers, the relationship with the middle school students was an opportunity to help prepare them for facilitating discussion about literature in the classroom. The web pen pals project also provided the pre-service teachers with a safe, non-threatening place to practice teaching and facilitating literature discussions with students where they could support them in reading comprehension. Groenke (2008) shows how relevant, content-focused teacher training with new technologies should begin with pre-service teachers. Groenke also discusses how pre-service teachers in the study had several valuable opportunities to engage students in critical talk regarding the novel; however, this development did not seem to happen. One pre-service teacher participant reflected on the missed opportunity, focusing on her lack of following up with student-initiated critical responses.

A missed opportunity with students is an example of how practice and reflection can greatly benefit both pre-service and current educators. Just as in the traditional classroom setting, teachers in an online setting need to include thoughtful and critical questions, and they need to be cognizant of students' critical responses in prompting further higher-level discussion of texts. As Groenke (2008) explains, some teachers feel it is risky to let students control discussions. It is important to question this attitude regarding power. We should stop to ask these teachers why they feel this way about student-led discussions. Where did their beliefs come from? This reaction to student control or involvement needs to be addressed with pre-service and current educators in order to create communities with critical talk and engagement. The online classroom can be a safe place that encourages risk taking for both students and teachers, as a voice of each individual is imperative for discussion to occur. This study is a reminder that virtual learning has the potential to be a powerful place where students are empowered to comprehend and discuss texts in a community.

Yi (2008) discusses the power of an online, student-led community that reinforces the skills we are teaching our students. Students feel free and excited to go to a place outside of school and communicate about writing and receive feedback from their peers. The out-of-school literacy practices of the adolescents show how rethinking authentic interaction can spark student interest in reading and writing. This study reminds us as educators that we need to understand the value of students' literacy experiences beyond the traditional classroom and encourage such opportunities. Researchers explain that we should take such creations of students, like student-led discussion boards and blogging, as

obvious cues for how to re-engage students in the English/language arts classroom (Grabill & Hicks, 2005; Yi, 2008).

In order to help prepare English teachers for the twenty-first century classroom, educators, both in-service and pre-service, need training and experience in the thoughtful implementation of digital technologies with pedagogical content and instruction. As Howland and Wedman (2004) discuss, faculty technology training must also move beyond simply teaching a tool in isolation and also move toward a process-driven model. The process-oriented perspective includes “an awareness of what the technology can offer, opportunity to explore technology integration, time to learn the technology, application of the technology to teaching, and reflection on teaching,” (p. 241). In order to effectively implement this process-oriented perspective, we must consider these researchers’ findings regarding the application of digital technologies to content area teaching. Through the focused application and the subsequent reflection, we can become more aware of what the infusion of various digital technologies can offer the English language arts classroom, and we can also understand how to better prepare English language arts teachers.

Chapter Three:

Research Context and Methods

My study, framed as a qualitative study with cases of focal students (Merriam, 2009; Stake, 2005), examined the technology preparedness and technology application of pre-service teachers during their practicum experiences in the field. These pre-service teachers were enrolled in a university located in the Midwest portion of the United States, where they were completing a semester-long practicum course for teaching secondary English/Language Arts. Specifically, my study followed a small group of pre-service teachers, who taught middle school students during their practicum experience, to address the research questions.

The comprehensive qualitative study record (Patton, 2002) provided a storied landscape for focused analysis. Consistent with Patton's (2002) description, this study record organized the "voluminous case data into a comprehensive, primary resource package" where pieces were "fitted together and the case record is organized for ready access either chronologically and/or topically," (p. 449). Data were coded, as Merriam (2009) describes, for emerging themes and differing perceptions within the survey, blog posts, focus group, and interview responses, as well as the provided pre-service teachers' artifacts from the field.

The Art of Case Study and Pre-Service Teacher "Portraits"

When discussing the study of cases, Stake (1995) highlights the researcher's desire to understand the cases, which in education are often people, and describes how the researcher seeks to understand the cases through hearing their stories. The case is "a bounded system" (Smith, 1978), an object of study that is specific, alive, functioning, and

complex. The case of study is a specific system that is functioning and integrated. Thus, Merriam (2009) defines a case study as “an in-depth description and analysis of a bounded system” (p. 40) where the researcher is interested in “insight, discovery, and interpretation rather than hypothesis testing” (p. 42).

For this study, qualitative study with cases of focal students was selected as the most appropriate methodology for exploring the research problem. Merriam explains how case studies are similar to other forms of qualitative research, as “qualitative case studies share with other forms of qualitative research the search for meaning and understanding, the researcher as the primary instrument of data collection and analysis, an inductive investigative strategy, and the end product being richly descriptive,” (Merriam, 2009, p. 39). Qualitative study methodology allowed me to thoughtfully examine the stories and experiences of the small group of focal cases and explore how a university teacher education program prepared these students to teach with technology.

Marshall and Rossman (2011) describe case study as “the most complex strategy,” as it “may entail multiple methods” (p. 94), and, for this study, the multiple methods provided me with rich insight to the stories of the focal cases. With the multiple cases of focal students, variables and complex situations, qualitative study proved to be the most relevant methodology for inquiry. As Merriam (2009) explains:

The case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon.

Anchored in real-life situations, the case study results in a rich and holistic account of a phenomenon. It offers insights and illuminates meanings that expand its readers’ experiences. These insights can be construed as tentative hypotheses

that help structure future research; hence, case study plays an important role in advancing a field's knowledge base (p. 51).

With this qualitative study, I aimed to better understand the focal cases' experiences as they navigated their journeys from education students at the university to novice teachers in the field and applied these insights to help frame future research and practice regarding the technology preparation of pre-service teachers.

As Merriam (2009) and Stake (1981) discuss, case study knowledge differs from other research knowledge in four key ways:

- More concrete—case study knowledge resonates with our own experience because it is more vivid, concrete, and sensory than abstract.
- More contextual—our experiences are rooted in context, as is knowledge in case studies. This knowledge is distinguishable from the abstract, formal knowledge derived from other research designs.
- More developed by reader interpretation—readers bring to a case study their own experience and understanding, which lead to generalizations when new data for the case are added to old data.
- Based more on reference populations determined by the reader—in generalizing as described above, readers have some population in mind. Thus, unlike traditional research, the reader participates in extending generalization to reference populations (Stake, 1981, pp. 35-36).

As a qualitative study with focal cases first begins with purposeful selection of the specific cases to be studied (Merriam, 2009), I chose to study the experiences of students within the university teacher education program and began with purposeful selection of

the focal students as samples at the start of my study. I considered the students' technological knowledge survey responses and the assigned practicum placements in order to choose a representative, balanced group of three students with varied technological knowledge. While enrolled in the same university program and the same practicum course, each of the selected focal students had different levels of technological knowledge as well as different placements within the local school district.

Since my study incorporates more than one focal case, it is a qualitative study with multiple cases, and Stake (2006) discusses the value of analyzing the multiple cases individually as well as collectively in qualitative research:

In multicase study research, the single case is of interest because it belongs to a particular collection of cases. The individual cases share a common characteristic or condition. The cases in the collection are somehow categorically bound together. They may be members of a group or examples of a phenomenon (pp. 5-6).

Merriam (2009) includes a discussion of how multicase qualitative studies naturally include more variation within the different cases, and the inclusion of more than one case results in enhanced external validity or generalizability of the findings:

The more cases included in a study, and the greater the variation across the cases, the more compelling an interpretation is likely to be . . . The inclusion of multiple cases is, in fact, a common strategy for enhancing the external validity or generalizability of your findings" (Merriam, 2009, pp. 49-50).

Qualitative methodology with focal cases also rests on the assumption that, through the researcher's account of the cases and the use of colorful narrative description

(Stake, 2005), the knowledge of each particular case is generalizable and transferrable. However, it is important to note that the readers will ultimately be the ones who determine how they respond to the stories, images, or “portraits” (Lightfoot, 1983) of the focal students. In addition, Stake (2005, p. 455) discusses how the researcher “will, like others, pass along to readers some of their personal meanings of events and relationships—and fail to pass along others. They know that the reader, too, will add and subtract, invent and shape—reconstructing the knowledge in ways that leave it . . . more likely to be personally useful.”

Methodology and Analysis

The focal students were enrolled in a university located in the Midwest portion of the United States, and, as English/Language Arts education students, they were enrolled in a semester-long practicum course for teaching secondary English/Language Arts. Specifically, my study followed a small group of pre-service teachers, as they taught middle school students during their practicum experience, to address the following research questions:

1. How well does a teacher education program prepare pre-service teachers’ construction of technological pedagogical content knowledge (TPACK)?
2. How do pre-service teachers apply their technology knowledge and skills to their experiences in the field?

University and Participants

This study examined the teacher education program and pre-service teachers’ experiences of a four-year Midwestern university. Students may apply to the university’s teacher education program after the successful completion of 31-35 credit hours of

designated general education courses. Six of those credit hours include English courses in composition, reading, and writing. Prior to admission, students may also complete some of the additional 40-41 credit hours of general education and content area requirements. For students in the secondary English education program, approximately 30 of those credit hours are English courses. In addition to the course requirements, to be considered for admission, students must also have a minimum overall GPA of 2.75 and passing scores on a pre-professional skills test that assesses reading, writing, and math skills. Semester one of the teacher education program begins the spring the student is admitted. Once admitted, students are required to complete 55 hours of teacher education courses and multiple field experiences during five semesters. These 55 hours of teacher education courses include one required three-hour course in educational technology.

The university's teacher education program is a fairly typical traditional teacher education program that includes approximately 40 credits of professional education coursework and approximately 33 credits of English content coursework for pre-service English teachers. Pre-service teachers typically take the educational technology course the year before the practicum.

Students engage in the practicum experience during their fourth semester. During the semester-long practicum course, English education students are assigned field placements in local middle and secondary schools. The students have cooperating teachers at their assigned placements, and they also receive guidance from the university's practicum supervisor. This supervised practicum allows the pre-service teachers to apply knowledge gained through the teacher education program, and the

practicum prepares them for the undergraduate student teaching experience, which takes place during the fifth and final semester of the program.

The practicum students are typically placed in the local Midwestern public school district, which includes four middle schools (grades 6-8), and two high schools (grades 9-12). In this study, the practicum students who were the focal student participants were assigned to middle school English classrooms. The local public school district enrolls over 11,000 students; 51.2% are male students and 48.8% are female students. The district reports that 70.5% of its students are white, 7.5% Hispanic, 7.1% African American, and 14.9% other. In addition, 35.4% of the district is considered economically disadvantaged. The district's recent sixth grade state assessment reading scores include the following: 40.1% exemplary, 28.4% exceeds standards, 22% meets standards, 5.2% approaches standards, and 2.9% academic warning.

During the first week of the practicum, there were 18 students enrolled in the university program's Advanced Teaching Practicum, and these students completed the TPACK survey (Schmidt et al., 2009) as shown in Appendix A. I analyzed the survey results, and I ultimately identified three participants as focal cases through purposeful selection. First, based on the TPACK survey results, I selected participants of varied technological knowledge backgrounds (low, medium, and high levels of proficiency in technological knowledge) to reflect the diverse levels of pre-service teachers within the teacher education program. Next, I identified three participants, including two female participants and one male participant, of varied technological knowledge who were also placed at different middle schools in order to better understand the varied classroom practicum experiences.

On their TPACK survey responses, all three pre-service teacher participants, Amy¹, Jill, and Mike, identified themselves as 18 to 22 year old college seniors, majoring in secondary English education. Each pre-service teacher had individual scores averaged for each of the TPACK components. For the technological knowledge component, the students responded to a series of technology knowledge prompts. Koehler and Mishra (2009) define technological knowledge as “the knowledge about various technologies, ranging from low-tech technologies such as pencil and paper to digital technologies such as the Internet, digital video, interactive, whiteboards, and software programs” (p. 125). Each focal student had different technological knowledge scores—Mike scored high, Jill scored in the middle, and Amy scored lowest. As Merriam (2009) discusses, the selection of focal cases with varied characteristics allows for a more representative sample and enhances transferability and generalization. I invited these three focal students to participate in the study and scheduled their initial interviews.

Methods of Data Collection

Throughout the fifteen weeks of the focal students’ semester-long practicum experience, I collected data through a variety of sources, including the following: the TPACK survey, individual interviews, blog posts, focus group, syllabus analysis, and classroom artifacts. In addition, all data collected for this study was compared with the relevant literature for triangulation, to help with credibility and reliability (Merriam, 2009).

During the first week of the practicum, I presented a brief background of my study and administered the TPACK survey. The survey was administered in order to

¹ Names of all research participants, schools, districts, and geographical locations have been changed throughout, and pre-service teachers were given pseudonyms.

collect information about the pre-service teachers, their program experiences, and individual perceptions of each facet of the TPACK framework (Mishra & Koehler, 2006). Informed by the TPACK survey results, which was administered the first week of the semester, I identified three participants as focal cases through purposeful selection. I selected participants of varied technology backgrounds (low to high levels of proficiency) to reflect the diverse levels of pre-service teachers within the teacher education program. Further, the three selected participants were each placed at different middle schools. As Merriam (2009) discusses, the selection of focal cases with varied characteristics allows for a more representative sample and enhances transferability and generalization.

Each focal student participated in two individual interviews; one initial interview at the beginning of the semester (during the third week of the semester), and one reflective interview at the end of the semester (during the fifteenth week of the semester). During the fifth week through the ninth week, I asked the participants to write brief individual weekly blog entries for the study. In addition to the focal students' blogging, during these weeks, I also collected the course syllabus from the focal cases' educational technology university instructor, conducted a syllabus analysis, and interviewed the identified university instructor. In addition, in the middle of the semester, I conducted a focus group with the three focal students and then individually interviewed the practicum supervisor. I requested classroom artifacts from the focal students and began artifact collection during the tenth week, and the focal students continued to send artifacts through week fourteen. Individual reflective interviews with the pre-service teachers occurred from weeks thirteen to fifteen. This qualitative study collected and analyzed data from the adapted TPACK survey, individual interviews (pre-service teacher focal

cases, educational technology university instructor, and university practicum supervisor), focus group of pre-service teacher focal cases, classroom technology blog, artifact collection, and educational technology course syllabus analysis.

Data Collected

TPACK Survey

A modified version of the TPACK survey (Schmidt et al., 2009) was administered during the first week of the semester. The purpose of the survey was to gather information about the pre-service teachers' program experiences and perceptions of each dimension of the TPACK framework (Mishra & Koehler, 2006). The TPACK survey collected demographic information about the participant and consists of questions or statements. Specifically, it began with seven items in the demographic section and contained 28 questions related to each of the following TPACK dimensions: technology knowledge (TK), content knowledge (CK), pedagogical knowledge (PK), pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK). It also included ten questions, items 29-38, which inquired about the participants' models of TPACK, and one question, item 39, asked participants to write about their own TPACK teaching experiences. For items 1-33, participants rated each one as strongly agree, agree, neither agree or disagree, disagree, or strongly disagree. For the three questions in which pre-service teachers rated their teacher education program, items 34-36, participants chose percentage responses of either 25% or less, 26%-50%, 51%-75%, 76%-100%. Finally, the survey included three open-ended questions in items 37-39, where participants were asked to describe their experiences in the teacher

education program. Since this study focused on the experiences of pre-service teachers in the English secondary education track, the TPACK dimension questions within the areas of social studies, science, and math content area teaching were removed.

Individual Interviews

I asked each participant a series of planned interview questions to collect data (see Appendix B). These individual, semi-structured interviews provided me with data regarding the participants' experiences and perspectives for deeper analysis. In addition, follow-up questions were asked in order to discover additional information and clarify concepts for further analysis, validating the participants' responses. The interviews and focus group were recorded and transcribed to aid in data analysis. As Rubin and Rubin (2012) explain, in-depth qualitative interviews provide a researcher with rich, detailed information through exploration of the interviewee's experiences, and they also allow for fluidity of the interviewer's questions and the interviewee's responses. The individual interviews were audio-recorded to allow for a detailed analysis. Interview questions for the focal students and practicum supervisors are included in Appendix B.

Focal Students. Each focal case was interviewed individually at the beginning and at the end of the semester. The purpose of the initial interview was to understand the focal students' perceptions of their technology preparation and skills, as well as the initial application to the field. The aim of the final interview was to understand the focal students' perceptions of their overall practicum experiences, their use of technology artifacts, and to elaborate on their blog posts. The individual interviews with the focal students lasted approximately forty-five minutes each.

Practicum Supervisor. I also interviewed the focal case students' practicum supervisor in the middle of the semester, after I had already initially interviewed the pre-service teachers. The practicum supervisor provided more information about how the pre-service teachers used technology to teach, and he also provided additional context to the pre-service teachers' responses. The individual interview with the practicum supervisor lasted forty-five minutes.

Focus Group

After analyzing each focal case's preliminary TPACK survey responses and completing the individual interviews, I met with the participants and conducted a focus group interview. The focus group was audio-recorded to allow for a detailed analysis. As Patton (2002) explains, the goal of the focus group was to record "high-quality data in a social context where people can consider their own views in the context of the views of others," (p. 386). The dynamic nature of a focus group in the middle of the semester allowed me to elicit additional focused topic areas for further examination. The focus group also provided deeper analysis of the participants' experiences, as it presented the participants with a common space where they could share their practicum and university teacher education program experiences individually and collectively. The focus group with the focal students lasted approximately 45-60 minutes.

Focal Student Blogs

Each focal student participated in writing and contributing to a classroom technology blog. The blog posts focused on how the focal students utilized technology in the classroom each week, and I asked the focal students to write one blog post for each week from weeks 5 through 9, during their practicum experience. The suggested length

of each blog entry was one to two paragraphs, although I found that the focal students often wrote lengthy blog posts. Students used the classroom technology blog to record their experiences with technology in the field.

When examining their blog posts, it became clear that the participants used this study's technology blog as a safe place to reflect on their experiences in the field, and they wrote longer, more emotional posts than I had anticipated. And while they often included reflections and accounts of technology application in the classroom, I found that the focal students used the blog space to write lengthy emotional posts about their frustrations and triumphs in the practicum classroom as well as forward-looking posts that incorporated their hopes and dreams for future teaching beyond the practicum. Jill and Mike each wrote four blog entries, and Amy wrote three blog entries. The focal students could also read each other's blog posts, and I noticed that, regardless of their placements and experiences, this study's technology blog became a supportive and collaborative space for the focal students.

Artifact Collection

Each focal student provided at least one classroom artifact that demonstrated how he/she integrated technology into the practicum experience. The focal students submitted a variety of classroom artifacts at the end of the practicum. Mike submitted sample student products and a collection of his lesson plans; Amy emailed links to her multimedia Prezi presentations, and Jill sent me a sample poetry writing assignment. As Merriam (2009) notes, an artifact may be fragmentary, yet it will be an authentic product that is "grounded in the real world" (p. 156). The collection of the focal students' classroom artifacts demonstrated how each of the focal cases incorporated technology in

their teaching practice, which provided additional insight regarding how the pre-service teachers applied what they learn in their teacher education program.

Syllabus Analysis and Faculty Interview

After identifying the faculty member who taught the required educational technology course to the focal students, I asked the faculty member, Dr. Williams, for a copy of the course syllabus. He emailed a copy of the syllabus to me, and I conducted a syllabus analysis where I investigated the inclusion of each construct of the TPACK framework within the assigned content and applied practice of the course. In order to gain a more comprehensive view of the technology application, I followed the syllabus review with an individual interview with Dr. Williams.

Data Analysis

Throughout the course of this qualitative study, I collected data from a modified TPACK survey (Schmidt et al., 2009), individual and focus group interviews, blog entries, artifacts from the field, education technology course syllabus, and university supervisor and faculty individual interviews. In addition, I compiled a list of notes in my research log and recorded my observations throughout my journey as the researcher.

This data allowed for a comprehensive study record (Patton, 2002) that has provided a storied landscape for focused analysis. Consistent with Patton's (2002) description, this qualitative study record organized the "voluminous case data into a comprehensive, primary resource package" where pieces were "fitted together and the case record is organized for ready access either chronologically and/or topically," (p. 449). Guided by the literature and the TPACK framework (Mishra & Koehler, 2006), data were coded, as Merriam (2009) describes, for emerging themes (e.g., field classroom

technology access and use, pre-service teacher and cooperating teacher attitudes toward classroom control and technology integration, university technology preparation and practice with content area and pedagogy, adaptability and the Millennial generation), and differing experiences within the survey, focus group, blog posts, and interview responses, as well as the provided pre-service teachers' artifacts from the field. I coded this data by marking the concepts, themes, examples, and topical markers and using subcategories through hierarchical coding when applicable (e.g., PowerPoint, SMART Board, and blogging integration within classroom technology access and use), as Rubin and Rubin (2012) discuss, in order to have an accurate and thick description. With this study, I explored the focal cases' experiences, university preparation, and technological knowledge application through qualitative study methodology "to bring about understanding that in turn can affect and perhaps even improve practice" (Merriam, 2009, p. 51).

Credibility and Trustworthiness

After briefly explaining the purpose of the study and my role as the researcher, I reviewed the human subjects consent form with the pre-service teachers. The form included the topic of the study, procedures, risks, benefits, and participant anonymity. I asked all of the participants if they had any questions. I asked each participant a series of planned interview questions to collect data (see Appendix B). These individual, semi-structured interviews provided me with data for analysis. In addition, follow-up questions were asked in order to discover additional information and clarify concepts for further analysis, validating the participants' responses. The interviews and focus group were recorded and transcribed to aid in data analysis. All of the interviews (pre-service

focal cases, university practicum supervisor, and university faculty) and the focus group were analyzed for discrepancies. In addition, all data collected for this study was compared with the relevant literature for triangulation, as this helps with credibility and reliability (Merriam, 2009).

With this qualitative study, I examined the focal participants' experiences as they navigated their journeys from education students at the university to novice teachers in the field and applied these insights to help frame future research and practice regarding the technology preparation of pre-service teachers. In the following chapter, I report the results.

Chapter Four:

Technology Infusion and The Journey of a New Teacher's Development

In an effort to help prepare pre-service teachers for teaching in the field, the university requires that pre-service teachers complete a semester-long practicum experience. For the practicum experience, pre-service teachers are placed in local schools where they work with cooperating teachers and engage in teaching. In some ways, the practicum experience serves as a precursor to student teaching, which takes place during the following semester. The practicum field placement serves as a safe, supportive environment, where each student can observe and engage in teaching in the field.

The practicum experience exposes pre-service teachers to the common challenges facing new teachers in the field, and it allows them to practice responding to those challenges. The journey from pre-service teacher to practicing teacher can often be a transformative one, and teaching is full of seemingly unpredictable challenges. When discussing this journey in my interview with the university supervisor of field experiences, Patrick, he discussed his observations and noted how difficult it is to prepare pre-service teachers for complex classroom teaching as they enter the field. He explained the following about the perceptions and attitudes of the pre-service teachers as they transition into teaching in the field:

It is a sort of a disposition that I don't think comes easily—that teaching isn't something you master as much as you get good at adapting to situations and using lots of different types of knowledge and strategies and developing that frame of

mind. Which I think is hard [for pre-service teachers to learn] because so much of their time has been spent with scenarios where there are answers to the questions, and there are best practices. Recognition that no classroom is so simple, and what may be best practice for one student might be different for another. Recognition of the complexity, I guess.

For pre-service teachers who have been taught best practices and perhaps bring with them a simplistic view of classroom teaching, the practicum experience in the field can be a pivotal one where they recognize and respond to the “complexity of teaching,” as Patrick described. The varied classroom access and dynamic nature of new digital technologies also adds to the complexity of pre-service teacher preparation and how they apply their technological knowledge to the field.

Teacher education programs have not consistently addressed the changing needs of pre-service teachers, including how to teach with digital technologies (Alger & Kopcha, 2009; Mishra & Koehler, 2006). Borko, Whitcomb, and Liston (2009) suggest that the inconsistent and cursory technology inclusion in teacher education programs is due to the complex and dynamic nature of the new digital technologies. Further, Mishra and Koehler (2008) claim that this dynamic nature of technologies presents teacher education with a “wicked problem,” (p. 2). As described by Rittel and Webber (1973), wicked problems occur in complex and unique social contexts and have a variety of possible solutions that are difficult to recognize because of interdependencies and contexts. The dynamic nature of these new technologies and the complexity of interdependent variables make it difficult for teacher education programs to consistently respond to the needs of the twenty-first century classroom teachers, and there is not a

simple, definitive solution (Borko et al., 2009; Koehler & Mishra, 2008). However, despite these challenges, teacher education programs must prepare pre-service teachers with the knowledge and skills to teach with digital technologies.

As Darling-Hammond (2006) analyzes twenty-first century teacher preparation, she highlights the need for cohesion and integration, bringing subject matter learning together with content pedagogy and incorporating cross-curricular connections. Recent research shows that while some teacher education programs are attempting to include technology tools on a somewhat cursory level, the tools are, at times, not included in a meaningful manner (Borko et al., 2009; Mishra & Koehler, 2006). Furthermore, little consistency can be found in how teacher education programs are integrating technology to prepare pre-service teachers (Archambault et al., 2010).

With this qualitative study, I analyze how well a teacher education program prepares pre-service English teachers' construction of technological pedagogical content knowledge, TPACK (Koehler & Mishra, 2009). In addition, I also investigate how the pre-service teachers apply their technological knowledge and skills to their experiences in the field.

As I analyzed data collected throughout this qualitative study, it became clear that how the pre-service teachers apply their technological knowledge and skills to the field is dependent upon three distinct factors: the technology available in the field placement classroom, the attitudes of the pre-service teachers and cooperating teachers toward classroom control and technology integration, and the cooperating teacher's ability to integrate technology in the classroom.

Furthermore, when given the opportunity to integrate technology in the field, the pre-service teachers discussed how the teacher education program's technology preparation included training for technology tool use; however, the technology tools practiced at the university were not yet available consistently in the field at the focal students' practicum placements. Throughout the semester-long practicum experience, the focal students discussed how they negotiated these differences in technology preparation, use, and attitudes.

The teacher education program attempts to prepare pre-service teachers for classroom technology integration by requiring all pre-service teachers complete an educational technology course, typically taken during their junior or senior year. However, during this practicum experience, the pre-service teachers in this qualitative study discovered that many of the university's technologies taught in the teacher education program were not always relevant to what was accessible in the local school district's classrooms.

Further, consistent with the literature, the pre-service teachers in this qualitative study revealed through their TPACK surveys, individual interviews, and blog entries that they felt that the teacher education program had provided more than sufficient technology tool training, yet they felt that they were not fully prepared to integrate the technology tools with the specific content area in a meaningful way. The emphasis on technology tool training often neglects to prepare pre-service teachers to thoughtfully integrate technology with their content areas in a meaningful manner (Borko et al., 2009; Mishra & Koehler, 2006).

Mishra and Koehler (2006) suggest a movement toward teaching technological pedagogical content knowledge (TPCK) to pre-service teachers, originally conceptualized as TPCK and now known as TPACK—technology, pedagogy, and content knowledge (Koehler & Mishra, 2009). These researchers expand on Shulman’s (1986) concept of pedagogical content knowledge (PCK) and aim to take traditional teacher education to the digital twenty-first century level. Mishra and Koehler’s (2006) TPACK has become a leading theory in the field, as it bridges Shulman’s (1986) conceptualization of PCK with technology. The literature also highlights that in order to effectively integrate TPACK in pre-service teacher education programs, universities should incorporate a modified framework that connects the concepts of the TPACK to specific content area courses within pre-service teacher education programs (Angeli & Valanides, 2009; Archambault & Crippen, 2009; Graham, 2011; Koehler & Mishra, 2009; Schmidt et al., 2009).

In addition, although adaptability is not included as its own distinct dimension of the TPACK framework, I found that the participants’ emphases on adapting were worth exploring further. In analyzing the TPACK survey, I found that the concept of “adapting” is integrated into question items listed in the pedagogical section of the TPACK survey. Due to the emergence of the concept of adaptability in the participants’ interview responses and blog posts, I also include an analysis of the focal students’ TPACK survey responses on these items specifically including the concept of “adapting.”

While all of the pre-service teachers in this qualitative study reported that they had taken the same educational technology course, each pre-service teacher was assigned a different field placement and cooperating teacher for the practicum experience.

Dependent upon their placements, the pre-service teachers encountered different levels of classroom technology access and use. In addition to varied classroom technology access, the attitudes of the pre-service teachers and cooperating teachers toward classroom control and technology integration and the cooperating teacher's ability to integrate technology also greatly affected the experiences of the pre-service teachers. The participants discussed these factors with me during their interviews throughout the semester-long practicum experience. The focal students also wrote about these factors in this study's technology blog posts throughout the practicum experience and discussed them further in the focus group interview.

As I analyzed data collected throughout this qualitative study, it became clear that how the pre-service teachers apply their technology knowledge and skills to the field is dependent upon the individual attitudes of the pre-service teachers and cooperating teachers toward classroom control and technology integration, the cooperating teacher's ability to integrate technology in the classroom, and the technology available in the field placement classroom.

In addition, throughout this study, it was evident that while a university teacher education program provided the focal students with a foundation for cursory technology integration, it did not consistently infuse technology with content area teaching, as suggested by the growing body of literature in support of cohesion and integrating technology with pedagogy and content area teaching (Abbitt, 2011; Archambault et al., 2010; Darling-Hammond, 2006; Graham, 2011; Koehler & Mishra, 2009; Schmidt et al., 2009). The focal students in this study reported learning a breadth of technology tool knowledge in the teacher education program, yet they noted a lack of depth regarding the

program's preparation of how to connect these technology tools in a meaningful way to teaching lessons in their content area.

The subsequent sections include a discussion of the focal students' technological knowledge and TPACK, followed by a discussion of adaptability and the Millennial generation. Then, I include a discussion of the pre-service teacher's and cooperating teacher's attitudes toward classroom control and technology integration and the cooperating teacher's ability to integrate technology in the classroom. Next, I highlight the individual journeys of this study's three focal students as they enter the field, and I examine their classroom technology access and how they apply their technology knowledge and skills to the field. Finally, following the focal students' journeys, I include a discussion regarding how well a university teacher education program has prepared these pre-service English teachers' construction of TPACK. Furthermore, I begin a discussion of the implications of this study and directions of future research in technology infusion and pre-service teacher preparation.

Focal Students and the TPACK Framework

A modified version of the TPACK survey (Schmidt et al., 2009) was administered during the first week of the semester to gather information about the pre-service teachers' program experiences and perceptions of each dimension of the TPACK framework (Mishra & Koehler, 2006). Each pre-service teacher had individual scores averaged for each of the TPACK components.

For the technological knowledge component, the students responded to a series of technology knowledge prompts such as "I know how to solve my own technical problems," "I frequently play around the technology," and "I have the technical skills I

need to use technology.” Koehler and Mishra (2009) define technological knowledge as “the knowledge about various technologies, ranging from low-tech technologies such as pencil and paper to digital technologies such as the Internet, digital video, interactive, whiteboards, and software programs” (p. 125). Each focal student had different technological knowledge scores—Mike scored high, Jill scored in the middle, and Amy scored lowest (see Figure 2).

The pre-service teachers’ technological knowledge scores highlighted the differences in how the pre-service teachers perceive their technology skills and technology awareness. Mike perceived that he had a high level of technology knowledge and reported feeling confident that he can learn technology easily, solve technical problems, and play around with the technology. While Jill responded confidently that she knows how to solve her own technical problems, can learn new technology easily, and has the technology skills she needs to use technology, she also responded less confidently when asked if she keeps up with important new technologies and frequently plays around with the technology. Jill also reported that she felt that she did not know about a lot of different technologies. And while Amy responded confidently to knowing how to solve her own technical problems, learning technology easily, and knowing about a lot of different technologies, she also reported that she does not frequently play around the technology or keep up with new technologies.

The varied technological knowledge responses of the pre-service teachers show how, as research shows, we cannot assume that millennial pre-service teachers feel technologically knowledgeable (Abbitt, 2011). Further, it is also important to note the gender differences in the focal students’ technological knowledge responses and scores.

Mike, the only male focal student, scored the highest in perceived technological knowledge, revealing a higher level of self-efficacy with technology. This is similar to the findings of researchers who discuss a clear hierarchical structure of gendered relations of perceived technological knowledge and power, although more research is needed to further explore the gendered relations (Abbiss, 2011; Padilla-Melendez et al., 2013).

Initial research on gender and technology focused on the Technology Acceptance Model (TAM) (Davis, 1989) and the gender differences when applying the model to technology use in the classroom. The TAM model, inspired by theoretical components of the Theory of Reasoned Action (Fishbein & Ajzen, 1975), claims that the dimensions of technology use are influenced by systems design features, perceived usefulness, perceived ease of use, attitude toward using, and use (Davis, 1989). Subsequently, educational researchers proposed the addition of extrinsic and intrinsic motivation to the TAM model (Padilla-Melendez et al., 2013). Perceived usefulness and ease of use have been suggested as extrinsic motivators, and playfulness, flow, and enjoyment have been discussed as intrinsic motivators (Lee, Cheung, & Chen, 2005). In relating the TAM model to learning and the motivators of learning, researchers have focused on the role of gender with TAM, and their results provide insights regarding effective technology in the classroom (Chou et al., 2011; Padilla-Melendez et al., 2013; Terzis & Economides, 2011).

Padilla-Melendez et al. (2013) found gender differences in undergraduate students' attitudes toward technology, specifically regarding perceived playfulness and perceived usefulness of technology. Further, Abbiss (2011) found that students believed that male students are more interested in computer gaming, programming, and software,

and female students are more interested in document production and aesthetic design. Consistent with the literature, the female focal students in this study did not report much “playfulness” with technology and generally responded lower on the items related to perceived technological knowledge when compared to Mike’s responses.

Figure 2. Table of Focal Students’ Technological Knowledge and Adaptability

	Technological Knowledge	Adaptability
Mike	High	Low
Jill	Medium	High
Amy	Low	High

As discussed further in this chapter, in addition to scoring higher in technological knowledge when compared to the female focal students, Mike’s perceptions of his own technological knowledge were also more positive when compared to his negative perceptions of his female cooperating teacher’s technological knowledge. This difference in perceived technological knowledge contributed to Mike’s practicum experience, which he often referred to as a “frustrating” practicum experience.

Regarding technological knowledge and self-efficacy beliefs, Abbitt’s (2011) study revealed that using the TPACK framework in pre-service teacher education resulted in increased self-efficacy beliefs for pre-service teachers, specifically within the knowledge domain. Further, the study found that this relationship between knowledge and increased self-efficacy was most apparent when knowledge was blended with technology in the technological pedagogical knowledge (TPK), technological content

knowledge (TCK), and technological pedagogical content knowledge (TPCK) domains when compared to the technology-absent pedagogical knowledge (PK) and content knowledge (CK) (Abbitt, 2011). This relationship and the focal students' technological knowledge scores highlight the importance of using a guiding, multidimensional framework for technology infusion, similar to TPACK, in teacher education programs to increase self-efficacy and help prepare pre-service teachers for effective classroom technology integration.

In examining the educational technology course syllabus for components of the TPACK framework, as received from the focal students' university instructor, Dr. Williams, I noted how the course is intended for students of all content areas in middle/secondary education. The course description included the following:

This course will focus on the use and integration of various educational technology tools in the middle/secondary classroom setting. Student will get hands-on experience with a variety of educational and information technologies, such as Web publishing, movies, podcast, and eBook, and learn how to use them in developing technology-enriched learning materials.

It was clear that the course enrolled a variety of students from different content areas and provided these students with digital technology tool training.

The syllabus also included the educational technology course meeting times, two 75-minute classes each week. The course requirements section also explained that students needed to have "access to both PC and Mac since some software (e.g., iWeb, GarageBand and iBooks Author) is available only on Mac." This provided more specific information on the specific applications taught in the course, and it was consistent with

the focal students' responses on their program technology preparation, as discussed further in the profiles of their individual journeys.

In the schedule section, the course topics listed included the following: Web Publishing I, II, III; Digital Images I, II; Image Map; Movies I, II; eBook I, II; Interactive White Board I, II; Podcast I, II. Throughout the course topics on the tentative schedule, there were one to three work day(s) for each topic's activity or assignment. The course's six listed assignments included the following: web publishing assignment, image map assignment, educational movie assignment, eBook assignment, interactive white board assignment, and podcast assignment.

Dr. Williams, the faculty member who taught the educational technology course to the focal students and provided the syllabus for review, explained to me the difficulties of teaching the educational technology course content. He discussed why he would typically teach technology tools as opposed to teaching content area teaching with technology:

Although it is ideal to teach technology tools in the context of teaching specific content knowledge, that is not what I do in my educational technology course. There are several practical reasons that make it difficult to teach technology tools in the context of teaching specific content knowledge in the educational technology course. First of all, in my educational technology class, I have students majoring in English, social studies, mathematics, and science. Therefore, it is not possible to teach technology tools in the context of teaching specific content knowledge. For example, if I teach a technology tool for pre-service mathematics teachers, other students not in the mathematics area will be very

unhappy about it. Due to this reason, my course is focusing on the general educational and informational technology tools that can be used in any kinds of subject domains, such as web publishing, educational movie, creating an eBook, developing a lesson plan utilizing an interactive whiteboard.

In this response, while Dr. Williams stated how it is “ideal” to teach technology within the context of content area teaching, he also noted how it is difficult and impractical to teach technology tools within content areas when he has students of various content areas enrolled in the same educational technology course. However, he also continued this discussion and explained how he does encourage students to incorporate their content areas with technology in the following response to me:

Although I did not teach those information/technology tools in the context of teaching specific content knowledge, I encourage my students to create technology products that can be used in the student teaching and field experience. I am also trying to work together [with] other faculty in the teacher education program to make technology products students are creating in my course useful in other methods courses. For example, when I teach elementary education students, they create eBooks that will be used in the social studies method course.

Dr. Williams explained that he does not think it is difficult to teach technology because of the dynamic nature of technology, “but because of the culture of the college/school of education and K-12 schools. I found the goal of many students in my educational technology course is to get technology projects done rather than to learn technologies used in the projects.” He also added the following about the pre-service teachers only taking one educational technology course:

In order to make students learn the technology, having them take one ed tech course is not enough. They should use technology throughout the teacher education program, which will help them master the technology. Once they master one technology, it would not be difficult to learn and use new technologies in the future because knowledge is transferable. In order for this to happen, students should try to learn the technology, rather than trying to get the projects done. I truly believe the culture of teacher education and public education should change.

As Dr. Williams highlighted the transferability of knowledge, researchers also similarly discuss that teachers must be able to transfer and ultimately adapt their instructional practices to the changing dimensions within classrooms and remain open to exploring different possibilities of curricular design, including technology integration (Kajder, 2004; Rochette, 2007). This process should begin with the pre-service teacher during their teacher education program.

Furthermore, it is worthwhile to note that while the pre-service teachers perceived the teacher preparation program and the educational technology course to be less effective in preparing them for technology classroom infusion, all of the pre-service teachers in this study identified adaptability as a crucial factor in transitioning from student to teacher in the field. In fact, all of this study's participants, including the university supervisor and faculty member, highlighted the importance of adaptability in their discussions with me. At times, the participants included a discussion of adaptability in the context of the ever-changing digital technologies, but, at other times, adaptability

was discussed as a key characteristic of effective teachers within any classroom environment.

Adaptability and the Millennial Teacher

As I collected the TPACK surveys early in the semester, one pre-service teacher explained how she thinks the ability to adapt is necessary for this generation of new teachers, “Adaptability—I think that our generation will be known for it.” I jotted this down in my notes that day and later realized just how profound that comment had been.

Researchers have examined this generation of “Millennials,” also known as Generation Y, which includes the pre-service teachers in this study. Millennials, born between the early 1980s and the early 2000s, have been characterized as individuals who have only known a world with digital technology, Internet, and instant communication. However, as Rodriguez and Hallman (2013) discuss, it is important to acknowledge and understand the reciprocal relationship between an individual’s “learner biography” (Alsup, 2006) and “generational ethos” (Howe & Strauss, 2000) in order to avoid essentializing the traits of a generation. Rodriguez and Hallman (2013) describe Millennials as “shape-shifting portfolio people” (Gee, 2004) who continually adapt and shape-shift “in response to rapidly changing technologies, literacies, economies—the ability to learn, unlearn, and relearn, and their ‘portfolio’ is comprised of skills, experiences, and abilities” (Rodriguez & Hallman, 2013, p. 66).

This practice of shape-shifting allows the pre-service teachers of the Millennial generation to adapt their portfolios and become more marketable as workers in “New Times,” (Gee, 2000; Luke & Elkins, 1998; Rodriguez & Hallman, 2013). The dynamic

nature of technological, social, and economic changes has affected the Millennials' perspectives in changing times, and Millennials have responded by cultivating a protective armor of adaptability. It is clear that the focal students, university supervisor, and faculty member viewed adaptability as a necessary feature of a pre-service teacher in the twenty-first century classroom.

All of the participants in this study mentioned the importance of adaptability to me, and I noticed the inclusion of adaptability with my initial individual interviews with the pre-service teachers. Jill, Mike, and Amy each independently discussed the importance of adaptability and often described it as a necessary component regarding technology integration in classroom teaching. When discussing adaptability, the study's participants were typically referring to the ability to effectively respond to the unpredictable challenges in the dynamic field classroom environment. Further, the participants also mentioned adaptability when discussing how to integrate new digital technologies to curricula while also responding to classroom management demands.

For adaptability, I examined the focal students' responses to the TPACK survey items that included a reference to the concept of "adapting." Two of these related to the "PK" of TPACK—the pedagogical knowledge context of the framework, absent of technology—and they included item 11, "I can adapt my teaching based-upon what students currently understand or do not understand," and item 12, "I can adapt my teaching style to different learners," in the pedagogical knowledge component. Also included in adaptability is item 23 within the "TPK" of TPACK—the technological pedagogical knowledge context of the framework—"I can adapt the use of the

technologies that I am learning about to different teaching activities,” in the technological pedagogical knowledge component.

For the prompts that included references to adaptability, I analyzed the pre-service teachers’ responses and found that Amy and Jill’s responses resulted in the same high score, while Mike had the lower score for adaptability. Although Amy and Jill did not score as high as Mike on perceived technological knowledge, their perceived adaptability may have affected their attitudes toward the practicum experience and how they integrated technology. As discussed further in this chapter, in their interviews and blog posts, Amy and Jill both reported having more positive relationships with their cooperating teachers, and they felt that they were able to include relevant technology; whereas, Mike repeatedly highlighted his frustrations with the available technology and often noted a challenging relationship with his assigned cooperating teacher. These relationships are discussed further in the following sections.

Attitudes, Control, and Technology Integration

How do the attitudes of the practicum cooperating teacher and the pre-service teacher affect how the pre-service teacher integrates technology in the practicum classroom? Throughout this study, as discussed further in my accounts of the focal student’s individual journeys, it became clear to me that the cooperating teachers’ and pre-service teachers’ attitudes toward classroom control and technology integration affected the experiences and technology infusion of the pre-service teachers during the practicum. In addition, the cooperating teacher’s ability to integrate technology also affected the experiences of the pre-service teachers during the practicum.

During the focus group, which occurred during the middle of the practicum semester, I met with the three focal pre-service teachers, and we discussed their practicum experiences. When I asked the pre-service teachers to tell me about the practicum experience so far, the pre-service teachers responded with the following:

Amy: Going really great, having a great experience, teaching a lot . . . I taught the last three to four weeks . . . I'm starting to wrap-up.

Mike: I get a lot of interactions with the students through extracurricular stuff.

Jill: My role is more of a teacher-assistant right now. Sometimes I start the class, then she delivers the main lesson, then when they're working, I'll go around and help them.

Immediately, I realized the stark differences between the pre-service teachers' responses regarding their experiences during the practicum. It was mid-semester, yet only one pre-service teacher, Amy, referred to what she did during the practicum as "teaching." Jill's discussion of being "more of a teacher-assistant" showed that she has had some opportunities to start lessons and support the cooperating teacher and students. However, Mike's response that he has had student interactions through "extracurricular stuff" seemed the least teaching-related. Mike's response also reflected the power struggle that he was encountering with his cooperating teacher and discussed in his interviews and technology blog posts. After coding and reviewing data, I found that these responses, while brief, succinctly revealed the degree to which the pre-service teachers applied their technology knowledge and skills to the field during their practicum placements.

During his interviews, the focus group, and technology blog posts, Mike discussed how he felt “frustrated” by the attitudes and teaching practice of his cooperating teacher, Kim. His experience is detailed in more depth in his pre-service teacher profile section where I include my account of Mike’s practicum journey, but his attitude toward classroom control and conflicting attitude with his cooperating teacher’s perceived technology integration are worth discussing in this section.

In his initial interview with me, he explained that ineffective technology in the English classroom includes when “[teachers] have two and a half months of PowerPoints on the six traits of writing, like my cooperating teacher has had.” He continued to explain his thoughts on effective versus ineffective teaching and technology use in the English classroom, and he mentioned his cooperating teacher once again:

The students should be practicing their writing. Students can do live writes and other cool stuff. And PowerPoints—day after day after day—we want to use technology to enhance student engagement, but they are using it to further distance the teacher at the front of the classroom. With a PowerPoint, “Hey, look at this! Write this down as I’m speaking to you.” I think that’s an abuse of the technology—almost everyday has been the teacher using the PowerPoint with bullets and lists of the six traits of writing.

Throughout his interviews and blog posts, Mike made it clear that he perceived his cooperating teacher’s PowerPoint presentations as ineffective technology use. Rather than integrating PowerPoint in a thoughtful, meaningful way, Mike’s cooperating teacher relied on the presentation program to present basic information and concepts each day. This, along with a lack of teaching autonomy, irritated Mike, who scored the highest of

the three focal students in perceived technological knowledge and described himself as “advanced” in technology. Mike, who also scored lower on adaptability when compared to the other focal students, viewed his cooperating teacher’s use of technology as repetitive and as a weak attempt to incorporate technology on a cursory level.

Mike described in a mid-semester blog post that his “lack of interaction with technology has become cumbersome.” He continued to explain this frustration with the following blog reflection:

There’s only so much excitement in a classroom that does basically the same thing every day. My clinical supervisor is great at what she does, as evidenced by the high level of achievement of her students, and has a system down, and I fully realize that as a practicum student, I must find a place within that system. Still, in recent days, it has seemed that not only my desire to incorporate relevant technology (emphasis on the word “relevant”) but even my ability to teach the unit has been swept under the rug of her short story unit. In short, I feel that I have a lot of ideas to try with technology while still in a sheltered university setting, but not a lot of opportunities.

In his reflective interview, Mike stated that his cooperating teacher “kept trying to run the show.” As for technology, he explained how he and his cooperating teacher simply viewed technology integration differently, “She doesn’t use technology very much unless it’s a PowerPoint [presentation] or showing a video, which at this point I would not classify as technology use.” Through talking with Mike and reading his blog posts, it became clear that he was so frustrated with his cooperating teacher that he

seemed to respond negatively to the practicum experience as a whole, feeling helpless in integrating the types of activities and technology that he had hoped to include.

How does a pre-service teacher in a conflicting position similar to Mike's respond to this type of frustration with the cooperating teacher? Not very well, according to the university practicum supervisor, Patrick. Patrick explained that the response to such frustration depends on if the pre-service teacher has been given what he describes as "the freedom to experiment." During my interview with Patrick, he explained how control, more specifically the loss of control, plays a critical role in the pre-service teacher's practicum experience.

Patrick explained to me in his interview, "The thing that impacts them [pre-service teachers] the most is the degree to which their cooperating teacher is willing to let go of control and allow them to experiment." He discussed the differences between cooperating teachers and noted the power of a cooperating teacher who is open to new ideas. He described this as the following:

. . . That openness to someone doing things differently, not necessarily that the goals of the lesson need to be different, but that openness to allowing the pre-service teacher to meet those goals in a way that the cooperating teacher has not thought of . . . just whether or not the cooperating teacher wants a carbon copy of him or herself or if they [cooperating teacher] are willing to let the person [pre-service teacher] experiment to figure out what kind of a teacher they are going to be.

As Patrick described how this "openness" of the cooperating teacher's attitude affects the experiences of the pre-service teachers, he also explained that it includes a willingness of

the cooperating teacher to allow pre-service teacher experimentation to occur in the classroom.

This discussion reminded me of Petko (2012) who explains that there is a multidimensional relationship between a teacher's "will, skill, and tool" when incorporating technology. Petko's findings explain why there are teachers who have unused interactive whiteboards and technology tools in their classrooms. Beyond actually having the basic skills and training, for successful technology implementation to occur in the classroom, teachers must individually believe in the positive possibilities of technology for student learning, and they must also personally perceive themselves as competent with the new digital technology (Petko, 2012).

As Rowley et al. (2005) discuss, university students with instructors who are supportive of integrating a new technology report having a more positive experience with the technology when compared with students of unsupportive instructors. This highlights the need to further research teacher and faculty attitudes and the "will" piece of the Petko (2012) model. According to Mike, not only did his cooperating teacher not want to relinquish control, but she also lacked the motivation to incorporate any different technology, beyond PowerPoint presentations, in a meaningful manner. When Mike suggested trying a new technology, his cooperating teacher was not supportive. This left Mike feeling discouraged that he was unable to lead the class or experiment with other types of technology. Mike also began to attribute this negative experience to his cooperating teacher's desire to maintain control, as well as a lack of technological knowledge.

University supervisor, Patrick discussed how the pre-service teacher might react to a cooperating teacher like Mike's, who is not willing to give up control and/or incorporate technology. He explained how the issue is not just the cooperating teacher's attitude that simply shuts down a new teaching idea, but ultimately, the experience also hinges on how the pre-service teacher reacts to the cooperating teacher's attitude.

Jane: How do you think that placement and classroom factors have affected the pre-service teachers' experiences?

Patrick: I definitely think that there is a little frustration with the pre-service teachers that exists if they are not given the freedom to experiment. Even when the cooperating teacher might have a lot of good things that the pre-service teacher can learn from there, if that trust has not been setup there, that they can experiment, even if there were something really good to learn from the cooperating teacher, they are probably not going to learn it because they are so frustrated at the loss of control. And so they feel like their cooperating teacher is obsolete. When we talk about technology, if they say there are these things I'd like to do with technology, but the cooperating teacher says I'd prefer you do it my way, immediately for the pre-service teacher they are thinking this person is stuck in the Stone Age. So they are thinking everything else you tell me is from the Stone Age, too.

Jane: How do you respond to that?

Patrick: That is something I struggle with quite a lot with them across the board. I think a lot of times they come out of their coursework from college thinking they know, between that and the fact that they have now spent 16 years of their

lives in classrooms—the apprenticeship of observation. They come in thinking that they really know how to do this. So getting pre-service teachers to realize that how little they really know and that teaching is super complex. So there are, everyday, there are probably going to be new situations. What works one day won't work the next day and just look at every interaction you have in a school as a possible learning experience. It kind of puts to them that if they're doing their job well, that won't change even if they've been in the classroom for 40 years.

They are going to have to do that same learning process everyday.

Patrick continued to describe the result of the loss of control and how this loss of control or power results in the loss of a potential learning opportunity. In addition, he explained how it continues to affect how the pre-service teacher perceives the cooperating teacher and his/her teaching practices. This seemed very true for Mike during his practicum experience.

In contrast to Mike's experience with his cooperating teacher, Amy often discussed the high level of freedom she had to experiment in her cooperating teacher's classroom, and Jill reported some freedom to experiment in her cooperating teacher's classroom. Further discussion of the pre-service teacher/cooperating teacher attitudes, control and technology integration continues within each of the following in-depth profiles of the pre-service teachers' journeys.

Jill's Journey

During my initial interview with pre-service teacher Jill, she described herself as “one of those people that likes working from a book and having a physical copy of

things.” In her TPACK survey responses, Jill’s results indicated a mid-level of technology proficiency and a high level of adaptability when compared with her classmates. In my communications with Jill, she would often note that she preferred the more traditional means of reading paper books, but she also noted several benefits of incorporating technology. In my initial interview with Jill, she explained her belief that teachers need to use technology because it is such a large part of the students’ lives:

You have to be willing to use technology even if it’s not your favorite thing because it’s going to be a part of their lives. And it’s already more a part of their lives than it is of my life. And it’s something they’re going to be growing up with. So it’s hard to just ignore it and pretend it’s not happening when they spend more time on Twitter than they do reading books, so you have to figure out ways to work that in and use that somehow.

Jill’s response showed how she believes that pre-service teachers need to incorporate technology regardless of how they feel about integrating it. According to Jill, technology is a necessary component of teaching, and, for the students, technology is a necessary component of their daily lives. Consistent with the literature, Jill also described technology as a viable avenue that teachers should explore in order to make learning more meaningful to this generation of digital students (Archambault et al., 2010; Rowley, Dysart, & Arnold, 2005; Unsworth, 2008).

It’s also important to note Jill’s lower expectations for technology integration at the start of her practicum experience. When I first talked with Jill during her initial interview, she stressed that she hoped to have “regular access to computers.” She explained:

. . . since I'm teaching English, and especially at the seventh grade level there are a lot of papers to write. It's important for the students' writing assignments.

Anything else on top of that would be great to work in, but mainly having access to word processors and the Internet for writing assignments.

I was struck by Jill's "hope" for computers and Internet, as this seemed to be an assumed expectation of the other pre-service teachers in this study. Jill's hope was a reality, as her cooperating teacher at Pathways Middle School regularly integrated the school's shared laptop cart and/or computer lab for the students' writing assignments. In her initial interview, she explained the available technology:

Jane: What types of technology have you seen your cooperating teacher and/or students use?

Jill: They do have a computer cart that is in the room most of the time, so they are able to use those most of the time almost everyday. My cooperating teacher also has an overhead [projector] and uses it to demonstrate online usage and various websites and computer things. They also have been able to use music as part of their presentations through the computers they have on the cart as well. That's about it.

Jill's students were able to access computers with Internet access daily, and her cooperating teacher consistently integrated computers and online activities throughout the practicum experience. Jill often responded positively to the technology infusion at her practicum placement, and she discussed online writing and she described the potential of online texts.

Jill explained in her initial interview with me, her practicum placement's class was "specifically devoted to writing," but she thought online texts would be helpful when she teaches reading in the future:

Not necessarily to replace the main paper text, but just to have a few vacant ones online. You can't always have the students write in the schoolbook and mark them up anyway. But if you're using an online text, it is easier to find the main points and highlight and make little notes that are legible.

I initially noted how Jill's discussion of online texts showed how she believed online texts and "easier" for locating main points and annotating. This belief may be part of her learner biography and/or technological background as a Millennial, yet the literature shows a much more complex picture of online reading comprehension.

As researchers explain, the online world has the potential to be a highly engaging source of learning, but the multi-dimensional aspect of the text, pictures, and links can become problematic with comprehension. It is apparent that students need assistance in navigating through the overwhelming mode to truly comprehend it and find relevant meaning (Brand-Gruwel et al., 2009; Hsieh & Dwyer, 2009; Petko, 2005; Raes et al., 2012). Similar to traditional comprehension issues and research, the technology-oriented research focuses on the application of teaching strategies including scaffolding (computer/technology scaffolding and teacher scaffolding), rereading strategy, and think-alouds to assist in student learning.

Jill also discussed online texts during my reflective interview with her, but by the end of the practicum experience, she not only discussed the benefits of online texts, she also described how to differentiate online texts depending on individual student's

strengths and needs, showing her growth in understanding the complexities of teaching in the field:

Jane: When do you think technology can be used effectively in the English classroom?

Jill: I think if you've got access to the interactive version of the text, that's a great way to use it. The problem is [that] it's hard to get those. To have basically like a Wikipedia article setup where there's stuff embedded in the text. If you click on a word, you can look up the dictionary definition right there. Because most students will be like too lazy if they don't know where to actually look it up, but if they have something where they can just hover over it, and it appears, that can help a lot. Same thing with interactive footnotes and explain more links if it talks about cultural events, and you can navigate it in the way that you navigate the Internet and have it be much simpler, and you can have a deeper understanding of the text, but that would be my ideal envisioning for it. But at the same time, I know there are students who that wouldn't work for at all because they would get so distracted by everything on there. It depends on the students I guess.

Jane: So how would you accommodate the different student needs?

Jill: Maybe if you have a plain text, but it's all still there, just less apparent. Or if it just has a search bar or a glossary where you have to go to it separately but still simple to access—just not as in your face—that may be better for those students. Or maybe an option to take notes or put margin notes on your computer because I think that's an easier and faster way to write out questions or thoughts they had. It's hard to teach annotation . . . but if you've got a little thing, a kind of note you

can put in, they will be more likely to type it out instead of going through the process of writing a whole paragraph on the side of the book.

As Jill also discussed with me throughout the practicum, she discovered that her middle school students gravitated toward the personalized, interactive, and social aspects of digital technologies. Digital technologies are more than just tools for many, as they often result in interactive communities and social spaces (Grabill & Hicks, 2005). In addition, classrooms are attempting to fuse newer technologies like blogs and learning management platforms to increase student comprehension and build student skills with new technologies (Baker & Labbo, 2007; Rowley, Dysard, & Arnold, 2005; Stevens & Brown, 2011).

Through blogging, synchronous online discussion and other interactive technologies, teachers have the ability to incorporate these modern technologies to develop students' multiliteracies. Some researchers argue that teachers truly have the responsibility to implement these technologies, as they are increasingly becoming integral pieces in the world of communication (Grabill & Hicks, 2005; Unsworth, 2008).

Early during the practicum experience, Jill showed enthusiasm for the regular classroom blogging assignments that students completed at her placement. Blogs, or weblogs, are defined by Boling et al. (2008) as "websites that allow individuals to create personal webpages of text, pictures, graphics, videos, and other multimedia... a space where people can post comments and engage in online conversation," (p. 504).

Researchers highlight the potential duality of blogs, as they are able to cover the basic needs of providing a standard English education as well as enable students to become more independent and creative thinkers:

The discourse of English class blogs is normative in that all students reflect English skills in their entries—evaluating characters, defending theories, and describing the process by which they read. At the same time, it is decidedly creative, challenging and changing what teachers, schools, and parents view as acceptable in school (West, 2008, p. 597)

Jill often referred to the blogging assignments as “fun,” and she often stressed the increased student engagement with them. Jill eagerly described the blogging to me during her initial interview:

They have regular blogging assignments that they have to do. They usually have to write a summary about an essay that they’re writing about or something like that, and then she has them comment on a couple other people’s blogs. And they seem to really like that. And usually it’s something kind of at the end of our main activity, and that’s when she’ll say something like, ‘OK, now you can go on someone’s blog you like.’ And it’s fun. And they’ll be like, ‘Oh, I’m on Micah’s blog, and he’s talking about this game he likes, and I left a comment for him.’ And they get very into it.

Jill often noted how students used the blogs consistently as an outlet for student writing, reflection, and interaction, both in and out of the classroom. She also wrote about her students’ blogging in her own blog posts for this study’s pre-service teacher technology blog. In her first blog post, Jill wrote the following:

This week, technology was absolutely critical for my 7th-grade practicum class. The students frequently use laptops, often completing assignments on GoogleDocs and sharing them with their teacher to be graded. Each student also has a blog (as

part of a closed group that the teacher moderates). Most of this week was spent sharing students' comparison/contrast essays that were published to their blogs. They were required to also post two pictures (at least) and were challenged to insert hyperlinks as well. Every day, a few students' essays were projected from the computer at the teacher's desk and students chose portions to read aloud. While they did so, the students in the audience posted comments about the essays' strengths. Afterwards, brief class discussions were held to promote vocal conversation about texts as well. The students loved seeing who could comment first, who came up with the funniest comments, etc., and their teacher loved it when they referenced the six traits or specific phrases to praise!

Jill's excitement for her students' blogging experience was also apparent during this study's pre-service teacher focus group. During the focus group, Jill highlighted the students' positive attitude toward blogging:

With the blog site, since she [cooperating teacher] uses that all the time, it really helps setup a good classroom culture. Like writing is cool, [the students] think writing is a thing that people like to do. They like sharing their writing, especially when it's online and they can go and access other people's blogs when they are home or whatever . . . And then they will come in and be like, 'Hey, I really liked your blog, good job! I really like the [NFL team] too!' or whatever it is, because they are allowed to talk about their own interests and it gets them excited and feeling good about writing. It doesn't feel like a big paper that might be daunting to some of them. It feels like something they can all do.

After hearing this during the focus group, Mike discussed his thoughts on Jill's classroom's blog and added:

I'd like to have more out of class writing where they can share and go further than where we go in class, like the blog thing Jill was talking about . . . And having students work on those projects outside of class but still with other students. I think that would help break down the idea that school happens from 8 to 3 everyday. It can be more like school is happening all the time or as much as you want to get out of it.

Jill then added, "Providing a lot of resources to them online that they can access when they are not in school is a good thing—giving them an outlet like Mike said. I really like the idea of the blogs that my teacher does because they respond so well to them." The literature also discusses how blogging can be a powerful tool for English students. Groenke (2008) and Yi (2008) discuss the power of online, student-led communities that reinforces the skills we are teaching our students. Students feel free and excited to go to a place outside of the classroom and communicate about writing and receive feedback from their peers. The out-of-school literacy practices of the adolescents show how rethinking authentic interaction can spark student interest in reading and writing. Jill's experience and the growing body of research regarding online literacy engagement remind us as educators that we need to understand the value of students' literacy experiences beyond the traditional classroom and encourage such opportunities. In fact, researchers explain that we should take such creations of students, like student-led online discussions and blogging, as obvious cues for how to re-engage students in the classroom (Grabill & Hicks, 2005; Yi, 2008).

During the focus group, and later in his reflective interview with me, Mike discussed his thoughts on Jill's classroom blogs, and through his reaction I was reminded how, as Patton (2002) explains, the goal of a focus group is to record "high-quality data in a social context where people can consider their own views in the context of the views of others" (p. 386). I noticed how this study's focus group became somewhat of a supportive gathering for the three pre-service teachers where they exchanged teaching ideas and perspectives. Mike and Amy both showed interest in Jill's discussion of classroom blogging during the focus group, and they, consequently, during their reflective interviews, included blogging as a technology tool they would hope to include in a future classroom. This supportive exchange during the study also showed how the focal students benefitted from meeting and discussing their experiences during the semester.

Rochette (2007) found that incorporating student blogging in the English classroom revealed a "form of liberation" in the digital dimension (p. 47). The students' blogs became a place where expanded thinking beyond the classroom walls occurred, and Rochette found this freedom resulted in stronger student voice and thoughtful connections with texts and artwork. In addition, encouraging students to participate in a type of learning that they consider enjoyable, results in what researchers describe as a sense of play (Jenkins, 2006; West, 2008). This sense of play lowers the emotional stakes of failing, allowing students to take more risks (Jenkins, 2006). Blogging gives students a chance to feel free to experiment with texts, and it encourages an endless realm of creativity for students (Boling et al., 2008; Rochette, 2007; West, 2008).

Also during the focus group, Jill noted that she felt her cooperating teacher, Lisa, integrated technology fairly effectively, and Jill explained that she hoped to do the same. In the following focus group response, she described to the other pre-service teachers and me how her cooperating teacher's excitement for technology was infectious:

She is very excited to use it [technology]. She has a Facebook page for her class that is specifically geared toward parents, and all the parents have loved it, so now the other departments are trying to get something together . . .

However, Jill also mentioned several times to me that they would have problems with Internet access or logins at her practicum placement. What happens when a lesson does not go as planned because of an issue with the technology? Jill described how, during the times when the technology failed, her cooperating teacher's lack of adaptability resulted in a completely different lesson plan:

. . . Our technology has not been working very well, so she will have a book, and that is our back-up plan. She's very patient with it, which is good . . . She tells everyone to take a deep breath when none of them can login. She definitely likes it, but sometimes when she doesn't know how to solve a problem with it, she's like, "OK, we need to start from scratch. Throw that assignment out, and use something else." Instead of having a back-up [plan] in place that can use technology, or maybe some part of it, if that makes sense.

Jill's thoughts on her cooperating teacher's reactions to technology issues mirror Patrick's observations on what happens when the pre-service teachers encounter technology issues in the classroom. In his interview with me, he explained the following:

When the technology doesn't work, and there's some kind of troubleshooting issue . . . it's like all of the lights are sucked out of the classroom, while the teacher tries to figure out why this one component didn't work, and then management problems pop-up all over the place.

On observing as opposed to actually teaching, Jill described how she was “mostly doing observation” during the first few weeks of her placement. Instead of noting frustration at this lack of immediate lesson teaching, Jill explained in her initial interview with me how observing her cooperating teacher had helped her so far:

She wasn't doing so much with me directly during my first week there. I was mostly doing observation, and they do mostly have a computer cart in their class all the time. I could see what the common problems were. Like a lot of times the Wi-Fi would time out. I learned by watching what she did that tended to help people out when there were problems. I could try the solutions that she offered and see if one worked out. There has not been any official training, but maybe a little would be beneficial. I know she's on a Mac, and I'm on a PC at home, so that's a little different. But that usually is not a problem.

In her second technology blog entry for this research study, Jill described technology issues and how they were affecting the classroom:

Once again, technology has been used quite a bit this week, though my classes have been experiencing quite a few problems with their individual log-ins as well as the overall network connection—Internet has been slow and more nonresponsive than usual. As a result, we had to be fairly flexible with their assignment, a cause and effect paragraph to be submitted to their teacher's online

folder and then published to their blogs. Originally, the assignment was supposed to all be done on the computer, but we had them write a rough draft on paper first to avoid crashing the system with everyone logging in at once (it didn't help much) . . .

Jill's back-up plan to have students handwrite their paragraphs seemed like a good solution for the class. However, she continued to reflect in her blog post about how the unstable network connection of a "crashing system" affected the timeline of her lesson plans:

. . . This was supposed to be a one-day project, but lots of recording problems and slow computers have forced us to carry over into next week. Though a little frustrating for us, the students are excited about the assignment and are doing a great job of staying patient and on-task, so I hope this positive attitude also carries over into Monday!

Through this blog post, Jill shows how she had to extend the amount of time given to the assignment. Despite the frustrations of Jill and the cooperating teacher, it is interesting to see the note about a continued excitement among the students. At Jill's placement, the students often seem to be highly engaged with lessons that integrate technology.

At times throughout this study, I noted how Jill's responses would start to move into discussing perceived efficiency of online technology integration—both for the student and for the teacher. It became clear after talking with Jill that she believed teachers should use technology, even in simple ways, to enhance the classroom environment and simplify classroom tasks. When Jill was discussing the advantages of

online texts in her initial interview with me, she often described how online writing, annotating, and peer reviewing can be more efficient for students and teachers. She explained why she wanted to include them in her future classroom:

It's a lot faster, too. Most kids now are typing way faster than they can write, so maybe they find something that they think is a really important point in the text, but they don't want to take the time to fill up the margin with their writing. But they would be more willing to do it if they could type up a little something. Also, it would be easier to share with the teacher that way, and it's great to have them all online. It would save teacher time, student time, and general assignment grading turnaround time.

For her classroom artifact, Jill sent a copy of one of her first and favorite assignments—the “I Am...” poem (see Appendix 4 for Jill's artifact). Jill had students complete this activity early in the semester, and she explained that “students were able to write about themselves, and it was a great way to get to know my students right away.”

As for pre-service teacher preparation, Jill initially discussed what she thought would be helpful, including a technology resource pool for English teachers:

Jane: To prepare pre-service teachers to use technology, what should an ideal teacher education program include?

Jill: I think basic proficiency is what most of us have grown up with just by having computer classes already, so it's sort of unspoken. But a lot of times those are so far back that a quick refresher would be good, especially Excel and stuff like that. A resource pool that you give to teachers about technology you could use, that would be helpful because it's somewhat daunting when you go to the

Internet and there's so much stuff when you go to look at English resources. You get three million hits, and most of it is like books you have to buy, and you really have to hunt through it to see what would work. If our school had a solidified list of good resources that we could just put in our pocket, that would be so helpful. Because chances are if you have a lesson that you are working on, there is something online that could help you out. But wading through everything is next to impossible, especially when you have such a limited time to plan lessons. It's just easier to do it yourself. Some ideas would be helpful out there.

Also during her initial interview, Jill stressed the importance of "being able to communicate with your teacher by email, even in middle school." She explained that email is a powerful communication tool that teachers should use to help build relationships and make students feel more comfortable:

Growing up, email was this thing that adults had, but now kids have them. If you could start by having them email their teacher earlier on to start talking to them about any problems they have or questions they have but no one else had. That would take out the embarrassment factor, and I think students would appreciate that if they were falling behind and didn't want anyone else to know. It helps to form relationships, too.

Jill's technology blog posts for this study often documented how she incorporated technology at her practicum placement. One mid-semester blog post explained a Garage Band audio project, and she also included more details regarding the privacy of the classroom blog site:

Students finished a podcast assignment that they started at the end of the previous week. They were only given one in-class workday, and the project was due at the end of the week (largely due to tech issues so we wanted to give them a chance to work during seminar time). The project was a simple 10-30 second voice clip about bacteria awareness that integrated sound clips using Garage Band. After this assignment (or at least the workday) was over, students moved onto their next big project—prewriting for an editorial assignment about a pressing issue in their school. No computers have been used yet for this assignment, but we'll use them later this week. Also, I asked about the blog site the school uses and my teacher explained that it's just a private server that only students and teachers are given access to (safety reasons) that allows them to create blogs, wikis, and discussion boards. Pretty cool, and definitely something I'll look into using in my classroom!

When talking with Jill during her reflective interview at the end of the practicum, she highlighted several positives of her experience. She felt that she had a supportive cooperating teacher who was a “great mentor.” She again noted that students enjoyed blogging and stressed that technology use was “a very regular thing for her [cooperating teacher's] class, and such a regular thing for her.” She elaborated on how basic technology use was necessary and natural for the students as well:

The fact that they had access to them [computers] everyday made it so they used them more than they would have. So like for seventh grade, they would type up their rough drafts and final drafts, instead of writing a rough draft on paper and typing up a final. It was very natural for them. They liked using the computers

and being able to personalize them. The only time it was an issue was when the network was being really slow, and everyone's trying to log on at the same time. There would be some impatience, but for the most part, they are very used to it. And they want a one-to-one initiative with iPads now. It's just a very regular part of their school day.

Jill also explained how the basic technology that she used at her placement was not as advanced as the technology that she learned in the university program. This was a common finding among the focal students and consistent with the literature. Teacher education programs need to infuse technology with content area practice and teaching. Technology tool training is not enough, and the tools are not included in a meaningful manner (Borko et al., 2009; Mishra & Koehler, 2006).

During her reflective interview with me, Jill explained the technologies that she learned from the program's educational technology course and described how she learned more advanced technology at the university when compared with her practicum placement classroom:

A lot of what we learned in our technology class was way more advanced than what I would use with my middle schoolers. We learned how to do iBooks, iMovies, podcasts, websites. The only thing [used at the practicum placement] was podcasts for one assignment. That could have been just the age, seventh grade. And the class was designed for anyone in education to take, so they wanted to cover a lot, which makes sense.

Jill's reflective discussion of how the university's educational technology course included students from all content areas of education, and therefore aimed to cover

technology in a broader sense, is consistent with the literature (Borko et al., 2009; Mishra & Koehler, 2006). Rather than teaching technology within content area education courses, university programs often include technology as a separate course for all education students, and, as Darling-Hammond (2006) discusses, we need to work toward cohesion and integration, bringing subject matter learning together with content pedagogy and cross-curricular connections.

However, also during her reflective interview with me, Jill emphasized that she found the educational technology course to be helpful, and she specifically highlighted an overarching need for students to be flexible and independent:

Jane: Some people say that you cannot fully prepare someone to teach with technology due to the changing nature of technology. How would you respond to them?

Jill: Definitely it's hard, but that doesn't mean you shouldn't do it. I'm glad I had that class because I'm sure other programs would have similar things, and having basic literacy of navigating those is really important. It will take years for those to make it to schools. It's also important to be flexible. Maybe it means that as a teacher you have to look up some extra stuff and take that initiative and look it up on the Internet for yourself and see what's out there and what other teachers are doing and what you can bring to your school. It's important. It's a challenge, especially for English teachers, because we are so used to books, and we tend to be people who like reading books and physical copies of books and writing on paper physically, so it's hard to tell everyone to move away from that, but having the option is important.

In addition to her discussion of flexibility and adaptability, it was also interesting to see how, similar to her initial interview with me, Jill still emphasized the challenge for English teachers to integrate technology “because we are so used to books . . . physical copies of books.” The other focal students did not express the same gravitation toward physical copies of books as Jill did throughout the semester. This shows how we, as Rodriguez and Hallman (2013) discuss, should not oversimplify the traits of a generation, and we need to continually consider the individual learner biographies of millennial pre-service teachers. Jill also mentioned the importance of being flexible, similar to her adaptability response of her initial interview, and she again described how the local public school district is not as current with new technologies as the university.

Jill’s last technology blog post for this study documented the end of her practicum experience and showed her progress during her field placement:

During my final week, I had almost nearly fully control of the class as they worked on an editorial assignment (a twist on a regular persuasive essay, students were required to research at least one fact or statistic to back up their opinion about an important problem facing Pathways Middle School. Laptops had been acting up and taking more than ten minutes to log on, so I spent Monday and Tuesday in the computer lab with students as they typed their final copies, sending them back for a classroom study hall with my cooperating teacher when they finished. Using these computers was much less stressful. Students were also required to share their editorials on their blogs, which we shared as a class on Wednesday, following the format (described in an earlier post) of students reading portions of their blogs, as well as pictures (if they included any) and then fielding

questions from their classmates in a discussion while students posted thoughtful comments about the writer's strengths. All in all, it was a great way to end the experience on a high note seeing how much students' writing had improved since I saw their first papers!

This last post also showed how Jill continued to effectively incorporate blogging with writing, peer review, and class discussion in a meaningful way. Throughout the interviews, focus group, and blog posts, it became clear that Jill had a cooperating teacher who she described as a "great mentor" and a "healthy skeptic about technology" in the classroom, and she felt that this helped her have a positive practicum experience.

During her reflective interview with me, I asked Jill to tell me what most affected her technology use in the practicum classroom. She responded that her cooperating teacher affected this the most:

I would say that the level that my teacher uses it because I wouldn't want to introduce anything new. I also wouldn't want to do anything that was just pencil and paper, unless that's how she does it. I really try to do what I do based on what she does, especially during this practicum experience. And that's the thing that might be a little different than student teaching when I have more control over the classroom . . . it's just like I'm an assistant here. I'm very hesitant to change things up. My use was highly dictated by what she did.

As she described in her response, at times, she felt like she was a teacher-assistant during the practicum, and she learned from observing her cooperating teacher and helping students during the practicum. Jill's cooperating teacher often incorporated laptops and blogging, which she thought helped student engagement and classroom

culture. Throughout Jill's practicum journey, she also mentioned a few moments where technology did not work (Internet connection and student log-ins) so a back-up lesson plan was needed. Her cooperating teacher tried to react smoothly when the technology issues occurred, although Jill felt sometimes the back-up plan was very different from the original one.

As for the university technology preparation, Jill felt like there was much more technology preparation than what her placement actually had available. She thought it was practical to learn how to use the SMART Board, but she did not have one at her practicum placement. Jill thought it would be helpful for the university to organize a resource pool, specifically a list of relevant English education resources.

Also during her reflective interview, Jill explained that her advice to future practicum students is to take the teaching opportunities when possible and try to get as much practice as possible. She also stressed the importance of incorporating technology in a meaningful and engaging way:

Just go into it with an attitude that you should be ready to go. If your teacher gives you the opportunity to do anything or teach anything, try to take it. Unless it's something you're really not comfortable with. If you're a little uncomfortable with it, go with it. And that's OK. I think I was really hesitant at first . . . and by the end I was like, I want to get as much practice as possible . . . Say yes to as much as you can, as much as you are capable of doing, do it. And on a more technology note, try to find ways to use it that are new and meaningful and not just replicating a paper and pencil assignment on a computer because that's still pretty boring. You're using a computer, but it's not making it much better.

In this final reflective interview response, Jill began her statement by discussing the importance of attitude, and she described how a pre-service teacher's attitude affects the practicum experience in the field. However, she also noted how the cooperating teacher influences the experience by granting (or not granting) a pre-service teacher "the opportunity to do anything or teach anything." When given the opportunity, Jill encouraged other pre-service teachers to "try to take it." As for integrating technology, Jill wanted to caution pre-service teachers to integrate it in a "meaningful" way.

Jill's advice to future practicum students summarizes her actual practicum experience and attitude fairly well. She did often report taking teaching opportunities as moments to jump in and learn with her students. Jill reported having a positive experience, and she also highly respected her technology-savvy cooperating teacher and followed her guidance fairly closely. And while Amy and Mike sometimes discussed their lack of technology support, Jill felt her cooperating teacher was supportive with technology, and she often discussed effective content area technology use with writing and blogging. In addition, knowing that she had her cooperating teacher's support was empowering for Jill, but Jill also felt a personal lack of technological pedagogical content area knowledge and wished she had had more university preparation with infusing technology with teaching English.

Amy's Journey

During her initial interview with me, when asked to describe her placement so far, focal student Amy, unlike the other focal students at the beginning of the semester,

described what she was doing as “teaching” and spontaneously included technology with the SMART Board integration in her response:

I am in the midst of teaching a unit, and it’s going great. I have been teaching three weeks so far. I have been able to use the SMART Board quite a bit, and we also have a projector that works with the SMART Board, so we can project things on the screen. I use the SMART Board on a regular basis. We also use computer labs on some projects, and that’s the extent of it.

I noted that even in her initial interview early in the semester, when discussing her practicum classroom, Amy responded with first person, inclusive language, using the words “I” and “we” as opposed to the other focal students’ use of “she” and “they” at that point in the semester. She stated, “I am in the midst of *teaching* a unit,” and, rather than stating that *they* use the SMART Board at her practicum, Amy responded with “I use the SMART Board.” This early discussion showed how Amy’s initial attitude toward her field experience was different from the other focal students’ attitudes. Yet it also became clear during the initial interview that Amy’s cooperating teacher’s attitude and ability to incorporate technology were different from the other focal students’ cooperating teachers’ attitudes and technological abilities as well.

During her initial interview with me, focal student Amy talked about how her cooperating teacher, Martha, and described Martha as “older . . . over 70 years old.” Amy discussed how Martha lacked much of a technology background beyond the online grading system, which Amy said Martha did “show me how to use the grading system online, and how I can access it at home.” While Amy noted that she would be more likely to go to a university professor for help with technology, it was clear that Martha’s

lack of technology skills did not prevent Amy from integrating technology in her classroom at North Middle School. From the beginning of the practicum experience, Martha encouraged Amy to lead the classroom during her practicum. However, while Amy often experimented with technology tools in her practicum classroom, she did not always know how to integrate it effectively and wished she had had more guidance from her cooperating teacher.

During my initial interview with Amy, she explained the following about preparing people to be adaptable for technology:

I think you can prepare people to be adaptable for technology so they feel comfortable learning new technology as it comes. Being flexible is important, too . . . For the most part, I think I'm pretty prepared as I can be, and I think learning the tools that are available in the classroom right now will help me. And it's even more important to be adaptable.

And while Amy often highlighted the importance of adaptability and flexibility, during her initial interview with me, Amy was also the only focal pre-service teacher to mention how people may not always like change and adapting to new technologies:

It's hard to be up to date all the time. It's hard for teachers and students. And people in general don't always like change. And it's expensive, and I understand why they aren't always on the ball.

This response showed how Amy viewed technology training as “expensive,” and she also viewed teachers and students who are not up to date with new technologies as reluctant to change. This discussion of how “people in general don't always like to change” in regards to technology integration is consistent with the literature. Critics of

implementing modern technologies in the classroom discuss a fear of losing the emphasis on the traditional curricula of schools, while for other teachers, the fear is of the unknown, as they admit to feeling clueless with these technologies, at times alluding to feeling less competent with them than their students (Archambault et al., 2010; Petko, 2012). And while Amy wished her cooperating teacher had more technology skills, Amy also noted that Martha was supportive in allowing her the freedom to teach as she wished during the practicum experience.

And while Martha did not have up to date technology skills, Amy did have some university technology preparation with the SMART Board, and she was able to implement it effectively, mostly using it for presenting and reviewing material and modeling guided notes at her practicum placement. As the literature shows, teacher-enhanced and technology-enhanced scaffolding are two techniques that have the potential to help students with text comprehension and literacy learning, and they can also help show students how to self-regulate through metacognitive modeling (Kymes, 2005; Lopez, 2010; Raes et al., 2012). Raes et al. (2012) found that when incorporating technology and helping students comprehend online texts, teacher-enhanced scaffolding has a significant impact on student comprehension and information problem solving.

During the initial interview, Amy discussed how the university program had helped prepare her for teaching with technology in the field, and she specifically described her SMART Board preparation:

Jane: Describe an effective technology lesson that you have encountered in the teacher education program.

Amy: They had us use SMART Boards last semester [in the educational technology course], and basically, we went through all the basic tools of the SMART Board in class together. And then we were given an assignment in small groups to develop and deliver a fifteen-minute lesson using the SMART Board that was also interactive. That was really helpful because a lot of interaction makes students more engaged. We learned how to use the visual tricks where you can hide and reveal answers. It's kind of cool. I have not had a chance to use that yet, but I would like to use it in the next week or so.

Jane: Was the lesson in your content area?

Amy: Yes, we did apply it to our content area. I believe we made a grammar lesson.

This response showed how, during the university program's educational technology course, Amy had learned how to use a relevant classroom technology tool, the SMART Board, and she had also practiced applying this tool to teaching within her content area while in the educational technology course. Amy's educational technology course lesson and activity example showed integration of technology, pedagogy, and content knowledge, just as the TPACK framework suggests for preparing students for meaningful technology integration (Mishra & Koehler, 2006).

During her initial interview with me, in addition to noting that she had learned how to use SMART Boards, Amy also highlighted that wanted to use them interactively throughout the practicum placement in order to increase student engagement. The literature also states that meaningful SMART Board, or interactive whiteboard, implementation has the potential to create strong connections with students by using

multimedia that appeal to students' multiple senses. Rochette (2007) discusses how implementing the SMART Board in the classroom can appeal to students' visual and digital intelligences and found that she could better teach critical thinking and combine the visual with the written text for increased student engagement.

Amy had already had the chance to incorporate the classroom's SMART Board at her placement early in the semester, and during her initial interview, Amy explained, other than computer labs, that the SMART Board was the main technology tool that she had available in the classroom:

I have been able to use the SMART Board quite a bit, and we also have a projector that works with the SMART Board, so we can project things on the screen. I use the SMART Board on a regular basis. We also use computer labs on some projects, and that's the extent of it.

And again, Amy discussed SMART Board use during my focus group with the focal students, which occurred in the middle of the semester-long practicum placement. Amy, the only focal student with a SMART Board in the classroom, described to the group how she had been incorporating the interactive tool:

I definitely use the SMART Board and the projector with the SMART Board quite a bit. For example, yesterday we did a study guide-building exercise, and they followed along with me while I switched back from projecting what I was writing on my study guide [and then back] to a map of South America.

During this discussion, Amy explained to the other focal students how she modeled guided notes for her students while using the SMART Board, and Jill and Mike noted that their practicum classrooms were not yet equipped with SMART Boards.

Throughout the practicum experience, Amy reported using the SMART Board and projector nearly daily, and she also shared online Prezi presentations with me as her artifacts from the field. Amy noted that she also learned how to use Prezi while in the university program's technology course. One of Amy's Prezi artifacts showed how she used the online presentation program to introduce students to the main concepts and images of the Incan Empire (see Appendix 5 for Amy's artifact). With one Prezi presentation, Amy began the presentation with an overview screen, which "zoomed out" from the four slides of information on the rise of the Incas. Then, she "zoomed in" to discuss one slide or main idea at a time regarding the rise of the Incas. These main ideas included the following: place and location, lifestyle, military, and religion. Amy noted that she used the SMART Board and projector to show students the Prezi presentations.

During the focus group, Amy also explained with more depth how her cooperating teacher was "supportive" of Amy's lessons, yet, as a cooperating teacher, she did not truly help guide Amy with lesson planning or technology integration. And while Mike and Jill often described feeling limited or guided or affected in some way by their cooperating teachers' established systems of teaching, Amy highlighted the "freedom" to teach how she wished. Furthermore, while Mike and Amy both reported during the focus group and interviews that they believed their cooperating teachers lacked technological knowledge, these two focal students had very different attitudes and outcomes during the practicum experience.

Mike viewed his cooperating teacher's lack of technological knowledge as frustrating and limiting regarding what he could use at his placement, but Amy viewed her cooperating teacher's lack of technological knowledge as more of a missing

instructional component that she had the opportunity to “fill in.” During the focus group, I began to note the differences in the focal students’ individual attitudes and their perceptions of the role of the cooperating teacher as well. In the following response from Amy, she showed her attitude toward her cooperating teacher and practicum placement. Amy was able to differentiate support from knowledge, and she also explained how she integrated technology with seemingly no technology guidance from her cooperating teacher:

My cooperating teacher is very supportive of pretty much anything I want to put out there as far as technology or lessons. I don’t think she is as knowledgeable about technology. When I was observing her at the beginning, it was more textbook-based. The few times I’ve used the textbook, I projected it so kids could see a bigger image of it. She is supportive, but she would not be able to be like, ‘Hey, you should do this with the SMART Board,’ because she would not know how to do it. I don’t think she is as knowledgeable as maybe some other teachers are.

When asked how the middle school students have responded to the technology that had been incorporated, Amy responded positively and discussed how students are more engaged with technology use:

I think it keeps their focus longer. I think when they have a big image projected, they are able to follow along with me. It keeps them guided along with where they are supposed to be. I think for the most part they react very positively to technology. I know that when we use laptops, they are more excited about the assignment. When we go to the computer lab, it is like a change in scenery, like a

change from using pen and paper. So, I think they are generally positive when it comes to technology.

Amy thought that this increased student engagement with technology seemed to continue for her students, and when I talked with Amy at the end of her practicum experience, she again mentioned the SMART Board as her main form of technology use:

Jane: What types of technology did you use in your practicum placement?

Amy: Definitely the projector on the SMART Board. I would take student work and project those assignments. When we would build our study guides together, I'd have mine up there. We'd also take notes together as a class. So modeling was really the key use of that SMART Board, and that really helped. Used it almost everyday to project assignments [and also used it to] work as a class together. YouTube I used a lot. I used Prezi. Basic stuff like PowerPoints. Then we also brought in laptops, or we could go to the computer lab. You have to reserve the cart, and you have to reserve a spot in the lab as well.

Remaining consistent throughout the semester, Amy's technology use continued to be SMART Board implementation, and although she added YouTube and PowerPoints to her reflective response, she still used the SMART Board for these technology tools as well.

In her technology blog posts for this study, Amy wrote about how she incorporated technology each week, and in the middle of the semester, Amy described her plans for wrapping up a unit and helping students with writing:

Next week (Monday) Martha, my cooperating teacher, wants me to sort of wrap up the unit briefly. I want to do this by going over the exam with the students and

going over excerpts of their writing, all of which I will do on the SMART Board again. I will update the blog on how this goes!

In her blog post, Amy revealed that Martha had some involvement in planning for the unit wrap-up, but Martha left the lesson up to Amy's choice. Amy chose to use the SMART Board again, and she described that she would use it for writing instruction—"going over excerpts of [student] writing" with the class.

Also during her practicum, Amy was exploring possible teaching jobs for the following school year. In a technology blog post for this study, which Amy titled "Interview questions about technology," she wrote about how technology preparation was included in an interview with a local school district administrator:

In a screening interview last week, I was asked the question: "How have you implemented technology/how do you plan to implement technology in the classroom?" I was able to provide an answer relating to this [study's] blogging experience and other experiences we have discussed. I was also able to elaborate on ideas I have gained from this experience and other classroom observations. Technological knowledge is something that administrators seem to view as important when looking for new teachers.

This blog post from Amy revealed a few important pieces. First, as a Millennial and as a prospective teacher, Amy is interested in presenting herself in a way that will help her attain a teaching position and establish herself as a teacher-worker in New Times. She reflected in her blog that she found the overlap between her involvement in my study and her screening interview question to be interesting and timely. In addition, she cited her blogging for this study's technology blog as one experience that has

contributed to her preparation for classroom technology implementation. Further, she used the phrase “technological knowledge” when describing what “administrators seem to view as important when looking for new teachers.” This post reminded me of the literature that states how Millennials shape-shift and adapt their portfolios to become more marketable as workers in New Times (Gee, 2000; Luke & Elkins, 1998).

In her reflective interview, Amy described the freedom to teach as flexibility, but she also noted how her cooperating teacher’s lack of technology knowledge affected her experience with technology:

She gave me a lot of autonomy which was really great, but at the same time, I’d say she was not very well-versed in technology, so I didn’t have a lot of hands-on instruction with that, so I often did things on my own. I also taught her things with that, too. But I would say her flexibility with letting me do my thing on my own really gave me a lot of familiarity with teaching, so I could be more comfortable with the process. But also her lack of knowledge of technology limited my experience with technology.

This was a consistent response throughout Amy’s semester-long practicum experience, although in the above reflective interview response, Amy also highlighted how she “taught her [cooperating teacher] things with that [technology] too.” In addition to Amy realizing that her cooperating teacher lacked technology skills, rather than responding negatively, Amy responded by teaching her cooperating teacher new technologies, which showed a positive attitude toward her cooperating teacher and practicum experience.

When I asked Amy to reflect on the differences between the university's technology preparation of pre-service teachers with the reality of technology integration in a middle school classroom setting, she noted differences in technology availability at the field placements and also, once again, highlighted the importance of attitude and adaptability with technology preparation and integration:

Jane: In your experience as a pre-service teacher, what major differences do you see when comparing the use of technology for a university assignment vs. the use of technology in an English classroom setting?

Amy: I think I was definitely trained with more than what I've used so far. That's something I want to elaborate more as I go into my student teaching next semester. From what I've heard from my [student teaching] cooperating teacher, they [student teaching school placement] are much more versed in technology. Edmodo is something I really want to experiment with, but they did not actually teach us that in the tech class. Some things we learned in the tech class—maybe iMovie, getting kids to create their own projects, and using computers more often. I think I could explore with that, especially with more support from my cooperating teacher.

Jane: And some people say that you cannot fully prepare someone to teach with technology due to the changing nature of technology. How would you respond to them?

Amy: I would say that's definitely true. Just teaching people to be flexible and not to be afraid of computers and technology, and training them with the best they have available today is the only way to go forward, I think. If you can feel

comfortable doing whatever's perfect now, then you'll feel more comfortable moving into something different as it changes—teaching people not to be intimidated by the use of technology.

In addition to being flexible and comfortable with technology, when discussing technology effectiveness in the English classroom, Amy explained in her reflective interview how she thinks “Language Arts is so flexible because it has such abstract content; you can kind of manipulate any technology to benefit what you are doing.” Amy’s enthusiasm for meaningful SMART Board integration continued during her reflective interview as well:

I hope that my classroom next semester [during student teaching] has a SMART Board because I think that’s super effective, especially with peer editing and looking at another kid’s work. What’s great about the SMART Board is kids can walk up to the screen and edit sentences and change structure of the text in ways they think it is improving. So kids really feeling like they have ownership over their work. I think that’s really important.

Amy also noted during the reflective interview that, in her future English classroom, she would like to incorporate an online turning-in system, blogging, and Edmodo, an online social platform for schools:

I would like to have an online turning-in system so kids don’t actually physically hand in major assignments to me. They turn them in online. I also want to use blogs and Edmodo. I think [turning in online] is practical, and it’s what I do as a college student. It’s what they’ll do in college . . . it’s all on the computer.

When asked to elaborate on including blogging in her future classroom, Amy explained:

I think it's a really great way to get kids speaking and thinking in ways that they don't feel intimidated by their peers. Oftentimes, I think that the kids that get left behind, especially in the classroom where student discussion is highly valued, are those shy kids who don't feel comfortable speaking out or sharing their opinions because they're much more comfortable behind the keyboard and where they are able to express their understanding and mastery of the content without feeling overwhelmed.

Amy's thoughts on blogging were similar to the thoughts of other focal students, and they are consistent with the literature that states how blogging can be a "form of liberation" in the digital dimension (Rochette, 2007, p. 47). Amy and Jill, as discussed further in Jill's journey, envision blogging as an engaging activity where students may practice formal or informal writing in a safe place where, as Amy explained, students "don't feel intimidated by their peers" and feel free to share their voices.

In Amy's final technology blog post for this study, she reflected on online social communication learning tools and a recent visit to her assigned student teaching placement at a local public high school:

Recently I visited Highland High School and was given the chance to be given an in-depth tour of Schoology, which is a program similar to Edmodo that HHS [Highland High School] uses all the time. This is yet another tool I would love to use in my own classroom someday. I also observed an English teacher use a silent Socratic seminar with today'smeet.com. It's essentially a chat room where

students can discuss content silently. The teacher wanted to use this program because she felt that a certain few students tended to dominate the conversation. Luckily today's meet worked great to include all students.

Amy's excitement for an online social communication platform is again evident in her discussion of Schoology. Amy's discussion of observing the online Socratic seminar with Today's Meet showed the impact of a pre-service teacher's observation of technology use, especially when integrated within the pre-service teacher's content area.

Researchers have reported a lack of field experience in an online or blended classroom (Kennedy & Archambault, 2012). Darling-Hammond (2006) highlights the need for extensive, intensely supervised clinical work that closely aligns with course work and states that "teachers-in-training who participate in field work with the course work are better able to understand theory, to apply concepts they are learning in their course work, and to support student learning," (p. 307). With a growing number of twenty-first century classrooms moving toward blended and online learning environments, Kennedy and Archambault (2012) discuss the need for pre-service teachers to engage in online webconferencing platforms as part of blended and online classroom field experiences.

Overall, Amy reported having a positive experience during her practicum. And although she noted how a cooperating teacher with technological knowledge would have been helpful in guiding her with technology infusion, Amy often explained how she appreciated having a cooperating teacher who gave her the autonomy to teach how she wanted to teach. During her reflective interview, Amy's advice to future practicum students included the following:

Don't be afraid to reach out and really get involved in the practicum, even though it's sort of an introduction to student teaching. You can really make the most of it. I had my principal come and observe me, so he knows my name. He knows what kind of teaching I'm capable of doing. Going around observing other teachers, meeting people, getting your name out there, can really make it a rich experience if people remember who you are. And as you go in looking for a career, you can use those people as references.

In her reflective advice, she first instructed future practicum students to "reach out and get really involved," which also showed Amy's attitude toward her own practicum experience. This attitude advice was similar to the advice of the other focal students', but Amy's advice then moved into centering around establishing one's self as a teacher-worker so "people remember who you are." Her statement reiterate how millennial pre-service teachers feel they must be cognizant of how they present themselves in the field, and use the field experience as a marketing opportunity as well as a teaching experience, keeping in mind their ultimate goal of attaining a teaching position.

Throughout the interviews, focus group, and blog posts, it became clear that Amy found the practicum experience to be a good one to have before student teaching. She had a cooperating teacher who gave her the autonomy to teach how she wanted to teach. And although Amy's cooperating teacher did not have more advanced technology skills, Amy thought she was supportive in the technology that she wanted to include. Amy used the SMART Board often, mostly for modeling assignments, presenting information, and filling in study guides, and she felt that

was effective and engaging for the students. Amy also incorporated YouTube videos and Prezis, which she sent to me as artifacts.

As for the university preparing her to teach with technology, Amy felt that she was fairly prepared and had been trained in more than what she was able to actually use in the field. She had had some SMART Board practice during the educational technology course, which she found very helpful. However, Amy also noted that it is even more important to be adaptable for technology. Amy would also like to include blogs in her future classroom because she think it is an effective method to get more students comfortable in expressing their thoughts. She also thought the practicum experience was important for establishing herself as a teacher-worker and observing other teachers, so her advice to future practicum students naturally highlighted the importance of being “involved” in the practicum.

Mike’s Journey

In his initial interview with me, Mike, a self-described “technology-literate guy” who “works in IT [Information Technology],” described the technology available in his practicum classroom at Lane Middle School:

My cooperating teacher has kind of gotten started on the technology, and we use the Airliner—which is basically a table with a stylus, and you can make notes as you go and underline stuff. We use the Airliner, document camera, and PowerPoint projectors. The room does not have a SMART Board. The Airliner is like a SMART Board, but you can’t click on things on the screen. It is hooked

up to Bluetooth. Internet is good throughout the building. The students have older laptops that take a little longer to connect, but they work OK.

Mike's classroom, although not equipped with a SMART Board, has a similar technology tool—the Airliner. Also during his initial interview with me, I asked Mike about how prepared he was to use the Airliner and other technologies in the classroom. When discussing what the university had prepared Mike to use, he responded with the following:

I feel a little in over my head as far as technology from [the university]. We learned how to use projectors for PowerPoints, and that's about it . . . I don't even know how to turn on the Airliner. She [cooperating teacher] has to walk me through it with baby steps. Like how to zoom in on the document camera—I wish I had preparation for that, and I'm a pretty technology-literate guy. And I work in IT. As far as an ed tech [educational technology] perspective is concerned, we learned stuff that they do not use in public schools. What we learned is wonderful stuff, but we haven't been able to use any of it.

Mike's discussion of the lack of relevance of the university program's technology preparation was similar to the responses of the other focal students and consistent with the literature that discusses university teacher education programs have inconsistent and cursory technology inclusion (Alger & Kopcha, 2009; Borko et al., 2009; Mishra & Koehler, 2008). I was surprised that this self-described “technology-literate guy” who works in information technology had experienced the technology struggles that he described.

However, Mike also discussed generational differences in his initial interview with me and highlighted the importance of adapting. He explained that for his digital generation of pre-service teachers integrating technology is “not that hard,” and “it is totally easy to adapt.” Mike also described it as a responsibility and willingness of the classroom teacher to stay up to date on classroom technology practices:

There’s information everywhere about the different technologies, as long as you take the time to look into it. It falls into the job of the teacher to keep updated on the practices, even if it is not specifically required in the job description. There’s information everywhere, so if you want to use technology, you can use technology. It’s not that hard to find. Sure for older generations, that would be harder. For our generation, we have been working with Internet and working with digital technology since we were small children. It’s not that hard for us. It is totally easy to adapt.

Also in my initial interview with Mike, when discussing how technology can be used effectively in the English classroom, he emphasized his thoughts that technology can be used in an effort to help promote a social justice or cultural platform in the classroom:

Jane: When do you think technology can be used effectively in the English classroom?

Mike: As a social justice or cultural platform. We have all this technology to use and these thousand dollar pencils. It would be really cool to have a forum or a live chat with students from different countries or other parts of our country. Hands-on communication over the Internet while talking about culture. Say we

are studying Hispanic literature or African-American literature—being able to contact people directly involved or affected and have Internet communication to enhance our project.

Mike described his technology hopes as an “idealistic view” of technology integration for connecting people across cultures and boundaries. Mike’s technology ideas often focused on implementing multimedia and online social communication. His responses throughout the practicum also highlighted the exciting potential of technology—especially synchronous communication and conversation. He again mentioned similar thoughts at the end of his initial interview when discussing his ideal future classroom:

Jane: What types of technology would you like to include in your future classroom?

Mike: Online communication, Skype, or a forum. Something that we can use to have conversations with other people of other cultures. Definitely multimedia and creative platforms. I don’t think English education should just be writing papers. I think a student may make a stunning presentation or a video or some interactive digital thing, [and] that’s as good as writing anymore—it’s online communication and creative and effective multimedia.

During the mid-semester focus group, Mike’s idealistic perspective and hopes for technology were clearly not aligning with the reality of his cooperating teacher and his practicum experience. His description of his cooperating teacher had changed since his initial interview with me, and rather than referring to his cooperating teacher as “helpful,” as he did in the initial interview, during the mid-semester focus group, he described her

as “doubtful” and “set in her ways” when it comes to technology. Mike’s blog posts for this study also revealed a similar trend. However, he still maintained his hopes for technology in his future classroom and again noted how he envisioned technology during the focus group:

I’d like to have more out of class writing where they can share and go further than where we go in class, like the blog thing Jill was talking about. It’d also like to emphasize multimedia literacy as opposed to traditional text-based literacy. So using different programs, integrating music and visual, video and everything as well as the regular English. And having students work on those projects outside of class but still with other students. I think that would help breakdown the idea that school happens from 8 to 3 everyday. It can be more like school is happening all the time or as much as you want to get out of it.

During his reflective interview with me at the end of the practicum experience, Mike shared his thoughts on preparing teachers for technology integration:

Jane: In your experience as a pre-service teacher, what major differences do you see when comparing the use of technology for a university assignment versus the use of technology in an English classroom setting?

Mike: Shoot me in the head! That’s the problem. I can say what the problem is, but I don’t know what the solution is. It would be nice if there was a database somewhere of top ten resources for each different thing you might want to do with technology that gets updated by someone. So, if I were teaching educational technology, I could be a professor that makes that database, but after those students graduate, they will be teachers who never look at it ever again. I think

the best way to do it would be to have continual communication in the course and outside of the course. Like, “Hey, I found this.” The best way would be to keep in contact with students and the students keep in contact with the university who is at the forefront of [technology] changes.

In this response, Mike, once again, incorporated his vision of using technology as an interactive tool for communication, only at the university-level. He also touched on how university-student connectedness could help with preparing teachers despite the dynamic nature of ever-changing digital technologies

Also during his reflective interview, Mike discussed how literacy and language have changed and teachers need to change how we teach literacy:

Jane: When do you think technology can be used effectively in the English classroom?

Mike: A system like the blackboard classroom—things that are more synchronous than asynchronous. I really like the idea of blog posts and multimedia presentations. Multimedia presentations being things that have to incorporate video, audio, pictures, and texts. I really like those as an English assignment because literacy and language are no longer just text-specific. If you want to be literate, you have to be technologically literate, too. So I’d say synchronous telecommunications and multimedia literacy would be the best technologies to use in classes.

In this response, Mike highlighted how literacy and language are no longer text-specific and explained the more effective uses of technology in the English classroom would be synchronous communication and multimedia. As Mike reflected on the twenty-first

century classroom and new literacies, it is a reminder of how researchers discuss that teachers should work toward what Unsworth (2008) defines as a “literacy of fusion,” promoting a merging of literacy practices of student engagement in digital technologies with those associated with traditional school curricula (p. 71).

During the reflective interview, Mike also described the types of technology integration that he felt were ineffective in the English classroom:

PowerPoints are like an awful thing, and I don't want to ever use them in my classroom. Heady idealist, you know, I can say that. PowerPoints are bad. We spend a lot of time on word processing software—how to make your paper look best—but when you get to college, and every professor want your paper to look different. Discussion boards, like in Blackboard, are hard to have and are nothing more than a chore—it's hard to have a meaningful discussion. The answers are all pretty contrived. I think you run a really fine line with incorporating social media and have it be trying for relevancy but not really getting there. Least effective [technology in the classroom], I'd say, [are] social media, word processing, PowerPoints, and discussion boards.

Throughout the practicum experience, Mike stressed his frustrations with presentation software like PowerPoint, and his thoughts on the inauthentic nature of discussion boards are consistent with the literature. Mike's experiences with asynchronous discussion boards reiterates the discussion of Anderson (2006) who found that when students interact with each other in an online context, they show thoughtful discrimination when choosing which messages to reply to or ignore, and self-censor when attempting to articulate their thoughts in a way that will be accepted by their cohort or whole-class

group. This conflict with communication results in students who “lead two lives, one potentially involving the exchange of open, challenging, thought provoking messages; the other probably involving more cautious irregular interaction with relative strangers and a flattened, restricted, more cautious dialog,” (Anderson, 2006, p. 117).

Toward the end of his practicum experience, Mike sent a few classroom technology artifacts from his Native American Literature unit (see Appendix 6 for Mike’s classroom artifacts). The artifacts included a Twitter lesson plan, mock-Twitter assignment sheet template, and eight student PowerPoint presentations. The Twitter lesson included the following directions:

Twitter is an example of social media; tools we use to communicate ideas, feelings, or shared interests online.

Using 140 character or less:

1. Summarize your character’s emotion and its source from his/her perspective (ex: feeling like my parents finally abandoned me on this Alaskan island!)
2. Provide evidence from the book using the hashtag function (ex: #chapter one).

Be prepared to explain why your tweet is a good summarization of your character’s emotions!

In one of his blog posts for this study, Mike explained the unit and this Twitter assignment, and he included that he felt that the Twitter assignment had potential to be more engaging and authentic if he had more time and teacher support. Instead of having students fill in a mock-Twitter template, he would have preferred the real online version. He included the following reflection in his blog post:

Last Friday, the eighth graders and I began our Native American literature unit (covering Sherman Alexie's *The Absolutely True Diary of a Part-Time Indian* and Ben Mikaelson's *Touching Spirit Bear*). We will be using some technology in this, though much of the technology integration will take place outside of class independently. We began our Twitter assignment yesterday; students were to pick a character from their novels, choose a strong emotion that the character exhibited, and provide a citation of that emotion in action. They were then to compose a 140-character tweet from that character's point of view, citing the page they are drawing from in a tag. I would have liked for students that have Twitter (about half) to then publish their tweets in a live Twitter forum with me, under a new Twitter handle of course. However, time doesn't allow for this . . .

With this blog post, Mike again noted how he valued a more authentic experience with technology for his students, but he explained that he did not have enough time for the students to publish tweets in a live Twitter forum.

Mike's frustrated attitude toward his cooperating teacher's control and choice of technology, as discussed earlier in this chapter, continued throughout the practicum placement. In my reflective interview with Mike, he described his cooperating teacher as "very conversational," and explained that she "doesn't like to focus on the academic side of school, as in the strict academic side." Mike continued to describe Kim as a storyteller who he thought taught students fairly effectively through "stories, taking notes, and talking." While Mike perceived Kim as an effective teacher at the end of his placement, he still wished she had given him more freedom to integrate technology beyond PowerPoint presentations.

And despite Mike's irritations with his cooperating teacher's constant use of PowerPoint for technology integration, most of his students chose to complete PowerPoint presentations for the last unit's culminating activity. Mike's last technology blog post for this study discussed this and revealed his continuing frustration with his cooperating teacher:

My students finally turned in their projects in the last couple of weeks. Many of them were papers and poster displays, but I downloaded the electronic projects from my cooperating teacher's computer onto my flash drive. Most students made a PowerPoint with varying skill and effort, but a few made a video or a podcast. As far as teaching with technology, I have been phasing out of direct teaching. My cooperating teacher hasn't used much technology recently, remaining true to form besides using a document camera and showing videos to the class.

By referring to his cooperating teacher's lack of technology use being "true to form," he highlighted how his cooperating teacher has not changed the types of technology she integrated throughout the semester.

When asked during the reflective interview to describe his hopes and necessary technology for this to occur, Mike responded with the following:

Definitely a web cam and audio software, as well as a hi-resolution projector so that we can talk to people. I think it would be really cool to talk to the author of a book or an expert on a deceased author or someone from a different culture. Like when we're talking about issues with class and race, talking to an expert on issues on downtown Detroit or something, or you know, somehow give student a first-

hand experience at that. I hesitate to say a one-to-one ratio with tablets because I think it's hard to use that if they have it all the time. But definitely giving them tools like InDesign or Final Cut on computers where they can then make those multimedia projects I was talking about.

And, once again, in this response Mike highlighted his hope to someday use technology as an educational social communication tool—connecting students to others outside of the classroom walls.

Mike's advice to future practicum students focused mostly on the pre-service teacher's attitude:

Take some initiative early on in the practicum experience because I did, and that's what allowed me to use my own ideas. . . . My teacher definitely has a specific way she wants to run the classroom, and if you don't kind of wrestle with that early on, then she assumes that you're OK with everything that she wants to do. And you don't get to try out the things you might want to do while you have that sheltered environment. You don't need to be aggressive about it, but trying to take a lead early on so that your practicum teacher is comfortable with you trying your own things.

In this advice, Mike explained that he took "some initiative early on" and was able to use his own ideas, and he also discussed how future practicum students should "wrestle with" the cooperating teacher's established system early in the placement. It was interesting to hear him talk about the safety net of this "sheltered environment" where students are able to "try out the things" they want to include in the classroom. This reflective advice showed how the practicum experience challenged Mike to negotiate his role within an

established classroom system. Consequently, his frustrations with the cooperating teacher's current classroom system encouraged him to identify the important and seemingly non-negotiable pieces of his own individual teaching philosophy.

Throughout the interviews, focus group, and blog posts, it became clear that Mike felt that the practicum experience was helpful when he had the chance to teach and interact with the students, but he wished that he had had more opportunities to do so. Mike mentioned a few times that his cooperating teacher had very specific views on how to teach the lessons. He was frustrated with the many PowerPoint presentations that his cooperating teacher used, and he felt they were not the best use of technology and hesitated to classify them as technology. Mike also said that there were many opportunities to incorporate more advanced technology during his practicum, but he did not have the chance to really implement more technology due to his cooperating teacher.

Mike's practicum classroom had an AirLiner, PowerPoint projector, and the cooperating teacher also used YouTube videos. He had several ideas of how he would like to incorporate synchronous technology in his future classroom (e.g. have students meet people from different cultures; talk to people with knowledge of the content students are studying), and he also liked the idea of students responding to each other on blogs.

As for the university preparing him for technology use, Mike felt like the university was slightly ahead of where the local public schools are right now with the types of technology available, and he did note a lack of practical content area teaching with technology experience. However, he liked a simulated teaching activity from a university special education class and noted that it was where he decided he would like to

use synchronous technology. Mike also explained that there is information everywhere, and it is not too difficult for this generation of pre-service teachers to “look into it.” He felt that it is important for teachers to take this initiative, search for information and teach themselves when needed.

The Journeys of the Pre-service Teachers

As Mike and the other focal students discussed, depending upon their placements, the pre-service teachers encountered different levels of classroom technology access and use. In addition to varied classroom technology access, the attitudes of the pre-service teachers and cooperating teachers toward classroom control and technology integration and the cooperating teacher’s ability to integrate technology also greatly affected the experiences of the pre-service teachers. The participants discussed these factors with me during their interviews, technology blog posts, and focus group interview.

As I analyzed data collected throughout this qualitative study, it became clear that how the pre-service teachers apply their technology knowledge and skills to the field is dependent upon the individual attitudes of the pre-service teachers and cooperating teachers toward classroom control and technology integration, the cooperating teacher’s ability to integrate technology in the classroom, and the technology available in the field placement classroom.

In addition, throughout this study, it was evident that while a university teacher education program provided the focal students with a foundation for cursory technology integration, it did not consistently infuse technology with content area teaching, as suggested by the growing body of literature in support of cohesion and integrating

technology with pedagogy and content area teaching (Abbitt, 2011; Archambault et al., 2010; Darling-Hammond, 2006; Graham, 2011; Koehler & Mishra, 2009; Schmidt et al., 2009). The focal students in this study reported that they did learn how to use technology tools and programs (e.g. SMART Board) in the university teacher education program; however, they also noted that they would have felt more prepared if they had had opportunities for additional practice, particularly with integrating content area teaching with technology as part of their university program preparation. The focal students noted the importance of connecting technology tools to the content area in a meaningful way, and they stressed the need for additional support in achieving this goal. These findings are discussed further with recommendations in chapter five.

Chapter Five:

Technology and Pre-service Teacher Preparation

By following the focal students throughout their practicum experiences, I was able to examine their individual journeys in becoming teachers and see how they responded to the classroom challenges as they navigated the field. The interviews, blog posts, focus group, and artifacts from the field provided me with rich insight to the many facets of the practicum experience and the journey of a new teacher's development. This process has allowed me to respond to my research questions, which were the following:

1. How well does a teacher education program prepare pre-service teachers' construction of technological pedagogical content knowledge (TPACK)?
2. How do pre-service teachers apply their technology knowledge and skills to their experiences in the field?

The Pre-service Teacher's Journey

To respond to my research questions, it is necessary to look back and further discuss the experiences of the focal students, university supervisor of field experiences, and faculty member in chapter four. This qualitative study incorporated the focal students' stories as "portraits" (Lightfoot, 1983), and Stake (2006) discusses the value of analyzing the multiple cases individually as well as collectively, as "the single case is of interest because it belongs to a particular collection of cases...They may be members of a group or examples of a phenomenon" (pp. 5-6). Individually, the focal student's journeys provide insight into how they apply their technology knowledge and skills during the semester-long practicum experience in the field. And collectively, their experiences also

tell a story that is worthy of exploration and discussion, as their commonalities and differences provide a richer, broader scope for a deeper analysis.

The practicum experience exposes pre-service teachers to the common challenges facing new teachers in the field, and it provides them with practice responding to those challenges. The journey from pre-service teacher to practicing teacher can often be a transformative one, and teaching is full of unpredictable challenges. When discussing this journey in my interview with the university supervisor of field experiences, Patrick, he discussed his observations and noted how difficult it is to prepare pre-service teachers for complex classroom teaching as they enter the field. For pre-service teachers who have been taught best practices and perhaps bring with them a simplistic view of classroom teaching, the practicum experience in the field can be a pivotal one where they recognize and respond to the “complexity of teaching,” as Patrick described in chapter four.

Further, the varied classroom access and dynamic nature of new digital technologies also add to the complexity of pre-service teacher preparation and affect how they apply their technological knowledge to the field. Pre-service teachers need support in this journey. As I analyzed data collected throughout this qualitative study, it became clear that how the pre-service teachers applied their technology knowledge and skills to the field was dependent upon the individual attitudes of the pre-service teachers and cooperating teachers toward classroom control and technology integration, the cooperating teacher’s ability to integrate technology in the classroom, and the technology available in the field placement classroom.

To explore these findings further, it is critical to discuss the journeys of the study's focal students. Focal students Mike, Jill, and Amy each individually encountered unique challenges in the field, and, as discussed in chapter four, Mike often expressed how he felt "frustrated" by the attitudes and teaching practice of his cooperating teacher, Kim. Throughout his interviews and blog posts, Mike made it clear that he thought his cooperating teacher's PowerPoint presentations were ineffective. Rather than integrating PowerPoint in a thoughtful, meaningful way, Mike's cooperating teacher relied on the presentation program to present basic information and concepts each day. This, along with a lack of teaching autonomy, irritated Mike, who scored the highest of the three focal students in perceived technological knowledge on the TPACK survey and described himself as "advanced" in technology. Mike viewed his cooperating teacher's use of technology as repetitive and as a weak attempt to incorporate technology on a superficial level.

In his reflective interview, Mike stated that his cooperating teacher "kept trying to run the show." Through talking with Mike and reading his blog posts, it became clear that he was so frustrated with his cooperating teacher that he seemed to respond negatively to the practicum experience as a whole, feeling helpless in integrating the types of activities and technology that he had hoped to include.

Patrick explained that the pre-service teacher's practicum experience and the response to such frustration depends on if the pre-service teacher has been given what he describes as "the freedom to experiment." Patrick's discussion of control, more specifically the loss of control, and how it plays a critical role in the pre-service teacher's practicum experience was consistent with Mike's experience. Patrick also discussed the

differences between cooperating teachers and noted the power of a cooperating teacher who is open to new ideas. As Patrick described how this “openness” of the cooperating teacher’s attitude affects the experiences of the pre-service teachers, he also explained that it includes a willingness of the cooperating teacher to allow pre-service teacher experimentation to occur in the classroom.

The university supervisor’s discussion reminded me of Petko (2012) who explains that there is a multidimensional relationship between a teacher’s “will, skill, and tool” when incorporating technology. Petko’s findings explain why there are teachers who have unused interactive whiteboards and untapped technology tools in their classrooms. Beyond actually having the basic skills and training, for successful technology implementation to occur in the classroom, teachers must individually believe in the positive possibilities of technology for student learning, and they must also personally perceive themselves as competent with the new digital technology (Petko, 2012).

As Rowley et al. (2005) discuss, university students with instructors who are supportive of integrating a new technology report having a more positive experience with the technology when compared with students of unsupportive instructors. This highlights the need to further research teacher and faculty attitudes and support and the “will” piece of the Petko (2012) model. In Mike’s experience, not only did his cooperating teacher not want to relinquish control, but she also lacked the motivation to incorporate any different technologies, beyond PowerPoint presentations, in a meaningful manner. When Mike suggested trying a new technology, his cooperating teacher was not supportive. This left Mike feeling discouraged that he was unable to lead the class or experiment with other types of technology. Mike also began to attribute this negative experience to his

cooperating teacher's desire to maintain control, as well as a lack of technological knowledge.

Patrick continued to describe the result of the loss of control and how this loss of control or power results in the loss of a potential learning opportunity. In addition, he explained how it continues to affect how the pre-service teacher perceives the cooperating teacher and his/her teaching practices. This seemed very true for Mike during his practicum experience; however, focal students Amy and Jill were given more classroom control, resulting in more teaching and learning opportunities during the practicum.

In contrast to Mike's experience with his cooperating teacher, Amy often discussed the high level of freedom she had to experiment in her cooperating teacher's classroom, and Jill reported some freedom to experiment in her cooperating teacher's classroom. When talking with Jill during her reflective interview at the end of the practicum, she highlighted several positives of her experience. She felt that she had a supportive cooperating teacher who was a positive classroom guide.

Jill's last technology blog post for this study documented the end of her practicum experience and showed her progress during her field placement and stressed the writing improvement of her students as evident through their shared blogging exercise. This last post also showed how Jill continued to effectively incorporate blogging with writing, peer review, and class discussion in a meaningful way. At times, Jill did feel like she was a teacher-assistant during the practicum, but she stressed how much she learned from observing her cooperating teacher and helping students during the practicum. Jill's cooperating teacher often incorporated laptops and interactive blogging activities, which

she thought helped student engagement and classroom culture. Overall, throughout the interviews, focus group, and blog posts, it became clear that Jill had a cooperating teacher who she described as a “great mentor” and a “healthy skeptic about technology” in the classroom, and she felt that this helped her have a positive practicum experience.

Somewhat similar to Jill, Amy also found the semester-long practicum experience to be a positive one. However, during the focus group, Amy explained with more depth how her cooperating teacher was “supportive” of Amy’s lessons, yet, as a cooperating teacher, she did not help guide Amy with lesson planning or technology integration. And while Mike and Jill often described feeling limited or guided in some way by their cooperating teachers’ established systems of teaching, Amy experienced a different situation with her cooperating teacher and highlighted the “freedom” to teach how she wished. Furthermore, while Mike and Amy both discussed how their cooperating teachers lacked technological knowledge, these two focal students had very different attitudes and outcomes during the practicum experience.

Mike viewed his unsupportive cooperating teacher’s lack of technological knowledge as frustrating and limiting regarding what he could use at his placement; Amy viewed her supportive cooperating teacher’s lack of technological knowledge as more of a missing instructional component that she had the opportunity to “fill in.”

Amy explained how she integrated technology with no technology guidance from her cooperating teacher. It is important to note that when given the freedom to implement any or none of the available technologies, Amy chose to incorporate the SMART Board in every lesson and found it to be a practical platform for sharing relevant YouTube videos, Prezis, PowerPoints, and other technology tools as well. In her

technology blog posts for this study, Amy wrote about how she incorporated technology each week, and in the middle of the semester, Amy described her plans for wrapping up a unit and helping students with writing. In one of her last blog posts, Amy explained that her cooperating teacher, Martha, told her it was time to wrap-up the unit, but Martha left the actual lesson plan up to Amy's choice. Amy chose to use the SMART Board for writing instruction—"going over excerpts of [student] writing" with the class.

Also during the practicum semester, Amy was exploring possible teaching jobs for the following school year. In a technology blog post for this study, Amy wrote about how technology preparation was included in an interview with a local school district administrator. The administrator asked Amy during the screening interview, "How have you implemented technology/how do you plan to implement technology in the classroom?" In her blog post, Amy explained how she responded to the administrator by detailing her focus group participation and reflective technology blogging for this study. She ended her blog post with, "Technological knowledge is something that administrators seem to view as important when looking for new teachers."

This blog post from Amy revealed a few important pieces. First, as a Millennial and as a prospective teacher, Amy is interested in presenting herself in a way that will help her attain a teaching position and establish herself as a teacher-worker in the twenty-first century. She reflected in her blog that she found the overlap between her involvement in this study and her screening interview question to be interesting and timely. In addition, she cited her blogging for this study's technology blog as one experience that has contributed to her preparation for classroom technology

implementation. Further, she identified “technological knowledge” when describing what “administrators seem to view as important when looking for new teachers.”

During her reflective interview, Amy explained how she would advise future practicum students to “reach out and get really involved,” which also reflected Amy’s attitude toward her own practicum experience. This advice was similar to the advice of the other focal students; however, Amy’s advice then again moved into centering around establishing one’s self as a teacher-worker so “people remember who you are.” Her statements reiterate how some millennial pre-service teachers feel they must be cognizant of how they present themselves in the field, make a name for themselves, and use the field experience as a self-marketing opportunity as well as a teaching experience, keeping in mind their ultimate goal of attaining a teaching position.

Despite having a cooperating teacher who lacked technological knowledge, Amy chose to direct herself with technology use during the practicum experience. She found that her resourcefulness with technology enhanced her lessons and promoted student learning. Amy’s resourcefulness with technology may also be considered a trait of the shape-shifting Millennial. Amy’s determination and advice regarding attaining a teaching position echo the literature that describes how Millennials shape-shift and adapt their portfolios to become more marketable as workers in the twenty-first century (Gee, 2000; Luke & Elkins, 1998; Rodriguez & Hallman, 2013).

Rodriguez and Hallman (2013) discuss how Millennials continually adapt and shape-shift “in response to rapidly changing technologies, literacies, economies—the ability to learn, unlearn, and relearn, and their ‘portfolio’ is comprised of skills, experiences, and abilities” (p. 66). The dynamic nature of technological, social, and

economic changes has affected the Millennials' perspectives in changing times, and this practice of shape-shifting allows the pre-service teachers of the Millennial generation to adapt their portfolios and become more marketable as workers in "New Times," (Gee, 2000; Luke & Elkins, 1998; Rodriguez & Hallman, 2013). Amy's technology resourcefulness, as shown in her field teaching and discussed in her reflection, exemplifies this adapting and shifting portfolio-nature of Millennials. It is clear that the focal students, university supervisor, and faculty member viewed adaptability as a necessary feature of a pre-service teacher in the twenty-first century classroom.

University Program Preparation

To prepare pre-service teachers to teach in twenty-first century classrooms, teacher education programs place a heavy focus on technology tool training (Borko et al., 2009; Mishra & Koehler, 2008). However, as these pre-service teachers begin their teaching career, some are hesitant to replace traditional techniques with new forms of technology. Teachers who are critical of implementing digital technologies in their classroom discuss a fear of losing the emphasis on the traditional curricula, while for other teachers, there is a fear of the unknown, feeling clueless with these technologies, and, at times, alluding to feeling less competent with technologies than their students (Archambault et al., 2010; Petko, 2012).

While technology tool training is necessary, it is not that simple. Beyond simply learning how to use a new computer program or an interactive whiteboard, pre-service teachers need direction and focused experiences to thoughtfully infuse the technologies in ways that are relevant and help them build engaging and authentic learning experiences

for students. As Darling-Hammond (2006) analyzes twenty-first century teacher preparation, she highlights the need for cohesion and integration, bringing subject matter learning together with content pedagogy and incorporating cross-curricular connections. Recent research shows that while some teacher education programs are attempting to include technology tools on a somewhat cursory level, the tools are, at times, not included in a meaningful manner (Borko et al., 2009; Mishra & Koehler, 2006). Furthermore, little consistency can be found in how teacher education programs are integrating technology to prepare pre-service teachers (Archambault et al., 2010).

In addition, throughout this study, it was evident that while a university teacher education program provided the focal students with a foundation for cursory technology integration, it did not consistently infuse technology with content area teaching, as suggested by the growing body of literature in support of cohesion and integrating technology with pedagogy and content area teaching (Abbitt, 2011; Archambault et al., 2010; Darling-Hammond, 2006; Graham, 2011; Koehler & Mishra, 2009; Schmidt et al., 2009). The focal students in this study reported learning several technology tools in the university teacher education program, yet they also discussed a lack of depth and relevancy regarding the program's preparation of how to connect these technology tools to teaching lessons in their content area in a meaningful way.

Furthermore, the focal students discussed how the basic technologies that they had available for implementation at their placements were not as advanced as the technology included in the university program. This finding among the focal students was also consistent with the literature that discusses how teacher education programs

need to infuse relevant technology with content area practice, pedagogy, and field experiences (Archambault et al., 2010; Borko et al., 2009; Mishra & Koehler, 2006).

Jill's reflective discussion in chapter four of how the university's educational technology course included students from all content areas of education, and therefore aimed to cover technology in a broader sense, is consistent with the literature (Borko et al., 2009; Mishra & Koehler, 2006) and Dr. Williams' responses.

Dr. Williams, the faculty member who taught the educational technology course to the focal students and provided the syllabus for review, explained the difficulties of teaching the educational technology course content and discussed why he would typically teach technology tools as opposed to teaching content area teaching with technology. While Dr. Williams stated how it is "ideal" to teach technology within the context of content area teaching, he also noted how it is "difficult" and "impractical" to teach technology tools within content areas when he has students of various content areas enrolled in the same educational technology course. However, he also explained that he does encourage students to incorporate their content areas with technology assignments.

Furthermore, Dr. Williams discussed how it is not difficult to teach technology because of the dynamic nature of technology, "but because of the culture of the college/school of education and K-12 schools." He highlighted the challenge of having students who try to "get technology projects done rather than to learn technologies used in the projects." Dr. Williams also stressed that taking one course in educational technology is "not enough" and explained that students should use technology throughout the pre-service teacher education program. Dr. Williams also highlighted the transferability of knowledge, and researchers also similarly discuss that teachers must be

able to transfer and ultimately adapt their instructional practices to the changing dimensions within classrooms and remain open to exploring different possibilities of curricular design, including technology integration (Kajder, 2004; Rochette, 2007). This process should begin with the pre-service teacher during their teacher education program.

Furthermore, it is worthwhile to note that while this study's focal students discussed how that the teacher preparation program and the educational technology course should include more relevant technology, pedagogy, and content area teaching practice in preparing them for technology classroom infusion, they also identified adaptability as a crucial factor in transitioning from student to teacher in the field. In fact, all of this study's participants, including the university supervisor and faculty member, highlighted the importance of adaptability in their discussions with me. At times, the participants included a discussion of adaptability in the context of the ever-changing digital technologies, but, at other times, adaptability was discussed as a key characteristic of effective teachers within any classroom environment.

In the focal students' discussion of the university's educational technology course, the students emphasized that they found the course to be helpful. They highlighted an overarching need for students to be flexible and independent and also described how the local public school district is not as current with new technologies as the university. As for the university technology preparation, the focal students felt like there was much more technology preparation than what her placement actually had available. The students discussed how it was "practical" to learn how to use the SMART Board, although Amy was the only one with a SMART Board at her practicum

placement. They explained that they believed most local classrooms have or will soon have interactive whiteboards.

In addition, the focal students individually and collectively discussed how they thought relevant technologies should be meaningfully infused and modeled within content area education courses. They also noted that it would be helpful for the university to organize a content-specific technology resource pool, specifically a list of relevant English education technology resources. As for additional university support, the focal students found this study's online focus group and reflective technology blog to be supportive spaces where they could openly share their challenges and triumphs as well as practice relevant digital technologies during this critical transition into the field.

Blogging, as Rochette (2007) describes, can be a "form of liberation" in the digital dimension (Rochette, 2007, p. 47). Amy and Jill, as discussed further in Jill's journey in chapter four, envision blogging as an engaging activity where students may practice formal or informal writing in a safe place where, as Amy explained, students "don't feel intimidated by their peers" and feel free to share their voices. In this study's technology blog, Mike also wrote about his interest in Jill's practicum classroom's blogs and described them as more authentic online social communication avenues when compared with discussion boards. In reading the focal students technology blog posts, I found that this was true for the focal students as well. They felt comfortable sharing their reflections on the blog, and they also found comfort and inspiration in reading the varied weekly experiences of the other focal students.

The technology blog served as a safe space for open reflection and thoughtful dialogue, and it provided me with another layer of insight to the experiences of the focal

cases individually and collectively. Marshall and Rossman (2011) describe case study as “the most complex strategy,” as it “may entail multiple methods” (p. 94), and, for this qualitative study, the multiple methods provided me with rich insight to the stories of the focal cases. With the multiple focal cases, variables and complex situations, qualitative study that incorporated the investigation of multiple focal student cases proved to be the most relevant methodology for inquiry. As Merriam (2009) explains:

The case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon.

Anchored in real-life situations, the case study results in a rich and holistic account of a phenomenon. It offers insights and illuminates meanings that expand its readers’ experiences. These insights can be construed as tentative hypotheses that help structure future research; hence, case study plays an important role in advancing a field’s knowledge base (p. 51).

With this qualitative study, I aimed to better understand the participants’ experiences as they navigate their journeys from education students at the university to novice teachers in the field and apply these insights to help frame future research and practice regarding the technology preparation of pre-service teachers.

Future Possibilities for Technology Infusion in Teacher Education

Shulman (1987) described the process of watching students become teachers and observing their successes and errors as one that “highlights the complex bodies of knowledge and skill needed to function effectively as a teacher . . . the neophyte’s stumble becomes the scholar’s window,” (p. 4). Watching the focal students engage in

this process and listening in as they earnestly shared their hopes, concerns, and reflections, has affected me as a researcher and as a practicing teacher, and it should enlighten and direct us to reflect on how we can better prepare and support pre-service teachers on this critical journey.

Due to the dynamic nature of this “wicked problem,” there is not a simple, definitive solution, and the complexity of variables and contexts also make it difficult for teacher education programs to consistently respond to the needs of twenty-first century classroom teachers (Borko et al., 2009, Koehler & Mishra, 2008). However, as teacher education programs are searching for possible concepts and frameworks to incorporate, they should consider the experiences of the study’s focal students, university supervisor and faculty member in this study, as well as the growing body of research and the guiding standards from NCATE (2008) and ISTE (2008).

As evident in this study, consistent with the literature, tools for technology integration are simply not enough for pre-service teachers to feel fully prepared for teaching with technology, although they are a necessary component in pre-service teacher preparation (Borko et al., 2009; Mishra & Koehler, 2006). While it is evident that the university teacher education program and faculty are including technology tools, the pre-service teachers are not consistently learning and practicing how to integrate digital technology tools with their content areas in a meaningful way. In order to help prepare them for the twenty-first century classroom, this needs to change. Pre-service teachers need experience in considering and practicing the thoughtful merging of digital technologies with pedagogical content and instruction.

As Unsworth (2008) discusses, it is important to work toward a “literacy of fusion,” promoting a merging of literacy practices of student engagement in digital technologies with those associated with traditional school curricula (p. 71). Pre-service teachers should not be hesitant to include technologies and connections, yet researchers have found that many feel unprepared to include them. This raises concerns, as preparedness is a crucial factor in the retention of beginning teachers (Darling-Hammond, 2006). In order to help prepare pre-service teachers for thoughtful technology integration, relevant technologies should be meaningfully infused and modeled within content area education courses. The study’s focal students also noted that it would be helpful for the university to establish a content area technology resource pool, specifically a list of relevant English education technology resources.

In addition, as evident in this study’s focus group and technology blog, there is also a need for pre-service teachers to have supportive spaces as they transition into the field. As for additional university support, the pre-service teachers would benefit from having a collaborative space where they are encouraged to openly share their experiences in the field. In addition to offering pre-service teachers with opportunities for peer support and social connection, this collaborative space could also provide pre-service teachers with meaningful technology practice during this critical transition into the field.

Furthermore, as Howland and Wedman (2004) discuss, faculty technology training must also move beyond simply teaching a technology tool in isolation and also move toward a process-driven model. The process-oriented perspective includes “an awareness of what the technology can offer, opportunity to explore technology

integration, time to learn the technology, application of technology to teaching, and reflection on teaching” (p. 241).

Consistent with the literature, participants in the study also reported a lack of observation or field teaching experience in an online or blended classrooms (Kennedy & Archambault, 2012). Darling-Hammond (2006) highlights the need for extensive, intensely supervised clinical work that closely aligns with course work and states that “teachers-in-training who participate in field work with the course work are better able to understand theory, to apply concepts they are learning in their course work, and to support student learning” (p. 307). With a growing number of twenty-first century classrooms moving toward blended and online learning environments, Kennedy and Archambault (2012) discuss the need for pre-service teachers to engage in online webconferencing platforms as part of blended and online classroom field experiences.

As discussed in this study, one should not assume that Millennial pre-service teachers know how to automatically integrate technology with pedagogy and content knowledge in a meaningful manner. In order for pre-service teachers to be prepared to fuse this technology into classrooms, they need to be given opportunities to practice meaningful technology integration with content area teaching. We want to foster quality teaching and instruction with technology. Pre-service teachers must understand the importance of methodical planning for technology in content area teaching, see the need to implement it, and view themselves as competent in this fusion.

Implications for Future Study

Researchers discuss that experienced teachers must also adapt to the changing classroom technology dimensions and remain open to exploring the different possibilities of curricular design (Kajder, 2004; Rochette, 2007). This process should begin during the pre-service teacher's program, and teacher educators play a critical role in this development (Borko et al., 2009). However, teacher education programs' levels of technology fusion vary widely, and they need to be researched further in order to more accurately prepare pre-service teachers for twenty-first century teaching. There is a need for further research that explores why teachers report feeling unprepared and how teacher education programs can incorporate technology frameworks to help prepare and support them in and out of the classroom.

Additional research is also needed regarding the impact of student and teacher attitudes toward technology and effective teaching and learning. As discovered with this study's participants, the teacher's attitude toward new technology infusion affects the student's experience with the technology and the class content. The "will, skill, and tool" teacher dynamic is crucial to understand for successful implementation of technology in classrooms from the elementary to the university level (Petko, 2012).

Furthermore, due to the recent influx of online learning and new technologies in traditional, blended, and virtual classrooms, it is necessary to research the effective implementation of new literacies in classroom teaching practices and teacher education. When considering comprehension strategies with new literacies, there is a need for more research regarding multimodal scaffolding and online metacognitive awareness, as well as the online transfer of traditional print literacy strategies in teacher education. Additionally, as blended and online classrooms continue to grow, there is a need for more

research regarding the integration of blended or online classroom field experiences within teacher education programs.

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Appendix 1

Human Subjects Committee Approval

Planning for the twenty-first century classroom: Teacher preparation and technology

INTRODUCTION

The Department of Curriculum and Teaching at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study is to better understand how pre-service teachers perceive their technology preparedness and technology application during their practicum experiences in the field.

PROCEDURES

The study will use survey, interview, focus group, technology blog, and collection of classroom artifacts. The study will occur during the entire fall 2013 semester.

1. There will be one survey of educational technology background in fall 2013.
2. There will be two (30-45 minute) interviews in fall 2013.
3. During the period of the technology blog collection (this would be over the course of five weeks), pre-service teachers will write one reflective blog entry a week sharing a brief example (1-2 paragraphs) of how technology was used during that week of teaching. These are informal and are typed online.
4. There will be one (45-60 minute) focus group in fall 2013.
5. Classroom technology artifacts will be collected in the form of assignments, student work, lesson plans, etc.
6. The practicum supervisor and the educational technology instructor(s) will be interviewed in fall 2013.

All interviews will be audio-taped. Recording is required to participate. You may stop taping at any time. The recordings will be transcribed by me. Only I will have access to recordings, which will be stored digitally, password secured, and erased/destroyed in fall 2013.

RISKS

No risks are anticipated. Participants will be asked to give up some of their time to participate in interviews and blog writing once a week for 5 weeks.



BENEFITS

The potential benefits to the pre-service teacher-participants are that they will have the opportunity to reflect upon their teaching practice and technology preparation, and share the stories of their seminar and teacher education program experience with the researcher and perhaps the public. This act of reflecting and sharing allows pre-service teachers to become more critical and thoughtful regarding their pedagogical choices.

There are benefits to society, the teaching profession, and the fields of literacy and curriculum studies. These benefits include the understanding and portrayal of how pre-service teachers infuse technology with content area teaching.

PAYMENT TO PARTICIPANTS

Participants will receive no payment.

PARTICIPANT CONFIDENTIALITY

Your name, and your school and district's names will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researcher(s) will use pseudonyms instead of your name, school and district names. Your identifiable information will not be shared unless required by law or you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

INTERNET STATEMENT

It is possible, however, with internet communications, that through intent or accident someone other than the intended recipient may see your response.

INSTITUTIONAL DISCLAIMER STATEMENT

In the event of injury, the Kansas Tort Claims Act provides for compensation if it can be demonstrated that the injury was caused by the negligent or wrongful act or omission of a state employee acting within the scope of his/her employment.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to: Jane M. McManus, Department of Curriculum and Teaching, J.R. Pearson Hall, University of Kansas, Lawrence, KS 66045 or jmcmamus@ku.edu



If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429, write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

Type/Print Participant's Name	Date
Participant's Signature	

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Planning for the twenty-first century classroom: Teacher preparation and technology

INTRODUCTION

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The purpose of the study is to better understand how pre-service teachers perceive their technology preparedness and technology application during their practicum experiences in the field.

PROCEDURES

The study will occur during the fall 2013 semester.

1. There will be one (30-45 minute) interview with the practicum supervisor in fall 2013.

All interviews will be audio-taped. Recording is required to participate. You may stop taping at any time. The recordings will be transcribed by me. Only I will have access to recordings, which will be stored digitally, password secured, and erased/destroyed in fall 2013.

RISKS

No risks are anticipated. Participants will be asked to give up some of their time to participate in interviews.

BENEFITS

The potential benefits to the participants is that they will have the opportunity to reflect upon their supervisor experience during the practicum semester and share the stories of practicum experience with the researcher and perhaps the public. This act of reflecting and sharing allows participants to become more critical and thoughtful regarding their supervising role.

There are benefits to society, the teaching profession, and the fields of literacy and curriculum studies. These benefits include the understanding and portrayal of how pre-service teachers are prepared to infuse technology with teaching.

PAYMENT TO PARTICIPANTS

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PARTICIPANT CONFIDENTIALITY

Your name, and your school and district's names will not be associated in any publication or presentation with the information collected about you or with the research findings from this



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Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

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It is possible, however, with internet communications, that through intent or accident someone other than the intended recipient may see your response.

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In the event of injury, the Kansas Tort Claims Act provides for compensation if it can be demonstrated that the injury was caused by the negligent or wrongful act or omission of a state employee acting within the scope of his/her employment.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to: Jane M. McManus, Department of Curriculum and Teaching, J.R. Pearson Hall, University of Kansas, Lawrence, KS 66045 or jmcmanus@ku.edu

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429, write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.



Type/Print Participant's Name

Date

Participant's Signature

Researcher Contact Information

Jane M. McManus
Principal Investigator
Department of Curriculum and Teaching
JRP Hall
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Lawrence, KS 66045
816-830-1608

Dr. Heidi Hallman
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Planning for the twenty-first century classroom: Teacher preparation and technology

INTRODUCTION

The Department of Curriculum and Teaching at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study is to better understand how pre-service teachers perceive their technology preparedness and technology application during their practicum experiences in the field.

PROCEDURES

The study will occur during the fall 2013 semester.

1. The educational technology course syllabi will be collected and reviewed.
2. There will be one (30-45 minute) interview with educational technology faculty in fall 2013.

All interviews will be audio-taped. Recording is required to participate. You may stop taping at any time. The recordings will be transcribed by me. Only I will have access to recordings, which will be stored digitally, password secured, and erased/destroyed in fall 2013.

RISKS

No risks are anticipated. Participants will be asked to give up some of their time to participate in interviews.

BENEFITS

The potential benefits to the faculty-participants are that they will have the opportunity to reflect upon their teaching practice and technology preparation, and share the stories of their teaching and teacher education program experience with the researcher and perhaps the public. This act of reflecting and sharing allows participants to become more critical and thoughtful regarding their pedagogical choices.

There are benefits to society, the teaching profession, and the fields of literacy and curriculum studies. These benefits include the understanding and portrayal of how pre-service teachers are prepared to infuse technology with teaching.

PAYMENT TO PARTICIPANTS

Participants will receive no payment.



PARTICIPANT CONFIDENTIALITY

Your name, and your school and district's names will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researcher(s) will use pseudonyms instead of your name, school and district names. Your identifiable information will not be shared unless required by law or you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

INTERNET STATEMENT

It is possible, however, with internet communications, that through intent or accident someone other than the intended recipient may see your response.

INSTITUTIONAL DISCLAIMER STATEMENT

In the event of injury, the Kansas Tort Claims Act provides for compensation if it can be demonstrated that the injury was caused by the negligent or wrongful act or omission of a state employee acting within the scope of his/her employment.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

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I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

Type/Print Participant's Name

Date

Participant's Signature

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Jane M. McManus
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Dr. Heidi Hallman
Faculty Supervisor
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338 JRP Hall
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Appendix 2:
TPACK Survey

TPACK Survey (Adapted from Schmidt et al., 2009)

Thank you for taking time to complete this questionnaire. Please answer each question to the best of your knowledge. Your thoughtfulness and candid responses will be greatly appreciated. Your responses will be kept completely confidential and will not influence your course grade.

Name: _____

Demographic Information

1. Your gender
 - a. Female
 - b. Male

2. Age range
 - a. 18-22
 - b. 23-26
 - c. 27-32
 - d. 32+

3. Major

4. Area of Specialization

5. Year in College
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior

6. University Educational Technology course instructor

7. Year of enrollment in Educational Technology course
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior

Technology Preparation and TPACK

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc. Please answer all of the questions and if you are uncertain of or neutral about your response you may always select "Neither Agree or Disagree"

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
TK (Technology Knowledge)					
1. I know how to solve my own technical problems.					
2. I can learn technology easily.					
3. I keep up with important new technologies.					
4. I frequently play around the technology.					
5. I know about a lot of different technologies.					
6. I have the technical skills I need to use technology.					
CK (Content Knowledge)					
Literacy					
7. I have sufficient knowledge about literacy.					
8. I can use a literary way of thinking.					
9. I have various ways and strategies of developing my understanding of literacy.					

PK (Pedagogical Knowledge)					
10. I know how to assess student performance in a classroom.					
11. I can adapt my teaching based-upon what students currently understand or do not understand.					
12. I can adapt my teaching style to different learners.					
13. I can assess student learning in multiple ways.					
14. I can use a wide range of teaching approaches in a classroom setting.					
15. I am familiar with common student understandings and misconceptions.					
16. I know how to organize and maintain classroom management.					

PCK (Pedagogical Content Knowledge)					
17. I can select effective teaching approaches to guide student thinking and learning in literacy.					
TCK (Technological Content Knowledge)					
18. I know about technologies that I can use for understanding and doing literacy.					

TPK (Technological Pedagogical Knowledge)					
19. I can choose technologies that enhance the teaching approaches for a lesson.					
20. I can choose technologies that enhance students' learning for a lesson.					
21. My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.					
22. I am thinking critically about how to use technology in my classroom.					
23. I can adapt the use of the technologies that I am learning about to different teaching activities.					
24. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.					
25. I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom.					
26. I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district.					
27. I can choose technologies that enhance the content for a lesson.					

TPACK (Technology Pedagogy and Content Knowledge)					
28. I can teach lessons that appropriately combine literacy, technologies and teaching approaches.					

Models of TPACK (Faculty, teachers)					
29. My literacy education professors appropriately model combining content, technologies and teaching approaches in their teaching.					
30. My instructional technology professors appropriately model combining content, technologies and teaching approaches in their teaching.					
31. My educational foundation professors appropriately model combining content, technologies and teaching approaches in their teaching.					
32. My professors outside of education appropriately model combining content, technologies and teaching approaches in their teaching.					
33. My cooperating teachers appropriately model combining content, technologies and teaching approaches in their teaching.					

	<i>25% or less</i>	<i>26% - 50%</i>	<i>51% - 75%</i>	<i>76%- 100%</i>
Models of TPCK				
34. In general, approximately what percentage of your teacher education professors have provided an effective model of combining content, technologies and teaching approaches in their teaching?				
35. In general, approximately what percentage of your professors outside of teacher education have provided an effective model of combining content, technologies and teaching approaches in their teaching?				
36. In general, approximately what percentage of the cooperating teachers have provided an effective model of combining content, technologies and teaching approaches in their teaching?				

Please complete this section by writing your responses in the boxes.

37. Describe a specific episode where a professor or instructor effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented.

38. Describe a specific episode where one of your cooperating teachers effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented. If you have not observed a teacher modeling this, please indicate that you have not.

39. Describe a specific episode where you effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content you taught, what technology you used, and what teaching approach(es) you implemented. If you have not had the opportunity to teach a lesson, please indicate that you have not.

Appendix 3:
Interview Protocol

I. Interview Questions—Pre-service Teachers

Initial Interviews:

The purpose of these interviews is to understand how the pre-service teachers perceive their preparedness for teaching English with technology.

1. As you begin this practicum experience, what types of technology do you hope to use?
2. What types of technology have you seen your cooperating teacher and/or students use?
3. In your experience as a pre-service teacher, what differences do you see when comparing the use of technology for a university assignment vs. the use of technology in an English classroom setting?
4. Describe an effective technology lesson that you have encountered in the teacher education program.
5. Some people say that you cannot fully prepare someone to teach with technology due to the changing nature of technology. How would you respond to them?
6. What are some ways that faculty can prepare pre-service teachers to teach with technology?
7. What are some ways that a cooperating teacher can help a pre-service teacher to teach with technology?
8. When do you think technology can be used effectively in the English classroom?
9. When do you think technology is not as effective in the English classroom?

10. To prepare pre-service teachers to use technology, what should an ideal teacher education program include?
11. What types of technology would you like to include in your future classroom?

Focus Group Interview:

The purpose of this focus group interview is to understand the varied experiences of the pre-service teachers during their practicum in the field.

1. Tell me about the practicum experience so far.
2. What types of technology are available in your practicum placement?
3. What types of technology are you using in your practicum placement?
4. How have the students responded to the technology that you have incorporated?
5. How does your cooperating teacher affect the use of technology in the classroom?
6. What major differences do you see when comparing the use of technology for a university assignment vs. the use of technology in an English classroom setting?
7. How would you like to include technology in the classroom throughout the rest of the practicum experience?

Reflective Interviews:

The purpose of these interviews is to understand the experiences of the pre-service teachers during their practicum in the field.

1. Tell me about your practicum teaching.
2. What types of technology did you use in your practicum placement?
3. How did your cooperating teacher influence the use of technology in your classroom?
4. In your experience as a pre-service teacher, what major differences do you see when comparing the use of technology for a university assignment vs. the use of technology in an English classroom setting?
5. Some people say that you cannot fully prepare someone to teach with technology due to the changing nature of technology. How would you respond to them?
6. When do you think technology can be used effectively in the English classroom?
7. When do you think technology is not effective in the English classroom?
8. What types of technology would you like to include in your future classroom?
9. What advice would you give to future practicum students?

II. Interview Questions—Practicum Supervisor

The practicum supervisor's interview provides additional insight to the pre-service teachers' individual responses. The purpose of the interview is to understand the perceptions of the supervisor regarding each focal case's technology infusion.

1. Tell me about your practicum supervising experience this semester.
2. Which classroom factors (available technology, cooperating teachers, etc.) have affected the pre-service teachers' practicum experiences?
3. How do you think that placement/classroom factors have affected the pre-service teachers' experiences?
4. How would you describe the differences in the pre-service teachers who effectively integrate technology vs. the pre-service teachers who do not effectively integrate technology?
5. What types of technology did you notice the pre-service teachers using the most this semester?
6. Describe a few classroom examples of pre-service teachers using technology to teach literacy skills.
7. How did students respond to the technology used in these lessons?

III. Interview Questions—Faculty of Educational Technology Course

The faculty interviews will occur after the syllabi analysis. In order to gain a more comprehensive view of the technology application, I will follow the syllabi review with the individual faculty interviews. The purpose of these interviews is to further understand how each construct of the TPACK framework is included in the educational technology course.

1. Tell me about the Educational Technology course and what your students can expect to encounter.
2. What are your major goals for students who enroll in the course?

3. What percentage of the course focuses on technology tool training and practice?
4. What types of technology tools or skills do you emphasize?
5. What percentage of the course focuses on content area teaching with technology?
6. Describe a few examples of your students utilizing technology for content area teaching.
7. Due to the dynamic nature of technology, some people say that it is difficult to prepare pre-service teachers for teaching with technology. What would you say to them?
8. How do you think this course will change in the next 3-5 years? 8-10 years?

Appendix 4:
Jill's Classroom Artifact

Jill's Introduction Poetry Assignment:

I AM POEM

I AM (Two characteristics/adjectives that describe you)

I WONDER (Something you are curious about)

I HEAR (An imaginary sound)

I SEE (An imaginary sight)

I WANT (A desire you have)

I AM (The first line of the poem repeated)

I PRETEND (Something you pretend to do)

I FEEL (a feeling about something imaginary)

I TOUCH (An imaginary touch)

I WORRY (Something that bothers you)

I CRY (Something that makes you sad)

I AM (The first line of the poem repeated)

I UNDERSTAND (Something you know is true)

I SAY (Something you believe in)

I DREAM (Something you dream about)

I TRY (Something you make an effort on)

I HOPE (Something you hope for)

I AM (The first line of the poem repeated)

Appendix 5:
Amy's Classroom Artifacts

A. Amy's Incan Empire Prezi Presentation

The image shows two screenshots of a Prezi presentation. The top screenshot is the main title slide, "The Incan Empire", which features a navigation diagram with four nodes connected by red arrows. The bottom screenshot is a slide titled "Rise of the Incas: Place and Location" with a bulleted list and a photograph of Machu Picchu.

Prezi Presentation Overview

Slide 1: The Incan Empire

- Navigation diagram showing four nodes connected by red arrows.
- Nodes include: "The Incan Empire", "Rise of the Incas: Place and Location", "The Incan Empire", and "The Incan Empire".

Slide 2: Rise of the Incas: Place and Location

- 1200 A.D. settled in Cuzco in the Andes
- Cuzco would become capital city
- Roads, bridges, and aqueducts

Image: A photograph of Machu Picchu, an ancient Inca city.

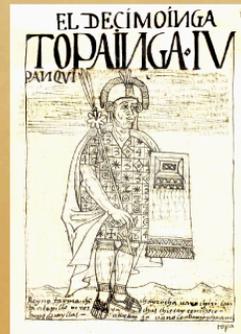
Rise of the Incas: Lifestyle

- Incas were farmers of maize
- Built great cities made of stone without modern tools
- Machu Picchu
- Government and records



Rise of the Incas: Military

- Pachacuti
- Topa Inca
- Conquered people and land



Rise of the Incas: Religion

- Polytheistic
- Practiced human sacrifice
- Inti
- Viracocha





Make a copy Share Embed Like

Public & reusable

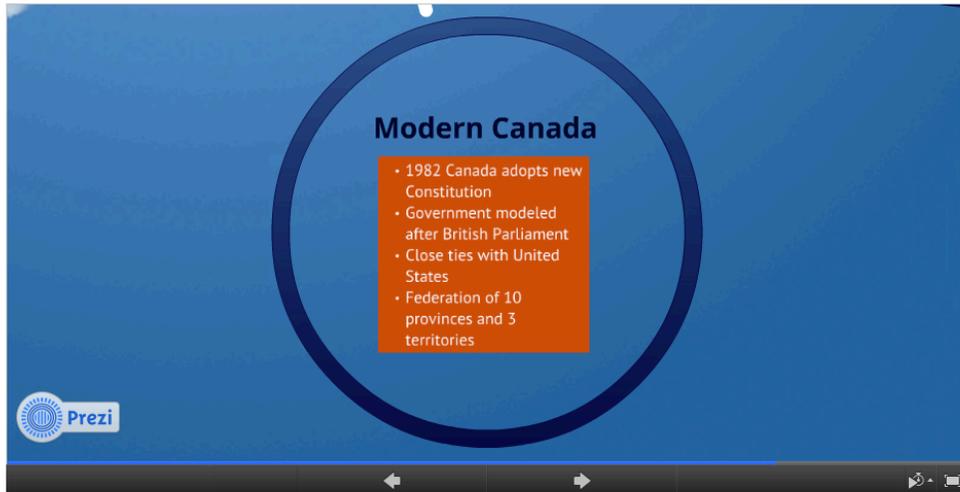


Canada's History

- Fur trade as source of conflict
- Seven Years' War (1756)
- Treaty of Paris (1763)
- Quebec Act
- 2 Colonies: Upper and Lower Canada
- War of 1812
- British North America Act
 - Made Canada a dominion: a self-governing area

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Modern Canada

- 1982 Canada adopts new Constitution
- Government modeled after British Parliament
- Close ties with United States
- Federation of 10 provinces and 3 territories

Prezi

Navigation icons: back, forward, search, and refresh.

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Appendix 6:
Mike's Classroom Artifacts

A. Lesson Plan—Twitter Assignment

Unit Title: Native American Literature

Length of Lesson: 43 minutes

Guiding Questions

1. Why, specifically, are the characters (esp. Rowdy and Cole, possibly Junior) angry?
2. What voice is the author using? How does he achieve it?

Standards and Benchmarks

1. **RL.8.1** — Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
2. **RL.8.4** — Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.
3. **W.8.6** — Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

Measurable Objectives

1. TSWBAT discuss the authorial voice and word choice using their text and notes on the six traits of writing.
2. TSWBAT participate in a meaningful conversation about the text with the teacher and other students.
3. TSWBAT compose a tweet summarizing the characters' emotions in 140 characters or less.

Overall Goals of the Lesson

Anticipatory Set

Students will receive and take a five-question comprehension quiz upon entering the room (see below). They will have 5-10 minutes to complete this. The teacher will then pass out the Twitter assignment and the class will briefly discuss the function of a social media service like Twitter.

Lesson Activities

The teacher will then break the students into two large groups according to their novel of choice. They will follow a teacher-led discussion pattern about the emotions of characters in their novels and the reasons for and descriptions of those emotions. Students will work on their Twitter assignment using some of these assignments, most importantly citing textual evidence in their claims.

Closure Activity

With remaining time, students will share their tweets. Students that don't finish will complete them for the next class period, and all students will be encouraged to

tweet at the teacher's account set up for this assignment, so that further conversations may be had.

Modifications

- Students who have not completed the reading may use one of the brainstormed emotions without contributing their own example, though they must still find textual evidence.
- Students without Twitter access do not need to send their tweet online.

Assessment

- Students will be evaluated on the results of their comprehension quiz.
- Students will be evaluated based on their contributions to the discussion; each student must provide one example from the book of a time when a character exhibited a particular emotion.
- Students will be evaluated on the parameters of the Twitter assignment sheet.

Resources

- Quizzes
- Twitter assignment sheet
- Computer, projector, and access to the internet
- Class copies of *Touching Spirit Bear* and *The Absolutely True Diary*
- Notebooks and writing utensils for note-taking

B. Twitter Assignment Sheet

Twitter Assignment

The characters in these novels are very emotionally charged. What emotions do you recognize as you read from a certain character's perspective, and what do you think caused he/she to feel these emotions? Write your character's name, the strongest emotion you see in him/her, and why he/she feels that way below. **Provide a specific example from the book, including the page number of your example!**

Ex: Harry Potter felt angry with his family because they neglected him while spoiling Dudley when they were growing up.

Your book: _____

Character: _____

He/she feels... _____

Because... _____

Page number: _____

Twitter is an example of social media; tools we use to communicate ideas, feelings, or shared interests online. Using **140 characters or less**:

1. Summarize your character's emotion and its source from his/her perspective.
(*ex:* feeling like my parents finally abandoned me on this Alaskan island!)
2. Provide your evidence from the book using the hashtag function
(*ex:* #chapter one)

Be prepared to explain why your tweet is a good summarization of your character's emotions!

View my profile page



140 Tweet