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Understanding Technological, Pedagogical, and Content Knowledge in an Educational Technology Course: A Case Study of Social Studies Preservice Teacher's Beliefs and Dispositions

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**Understanding Technological, Pedagogical, and Content Knowledge in an Educational
Technology Course: A Case Study of Social Studies Preservice Teacher's Beliefs and
Dispositions.**

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ABSTRACT

UNDERSTANDING TECHNOLOGICAL, PEDAGOGICAL, AND CONTENT KNOWLEDGE IN AN EDUCATIONAL TECHNOLOGY COURSE: A CASE STUDY OF SOCIAL STUDIES PRESERVICE TEACHER'S BELIEFS AND DISPOSITIONS

Mark M. Diacopoulos
Old Dominion University, 2018
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As beliefs and dispositions form the foundation of practice, the situations in which teachers develop belief is an important factor in their development (Roth, 1999). One aspect shaping the beliefs of teacher candidates is their experience with education. Lortie (2002) refers to this as the problem of “apprenticeship of observation”, the learning that occurs from watching teachers in the 12 or more years spent in school as a student. School experiences greatly affect the preconceptions teacher candidates have about teaching and learning. Richardson and Placier (2001) state most preservice teacher beliefs consist of unexamined assumptions. These views tend to focus on the affective quality of teachers they experienced, favorite teaching styles, and what certain children do. Teacher candidates tend not to think about the social contexts, subject matter, or pedagogy involved. Thus, preconceptions left unexplored are difficult to change later.

This qualitative case study investigates how a new iteration of an educational technology class influences the preconceptions, beliefs, and dispositions of five secondary social studies teacher candidates' implementation of Technological, Pedagogical, and Content Knowledge framework (Mishra & Koehler, 2006). The suitability of this class as a space to challenge teacher candidate preconceptions is discussed. Through interview, survey data, class observations, and student produced artefacts, issues of teacher candidate preconceptions, belief, and disposition

toward their future teaching are examined. How aspects of the class influenced participants' developing understanding of TPACK as well as challenging their beliefs about teaching social studies are discussed. Implications for teacher educators regarding teacher candidate belief, the learning of meaningful educational technology integration, and programmatic issues concerning appropriate course placement also arise because of this study.

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This thesis is dedicated my parents and family, who always told me I was clever, and encouraged me to pursue an education when I was unable to see the value of doing so myself. This thesis is also dedicated to all those who value the education process, our teachers and teacher educators whose impact shapes the world of tomorrow, and to our students whose quality of learning is paramount.

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CHAPTER 1

INTRODUCTION

Since the turn of the century, researchers have looked toward different uses of technology to transform classroom instruction in social studies (Hicks, Lee, Berson, Bolick, & Diem, 2014; Martorella, 1997; Schaffhauser & Nagel, 2016). Although there is potential for technology to impact teaching and learning in a transformative way, social studies teachers are traditionally reluctant to integrate technology, often using tools as a substitute for existing practice, or as a method to assist with administrative activities (e.g., Hartshorne & Waring, 2015; Reborá, 2016; Swan & Hofer, 2008). Moreover, as technology tools evolve at a rapid rate, it is difficult for researchers to adequately investigate and understand the impact of potential new technologies (Diacopoulos, 2017). How preservice social studies teachers learn to teach with technology is also problematic and complex (Hicks et al., 2014). This study will focus on identifying where the complex issues of teacher education are evident in how preservice social studies teachers learn to teach social studies with technology.

General issues which make teacher education complicated also effect the learning of social studies teacher candidates in relation to educational technology. For example, in this study I will show how teacher educators are often challenged to overcome the pre-existing beliefs of teacher candidates as shaped by their K-12 school experiences (Lortie, 2002). This challenge influences the learning of technology-infused social studies. Another issue at play in this study occurs as teacher educators use their research to practically influence teacher candidate's pedagogical decision-making. Questions about where the best space for learning technology is and what framework is best to achieve such learning are addressed. Ultimately, this study

investigates the learning of social studies teacher candidates and the challenges of teacher educators to overcome the barriers of teacher candidate belief, and bridge the gap between research and practice.

Throughout this study, I demonstrate how the issues of teacher candidate learning of technology integration in social studies are a microcosm of the larger complexities of teacher education. For this investigation, I frame the problem within the context of the Technological, Pedagogical, and Context Knowledge (TPACK) framework (Koehler & Mishra, 2009). By examining the learning of social studies teacher candidates, insight into general issues of preservice teacher learning and teacher education are gained. I will conclude by proposing ideas for consideration which may help address some of the complex problems revealed in this dissertation. Although the focus of this investigation is the interplay between TPACK, social studies and teacher candidate learning, findings will reflect already existing problems of teacher education. I will briefly highlight these issues in the next section.

Problems of Teacher Education

Teacher education is an important endeavor. Teachers subjected to quality preparation are more likely to be successful in the profession (Goodlad, 1999). Likewise, teachers who are poorly prepared are more likely to be poor teachers. Teacher education as a field is complex, uncertain, and difficult to understand (Labaree, 2004). Yet teacher candidates arrive in teacher preparation courses with over 12 years of perceived teaching experience gained as K-12 students, which results in a simplistic understanding of what teaching is (Labaree, 2004). Once they begin teacher preparation classes, they expect to learn actions and practices aligned with what they already believe constitute the act of teaching (Lortie, 2002). The disconnect between teacher

candidates' simplistic understanding and the complex realities of education are major problem for teacher educators to overcome.

Well-constructed teacher education courses should alleviate this problem. However, a common critique of teacher preparation is that education courses are “vapid, impractical, segmented, and muddled (or lacking direction)” (Tom, 1997, p. 3). Poorly constructed courses lend weight to the argument that teacher preparation is undervalued by both students and teachers alike (Darling-Hammond, 2006). If both teacher candidates and instructors undervalue the courses in which they teach and learn, this poses further problems and maintains the disconnect between the simplistic position of teacher candidates and the complex realities of teacher education. There is a case to be made that the disconnect is a symptom of a larger societal issue. High stakes environments in which teachers and teacher educators work leads to teacher education becoming a “neglected enterprise and teaching a marginal profession” (Goodlad, 1999, p. 3). The stakes are often not as high for teacher educators in research institutions whose priorities are research over teaching, whereas stakes are high for teachers whose success is measured by standardized tests in proscriptive curricula. Because they work in differing high stakes environments, the act of teacher education becomes a low priority for both teachers and teacher educators. For teacher candidates learning in university-based settings, education coursework is considered too theoretical and abstract to be of use for future teachers in K-12 learning environments (Labaree, 2004). Consequently, teacher candidates look toward their experiences as students in K-12 classrooms to provide necessary context for their pedagogical understanding (Britzman, 2003).

Moreover, the disconnect between the position of teacher candidates and the complexities of teacher education may be further explained as a structural issue. Traditionally, preservice

teacher learning is best described as a technical-rationality approach to teacher education (Schön, 1983). Historically, and in many places still, teacher education follows a training model in which universities provide theory, schools provide the setting, and teacher candidates provide the effort. Carlson (1999) called this the theory-to-practice approach. Korthagen (2008) described teacher education as a system in which experts, working predominately in universities, taught their knowledge to prospective teachers. This top-down model is one in which complex theories about teacher education meet the simplistic demands of teacher educators, creating a disconnect between expectations of researchers and the actions of teachers. According to Schön, the way in which teacher educators transfer theories directly influences the quality of the teacher trained. Thus, teacher educators are faced with the “perennial dilemma of teacher education: how to integrate the theory traditionally taught in university settings, with experience-based knowledge rooted in the realities of classrooms and schools” (Darling-Hammond, 2010, p. 235). Therefore, there is a perceived gap between what is learned in teacher education settings and what is taught in schools. Bridging this perceived gap is the complex challenge of teacher education.

To summarize, although teacher education is important it is often a low priority consideration for both teacher candidates and teacher educators alike. This may be due to societal influences as both teachers and teacher educators practice within differing high stakes environments placing the learning of teaching as a low importance area. Furthermore, if education courses are poorly constructed, then teacher candidates rely on their experiences as K-12 students to provide classroom contexts. As a result, they look for simplistic solutions to complex practices. Traditional models render university courses too theoretical to meet the practical needs of teacher candidates (Darling-Hammond, 2010). Consequently, the problem for teacher educators to solve is how to make the theory of teacher education, practical.

Solving Problems in Teacher Education

Complex issues of teacher education and research around them are discussed in greater detail in Chapter Two. However, so that we might better understand the context of the problem as it relates to this study, it is necessary to briefly visit potential solutions to the problems of teacher education.

So far, I have argued that there is a need for teacher educators to cultivate a better understanding of the reasons for a gap between what is learned in teacher education and what is taught in schools (Korthagen, 2008). Darling-Hammond (2010) describes this as the “perennial dilemma of teacher education” (p. 235). The problem of how to integrate the theory traditionally taught in university settings with experience-based knowledge rooted “in the realities of classrooms and schools” (p. 235). She contends that both the experience of practice, and the imaginings of theory, must be tightly coupled. This coupling is what Kennedy (1999) termed “the problem of enactment” (p. 359). For teacher candidates to solve this problem, they must do “more than simply having to memorize facts and procedures or even discuss ideas” (p. 359). Darling-Hammond proposed for teacher education programs to develop a coherent unifying vision through which every class, every instructor, and every teacher candidate is challenged to solve the problem of enactment.

However, an alternative method of connecting theory and practice is suggested by Korthagen (2008). Building on the work of Zeichner (1983), Korthagen argues that the most effective way to bridge the theory-to-practice divide is to focus on the personal nature of teacher learning and adopt constructivist practices. Through reflection, teacher candidates can build upon their understandings of what teaching is. This in turn should enable teacher candidates the opportunity to identify and find their own solutions to problems as they arise. However, this

approach relies heavily on the ability of teacher educators to cultivate reflective practices in their students, and Korthagen argues, teacher educators take for granted their traditional epistemic roles. If as we have seen, teacher learning is a low-priority for teacher educators, it follows that teacher educators are less likely to adopt an epistemology of reflection. This is problematic as Darling-Hammond et al. (2005) mention the role of reflection as crucial to developing curricular vision throughout teacher education programs.

Furthermore, Darling-Hammond, Hammerness, Grossman, Rust, and Shulman (2005) build upon vision and reflection as solutions to the problems of teacher education by outlining how a framework for teacher education could be enacted around the development of a vision. Other frameworks have been posited as potential foundations for developing teachers. For example, Shulman (1986) blended pedagogical and content knowledge into the Pedagogical Content Knowledge (PCK) model. This was later updated in 2009 by Koehler and Mishra who added the use of Technology, thereby submitting the Technological Pedagogical, and Content Knowledge (TPACK) model as a method of discussing teacher practice in relation to the use of technology in classrooms. Both models will be examined in more detail in Chapter Two.

As I will also explain in greater detail in Chapter Two, proposed solutions to the complex issues of teacher education are a blending of a unifying vision to bridge the theory and practice gap by using reflective practices within a framework for teacher learning. In this study, I specifically examine how teacher candidates are exposed to the TPACK framework to challenge their preconceptions and begin to blend theory and practice. Although not directly exposed to reflective practices, how teacher candidates develop their understanding of teaching in the form of a personal vision, or rationale, is also investigated.

Learning Technology in Social Studies

One problem scribed to social studies is that it resides in a sociopolitical landscape where social studies is marginalized in the curriculum, and compounded by a persistent lack of consensus about the meaning of social studies (Adler, 2008). Adler describes a landscape where competing ideologies within teacher education – professionalization, deregulation, and over-regulation – have added to an ongoing critiques of teacher preparation. This often leads to an approach by social studies teacher educators where the role of teacher as decision maker, developing their professional knowledge, or improving their judgment is not prioritized. Instead, “the focus was on skill application, not on teacher decision-making” (Adler, 2008, p. 331). Within the context of preservice teacher learning of technology in social studies, this focus is often replicated. For example, expressing a concern about the quality of instruction of technology-infused social studies, researchers posited that the social studies methods class is the best place where teacher candidates might learn to meaningfully integrate technology into their content (Brush & Saye, 2009; Hammond & Manfra, 2009). Their argument, consistent with Adler, was that standalone technology classes focused on the tools and skills teacher candidates needed to acquire to deliver content, rather than the development of teacher candidates’ ability to make meaningful pedagogical decisions about the teaching of social studies with technology. Although methods classes are well researched, their effectiveness as spaces in which teacher candidates learn to teach technology infused social studies is still uncertain. As a result, this study also investigates how a standalone technology class focused on pedagogical decision-making instead of on tools and skills that teachers need, as recommended by social studies researchers, can provide a suitable space for social studies teacher candidates to learn technology-infused social studies.

Purpose of the Study

The purpose of this study is to investigate the extent that an educational technology class addressed teacher candidate's dispositions and influenced their understanding of technological, pedagogical, and content knowledge (TPACK) (which for the sake of brevity will be referenced as "TPACK" in subsequent chapters). To do this I will focus attention on how their beliefs and preconceptions, shaped by their K-12 experiences, are challenged and possibly altered through their participation in the class. This is important to our understanding of the problem as teacher candidates already possess an existing opinion about good teaching garnered from their experiences of school as students (Britzman, 2003; Lortie, 2002). Issues of teacher belief will be addressed in greater detail in Chapter Two. This study will also describe the extent to which teacher candidates learned social studies content and pedagogy as well as their ability to implement technology as a tool to enhance social studies learning. My intention is to develop insight into the role of the educational technology class in the development of technological, pedagogical, and content knowledge (TPACK) in preservice secondary social studies teachers and how this interacted with their epistemological stance of preconception, beliefs, and predisposition. It is my hope for this investigation to add clarification to our understanding of the complexities of preservice teacher education, and the learning of social studies teacher candidates.

As already alluded to, there are many factors at play that influence the outcome of this study. However, to address these complexities, this study is framed around the following overarching research question:

- 1) How does participation in an educational technology class address issues of teacher candidates' prior beliefs, preconceptions and dispositions toward their understanding of technological, pedagogical, and content knowledge (TPACK)?

The Investigation

Although framed by only one research question, this investigation reveals insights about the extent to which an educational technology class serves as a learning space capable of meeting the needs of its teacher candidates. The focus of the investigation is on the learning of preservice secondary social studies teachers as they participate in a class designed for and taken by teacher candidates of multiple disciplines and age groups. As such, this study will afford readers an opportunity to compare the findings of this study with those of other researchers (e.g., Brush & Saye, 2009; Hammond & Manfra, 2009), who contend that the best place for social studies teacher candidates to learn to meaningfully integrate technology is in methods classes.

Furthermore, this study also gives researchers an opportunity to consider the extent to which classes such as the one in this investigation are suitable places to challenge or affirm teacher candidates' beliefs and bridge the theory to practice gap, thus overcoming issues of enactment.

This study uses the TPACK framework as a reference point from which preservice teacher understand of technology and subsequent learning is measured. The overlaps and interplays of each part of the framework are a mirror of the complexities of the educational technology class as a learning space. The role of the instructor in maintaining a balance between the complex demands of TPACK, and the instructor's vision for good teaching and learning also played a part in this investigation. Although the study addressed one research question, it is the interplay of a variety of factors that are revealed. Each subsequent chapter will help build the

case for understanding the complexities of preservice social studies teacher learning of technology integration.

Organization of the Study

This study is comprised of six chapters, references, and appendices. This introductory chapter, Chapter One, outlines the topic of the study: How an educational technology course influences secondary teacher candidate's preconceptions, beliefs, and dispositions toward their understanding and future enactment of TPACK. I place this topic within the context of the unfulfilled potential for technology to transform teaching and learning in social studies.

Additionally, I introduce issues pertaining to the learning of preservice social studies teachers as well as broader concerns about problems and potential solutions of teacher education. Within this context, I outline the purpose of this study is along with a broad research question. How this study deals with how teacher candidates learn about the complex interplay of the various factors of TPACK in their class experiences is briefly addressed before I conclude the chapter with an outline of how this study is organized.

Chapter Two is a review of the literature in two parts. I begin with an overview of the research into teacher education practices and frameworks from which good teacher education is established. The review starts with theories about teacher education juxtaposed with the importance of teaching content knowledge. From here, I address issues of teacher belief, including how teacher candidates use their preconceptions shaped from their school experiences to inform their beliefs and therefore influence their dispositions of teacher action. I then contextualize the problem of teacher belief within developed frameworks for teacher learning. The enactment phase, putting theory into practice, and the role of technology in education are also examined in part one of the review. It is here that theories about learning with technology,

TPACK as a framework and the research on TPACK are discussed. Part two focuses on the general issues of social studies teacher education and technology, the role of methods classes in infusing technology in social studies, and how preservice teacher belief is addressed in social studies methods instruction. From there, I report the specific research on technology in social studies teacher education, focusing mainly on the role of methods classes in teaching technology, and the critical research of technology teaching and learning in preservice social studies. I end Chapter Two with a look at future directions for research on the integration of technology on social studies preservice education. Overall, Chapter Two provides the research context from which this study can be positioned and better understood.

I address the methodological approach of this investigation in Chapter Three. A short contextual summary of pertinent research opens the chapter, providing a foundation from which this investigation is explained in more detail. I detail reasons for choosing case study as a research design along with examples of case study in education research and how case study is the best method to use for this investigation. The case, the researcher, the site, procedures for choosing participants, and data sources are all described in this chapter. I also describe how and when data was collected, as well as the types of data analyzed along with a detailed description of the two-stage method of analysis. Issues of trustworthiness and limitations are then described, and I conclude the chapter with a summary of the methodology.

In Chapter Four, I provide a contextual overview of the study. I describe the case of the educational technology class in detail. Lesson content, topics covered, and learning outcomes are also described here. I also provide an overview of the five participants in the study in this chapter. Their biographies provide an understanding of their preconceptions and beliefs at the outset of the course, and their initial beliefs and understandings of the various aspects of the

TPACK framework is briefly addressed to provide a baseline from which the rest of the study is built. Finally, I conclude with information about the course instructor including her aims and objectives.

I outline the findings of the study in detail in Chapter Five. Each finding is built on the context provided in Chapter Four. How the technology class influenced participants' understanding of TPACK, their development of rationale and vision, how the class influenced pedagogical decision-making, and subsequent challenges to participants' preconceptions, beliefs, and predispositions, form the main findings for this study. I report the findings with specific focus on how participants interacted with the class content, developed understanding of TPACK, and redefined their beliefs and dispositions through their participation in the class.

Finally, in Chapter Six I discuss the extent to which preconceptions, beliefs, and dispositions were challenged, and the potential for these shifts in understanding are speculated upon. Additionally, the findings undergo further evaluation in relation to the context provided in the literature review in Chapter Two. The focus here is on whether these findings further our understanding of how teacher candidates' preconceptions, beliefs, and dispositions are influenced as they learn aspects of TPACK in their content. In Chapter Six I also address other significant issues arising from the study, such as suitable placement of the class in the overall course structure, and the ongoing contention about where preservice social studies teachers best learn TPACK. After this, recommendations for future research directions are proposed from which I then conclude the study with proposals for future action which would help to address some of the issues arising from this investigation.

However, before I get into issues arising from the study. It is necessary to develop a deeper understanding of the problems and proposed solutions to issues of teacher education, how

these issues are evident in social studies, and how these issues influence the learning of technology infused social studies. I will explain these factors in the next chapter.

CHAPTER TWO

THE LITERATURE REVIEW

To better understand how an educational technology course influences secondary social studies teacher candidates' preconceptions, beliefs, and dispositions relating to their understanding of TPACK, it is necessary to examine the existing research literature. Through examination of theories about teacher education it is possible to develop an overall understanding of the complex nature of teacher education. This inquiry begins by ascertaining what researchers contend are the characteristics of a good teacher. Understanding what makes a good teacher provides a theoretical set of ideals or aims from which this dissertation can operate. Using theoretical ideals as a starting point, I then examine research about how teachers learn to teach. I then address ideas about what teachers need to know, for example constructivist practice and content knowledge. I then examine the growing literature on the important role of teacher beliefs which are delineated into preconceptions, beliefs, and dispositions, demonstrating the stages through which teacher candidates develop their pedagogical stance. In the first section of the literature review, I will show how researchers view teacher belief as a problem which needs further study.

This section of the literature review will also explain how addressing preservice teacher belief alone is not enough to support good teaching. Consequently, in the next section of the literature review I examine scholarship about models for teacher education, before addressing issues of enactment, or how teacher candidates turn theory into practice. With an intent that this study should add to the developing scholarship of preservice teacher learning, the next section of the literature review addresses the role of technology in education and preservice teacher learning in general. This section begins with research about theories on teacher learning and Educational Technology, focusing on the role that the Technological, Pedagogical, and Content

Knowledge (TPACK) framework plays in teacher education in general.

The second part of the literature review is focused on how technology is taught to social studies teacher candidates. The consensus of technology research in social studies education places a heavy emphasis on the role of methods classes to best teach preservice social studies teachers how to integrate technology into their pedagogy. Similarly, researchers also emphasize the methods class as a forum for addressing issues of preservice teacher belief. What this means for the teaching of technology to social studies teacher candidates is addressed as well as examples of research and critiques about the learning of technology in teacher education settings. The last section of the literature review discusses issues of technological integration and the role of the TPACK framework in social studies, outlining possible future directions and alternative frameworks that merit investigation.

Part One: Teacher Education

Learning to Teach – The Characteristics of a Good Teacher

This review of the literature begins with the assumption that a good teacher educator exists to produce good teachers. If this assumption is true, it is first and foremost important to develop an understanding of what makes a good teacher. Bransford, Darling-Hammond, and LePage (2005) define the kinds of knowledge, skills, and professional commitment teachers need to have. Consistent with the position of Dewey (1902, 1938) who argued that all people can be educated if they are provided with sustained encouragement incorporating quality academic materials in conjunction with interacting with diverse people and situations, Bransford et al. (2005) explain that the teachers' role is to generate activities which engage students' powers to understand, explain, and come to terms with new academic knowledge.

It is the role of the teacher to construct opportunities in the classroom that facilitate student learning. A teacher's ability to construct learning opportunities depends largely on the

capacities they possess in the categories of knowledge, craft skills, and dispositions (McDiarmid & Clevenger-Bright, 2008). These capacities can be combined into four models that describe a good teacher. These are, according to Sockett (2008), the Scholar-Professional, the Nurturer-Professional, the Clinical-Professional, and the Moral-Agent Professional. The Scholar-Professional is a teacher that emphasizes the skills and practices which promote their content or subject matter. The Clinical-Professional is a teacher whose expertise in pedagogy is greater than perhaps their emphasis in other areas. The Nurturer-Professional focuses their work on the development and care of the children in their charge, while the Moral-Agent Professional teaches with an emphasis on teaching toward a specific purpose or greater good.

These models are consistent with the opinion of Howard and Aleman (2008) who align these qualities with the skills necessary for teachers to attain National Board Certification. Howard and Aleman describe the skills teachers need as a commitment to students and their learning: knowledge of their subject and how to convey this to their students; responsibility for managing and monitoring student learning; systematic thinking and reflection about their practice; and the ability to be members of a learning community. Additionally, good teachers must be able to deal with diversity, have a deep understanding of subject matter, and knowledge of strategies that address the needs of different learners (Futrell, 2008). This means that good teachers must be culturally responsive (Villegas & Lucas, 2002), and possess a social justice mindset that values “diverse human experiences and enables learning for all students” (Darling-Hammond, 2005, p. 35). These values are harmonious to the goals of an educational system within a democratic society, which Sikula (1996) describes as “principles of non-repression and nondiscrimination” (p. 35).

Teaching, therefore, is more than achieving understanding, it is also a moral enterprise, “not merely because teachers provide ethical instruction but also because they decide what learning is worthwhile for students” (Feiman-Nemser & Buchmann, 1986, p. 107). As such, good teachers must possess a working combination of Sockett’s (2008) models, be knowledgeable in their content and knowledgeable of their students, be skilled in pedagogy, be culturally responsive, and their practices should match the goals and values of a democratic society. These are lofty qualities so it follows that producing good teachers is not an easy task for teacher educators.

Theories about Teacher Learning

Core Values

If the aspiration of creating a good teacher is difficult to achieve, then “Being a teacher educator is often difficult” (Korthagen, 2008, p. 8). It is an obvious assumption that teacher education programs aspire to produce good teachers. To support such obvious programmatic aspirations, teacher educators should aim to construct learning around a set of core values or themes (Feiman-Nemser, 2008). Feiman-Nemser conceptualizes four themes that underscore the interconnectedness of content and contexts in learning to teach. These are learning to think like a teacher; learning to know like a teacher; learning to act like a teacher; and learning to feel like a teacher. As we can see, these themes directly mirror Sockett’s (2008) models. Like Sockett, Feiman-Nemser contends that these four themes should all be present in teacher preparation programs. Failure to address these themes would end up producing under-prepared educators. Furthermore, leading programs “regarded the growth of teachers as inseparable from the growth of persons, in both humanistic and critical/social terms” (Rodgers & Scott, 2008, p. 698). Going beyond Feiman-Nemser and Sockett, Rodgers and Scott contend that if teacher educators are to

create good teachers they must acknowledge the importance of the growth of the teacher as a personal, social, and critical self. More about identity construction as situated in the understanding of teacher beliefs will be examined later in this chapter. However, if we want our future teachers to aspire to good pedagogical practice, Feiman-Nemser themes of learning to know and learning to think like a teacher are particularly important.

For these theories of teacher learning to be further understood, how they interplay with the foundational assumptions of constructivist teaching, balance the demands of content knowledge, and then wrestle with issues of teacher identity in the form of teacher beliefs, need investigation. I will begin with a brief overview of what constructivist teaching is and how it pertains to our investigation of teacher learning. I will then address why content knowledge is important as an accompaniment to constructivist learning. Finally, I will explain how Rodgers and Scott's (2008) contention for an understanding of teacher identity can be addressed if we examine teacher belief. However, teacher belief is a problematic field, as the subsequent section will attempt to explain.

Constructivist Teaching

The models of Sockett (2008) and themes of Feiman-Nemser (2008) should produce good teachers whose practice is rooted in constructivist teaching. According to Richardson (1997), constructivist teaching is not a monolithic, agreed upon concept. Rather, it is at its core a learning, or meaning-making theory. The suggestion of constructivist teaching is individuals make meaning based upon what they already know and believe along with the new phenomena or concept that they encounter through their learning experiences. Constructivist teaching and constructivism is a descriptive theory of learning. Constructivism explains how people learn but is not a prescriptive theory to explain how people should learn. Therefore, it is possible to argue

all learning is fundamentally constructivist. Whether a student is listening to a lecture or conducting an experiment, they are still developing their own, sometimes idiosyncratic, understanding. In this way constructivism provides a “lens through which to examine the world” (MacKinnon & Scarff-Seatter, 1997, p. 51).

Constructivism as a concept has its roots in Piagetian constructivism in which it is assumed learners come to classrooms with understandings that need to be adjusted or completely altered. How these understandings are addressed will also be described in a later section on teacher beliefs. In Piagetian constructivism, the role of the teacher is to facilitate the building of new understandings by designing experiences and questions that raise dilemmas for the students. One extension of Piagetian constructivism is sociocultural constructivism. In this model both perception and action work together to understand a variety of interpretations which are useful for different purposes and in different contexts. Richardson (1997) explains that in sociocultural constructivism, knowledge is not a received entity, it is constructed by doing activities within a community of people.

According to Tom (1997), prospective teachers should teach from a constructivist pedagogical orientation. They should aim to “foster learning that is personally meaningful and intellectually complex” (p. 77). However, if their instructors “summarize information and ideas from the discipline of educational psychology” (Tom, p. 78), they are unlikely to adopt a cognitive approach that is constructivist. Tom further explains how teacher preparation should not be about procedural knowledge but instead integrate moral and subject issues with the concerns of novices. Along these lines, he asserts the importance for a moral focus to supplement pedagogical knowledge. Richardson (1997) builds upon Tom’s approach to call for methods classes in which “multiple perspectives are respected, presented and worked through” (p. 9).

If teacher educators are to produce constructivist minded teachers, they need to model constructivist practices. However, teacher educators are also tasked to teach in a manner which does not ignore course content or subject matter being taught. As Richardson states, meeting this “challenge will require considerable inquiry into the nature of constructivist teacher education and the effects on the way students think about teaching and eventually teach” (p. 11). This means that as much as teacher educators should model a constructivist approach in their instruction of teacher candidates, they still have a responsibility to instill important content knowledge.

Content Knowledge

As well as adopting a constructivist approach to instruction, mastery of content knowledge is an important factor in the development of good teachers. Thus, classes that deal with subject matter (for this dissertation these shall be referred to as “methods classes”) must be effective in addressing these characteristics (Cochran-Smith & Zeichner, 2005). This is as true in elementary teacher preparation as it is in secondary (Grossman, Schoenfeld, & Lee, 2005). However, it is important that methods classes do not focus on “mechanistic applications and view knowledge as a form of technical rationality” (Britzman, 2003, p. 31). However, problems occur when student teachers do not know what to do. According to Britzman they look to “teaching methods as the source rather than the effect of pedagogy...positioning pedagogy as tricks of the trade” (p. 227). What Britzman describes that when strategies in methods classes are taught or learned in isolation of an overarching constructivist theory, or attention to the models of Sockett (2008), or Feiman-Nemser (2008) themes, then teacher candidates are unable to effectively apply their knowledge successfully. Moreover, Britzman states many professionals perceive knowledge as acquired through an accumulation of classroom experience rather than an

“intellectual, emotional, and esthetic challenge” (p. 229). To avoid this, Britzman (2003) argues good methods instruction should be dialogic in nature and acknowledge the complexity of teaching.

I established in Chapter 1 that teaching, and learning to teach is not self-evident. As teaching is complex teacher candidates should be prepared to acquire content knowledge in a complex, dialogic, and constructivist paradigm. However, Britzman (2003) describes how teacher candidates view teacher knowledge as the acquisition of classroom experiences. In general, preservice teacher beliefs ignore the need to develop metacognitive habits of mind which guide decisions and reflection in the habit of continual improvement (Jackson, 1974). This makes the job of teacher educators more complex. To stress the core values of Feiman-Nemser (2008) and maintain a balance between content knowledge and constructivist teaching seems almost impossible, especially as many professionals only value the knowledge they gained from classroom experiences (Britzman, 2003). It follows, therefore, that teacher candidates’ beliefs about their learning of teaching need to be addressed by teacher educators.

Teacher Beliefs

If teacher educators aim to produce teacher-candidates who are rooted in the core values of Feiman-Nemser (2008), and able to adopt constructivist teaching practices, while balancing the demands of content knowledge, then teacher educators need to address and make sense of teacher beliefs, which are, according to Pajares (1992), “a messy construct” (p. 307). Even with definition, it is difficult to generalize using research on teacher beliefs alone. Adler (2008) makes a claim for acknowledging the importance of preservice teacher beliefs, but admits there is little research examining the connections among teachers and their contexts, or the impact upon learners, when beliefs are accounted for. Zeichner (2005) calls for more research into the

complex relationships about how teacher educators teach, how teacher candidates enact their pedagogical practice, and the effect this has on their students. Moreover, researchers tend to use words pertaining to teacher belief interchangeably, words such as belief, disposition, vision, rationale, preconception, and misconception are sometimes used to mean the same thing.

Therefore, to better make sense of the messy construct of teacher beliefs, I intend to break beliefs down into three parts: preconceptions, beliefs, and dispositions. Once delineated, it will be necessary to further investigate the problems of teacher belief, and how teacher educators are tasked with addressing them. I shall begin with the what will become the first stage, preconceptions.

Defining preconceptions. Before gaining an understanding teacher belief, it is necessary to define that which causes beliefs:

Prospective teachers have preconceptions that affect what they learn from teacher-educators and in-classroom experiences. These preconceptions come from years and years of observing people who taught them and using this information to draw inferences about what good teaching looks like and what makes it work. (Hammerness et al., 2005, p. 367)

Therefore, preconceptions are the thoughts and ideas that come first. They are obtained through experiences. Researchers who examine teacher belief describe how teacher candidates' preconceptions form from their experiences as students. Moreover, these preconceptions usually lead to a couple of broad misconceptions held by teacher candidates: Firstly, teacher candidates perceive teaching to be easy. Secondly, concepts and ideas surrounding teaching are already familiar to teacher candidates, so they have already formed clear beliefs associated with these concepts even before they enter an education program (Hammerness, Darling-Hammond et al.,

2005). If these beliefs do not align with the aims of good teacher education, then they can be problematic for teacher educators to overcome.

Defining belief. If preconceptions are the thoughts and ideas that come first, what comprises teacher beliefs? Beliefs are informed from preconceptions, and in this context, are opinions associated with various educational issues. Roth (1999) explains teacher belief systems are related to broad issues such as equality, the social agency of schools, education in a democracy, and the worth of the individual. He claims that what teachers believe about students are significant in relation to student performance. Therefore, a teacher candidates' preconception may inform their beliefs, which may in turn influence their opinion about any number of educational issues. As education and schooling are sociopolitical acts they are open to interpretation. How teacher candidates interpret these sociopolitical aspects form the basis of their intention to enact their beliefs. These are described as teacher dispositions.

Defining dispositions. Roth (1999) further asserts dispositions derive from a teacher's belief systems. These beliefs relate to a wide range of attitudes and approaches to a variety of issues. Because dispositions are attitudinal, they influence preservice teacher's attitudes toward educational issues like inquiry, self-development, reflection, and equality. Thus, a preservice teacher's understanding of how students learn are rooted in his or her dispositions. Dispositions provide insight into what a teacher might think about their own or their students' performance, or how their instruction is planned and analyzed, and what their attitudes are regarding instructional improvement. However, dispositions, which are precursors to habits and behavior, are often ignored by teacher educators (Hill-Jackson & Lewis, 2010). How teacher candidates' preconceptions about their learning of teaching influence their beliefs about educational issues, which in turn effect their disposition to educational actions and pedagogical decisions, is at the

heart of teacher education. Before teacher educators can implement core values, constructivist teaching, or address content knowledge, they must try to resolve the problem of teacher belief. Yet, according to Hill-Jackson and Lewis (2010), this is an area often ignored by teacher educators. It is imperative to further define the problem of teacher belief to get to the heart of what a teacher educator needs to impact teacher learning.

It should be noted that our participants for this study are yet to engage in formal or informal lesson planning or enactment. As a result, they are at the predisposition stage. As they progress and interact with the course content, their predispositions will take shape in the form of proposed teacher actions – dispositions. So, for this dissertation both words will be used to mean the same thing. Teacher candidates intended enactment of their preconceptions and beliefs.

The Problem of Teacher Belief

As beliefs and dispositions form the foundation of practice, the situations in which teachers develop belief is an important factor in their development (Roth, 1999). Roth contends colleges and universities provide the best forum for beliefs to be explored and developed. However, a larger factor shaping the beliefs of teacher candidates is their experience of education. This is referred to by Britzman (2003) as “school biography.” Based on Lortie’s (2002) concept of “apprenticeship of observation,” Britzman explains that teaching is “one of the few professions where newcomers feel the force of their learning” (p. 1), as it informs them of the relevancy of their work. Britzman argues that every person has a school biography, so there is a generally held belief that educational experience is the best teacher for teachers. Reliance on school biography leads to the development of three cultural myths: “everything depends upon the teacher, teachers are self-made, and teachers are experts” (p. 7). Overfamiliarity with teaching ensures that from the outset, teacher candidates take for granted they know what a good teacher

is and does. Pedagogy is not accounted for by students. Instead, a teacher's skills are assessed by what student can see. As each student has their own conception of what teaching really is, Britzman argues that teacher candidates hold individually situated experiences of teaching that articulate their beliefs. Often missing from these beliefs are the "many kinds of knowledge, unseen plans, and backstage moves – the skunkworks – that allow a teacher to purposefully move a group of students from one set of understandings and skills to quite another over the space of many months." (Bransford et al., 2005, p. 189).

Apprenticeship of observation. Britzman's (1983) concept is consistent with Lortie's (2002) description of the problem of "apprenticeship of observation." Lortie refers to the teacher learning that occurs in the 12 or more years spent in school as a student. School experiences greatly affect the preconceptions teacher candidates have about teaching and learning.

Richardson and Placier (2001) state most preservice teacher beliefs consist of unexamined assumptions. These views tend to focus on the affective quality of teachers they experienced, favorite teaching styles, and what certain children do. teacher candidates tend not to think about the social contexts, subject matter, or pedagogy involved. Thus, preconceptions left unexplored are difficult to change. Consequently, the beginning teacher is desperately searching for "tricks of the trade which will help that person organize the students and induce them to learn" (Tom, 1997, p. 135).

Indeed, teacher candidates' beliefs often do not simply extend beyond knowledge related concerns. Beliefs influence understanding of moral issues, conceptions about children, subject matter and how they are related. If teacher candidates are exposed to close examination of what it means to teach through experiencing subject matter in methods courses which are different to how they learned as students, it is hoped this might assist some teacher candidates to be more

critical of the methods of instruction they received as students themselves (Ball & Cohen, 1999; Darling-Hammond, 2006; Tom, 1997). Therefore, there is a case for teacher education courses to purposefully challenge apprenticeship of observation and engage in “pedagogical thinking” (Feiman-Nemser & Buchmann, 1986; Tom, 1997).

Moreover, apprenticeship of observation is not limited to educators; laypersons have also experienced it. The effect is most people believe they know how to teach, “because we watched teachers for many years. We understand children because we were once children ourselves, and we may have our own children. We know K-12 content because we took the required courses in school” (Darling-Hammond et al., 2005, p.169). Even in teacher education there are, according to Goodlad (1999), many teacher educators who believe teachers learn best on the job. Goodlad claims skills can be gained in-service, but there also needs to be a basis from which to grow. Without this beginning point, ill-prepared teachers suffer from high rates of drop out where consequentially “Children and society are the ultimate losers” (p. 4). This is a position also supported by Darling-Hammond (1999, 2006) who states that on the job training leaves teachers underprepared.

One reason experience is not enough preparation is the curriculum often changes (Darling-Hammond, Banks, et al. 2005). This is an example of the type of uncertain demand placed on teachers. The art of teaching involves embracing these uncertain and often conflicting demands that, according to Britzman, exceed the sum of a preservice teacher’s school biography therefore making the act of becoming a teacher problematic. Thus, it is suggested another role of teacher preparation is to help teacher candidates make sense of their biography and educational narratives, thereby equipping them to better understand pedagogical ideas and approaches

(Britzman, 2003; Tom, 1997). However, as Lortie (2002) asserted, a few alterations in approach will not undo centuries of tradition.

Identity development and vision. So, if teacher educators are going to manage the complex issues surrounding teacher belief, programs cannot adopt a “one-size-fits-all approach” (Hammerness et al., 2005, p. 369). Teacher educators must adopt different approaches for different individuals. It is here where identity development, mentioned previously by Rodgers and Scott (2008), would be most effective. Programs would offer experiences that challenge and support “teachers in confronting and changing their practices and conceptions” (p. 749). As Darling-Hammond et al. (2005) argue, identity development should be viewed as an “ethical necessity.” Programs containing a coherent vision of teaching and learning throughout have greater impact on initial conceptions and practices of prospective learners.

A way to develop vision is for teacher candidates to be encouraged to understand their ideological position through a process of critical reflection. Critical reflection would enable the prospective teacher to be better prepared to address complex issues such as social justice and diversity (Hill-Jackson & Lewis, 2010) but would entail a long-term approach which “explicitly seeks to elicit work with novice teachers’ initial beliefs and concerns” (Hammerness, et al., 2005, p. 369). Hammerness et al. suggest critical reflection was the most successful approach to take. Giroux (1988) further explains how teacher beliefs are a force to understanding practice, and therefore merit further exploration. Nevertheless, little can be gained from forcing students to reject their preconceptions. As Loughran and Russell (1997) state, experience precedes full understanding. Thus, it becomes essential for teacher educators to “meet them on their own terms” (p. 164) to acknowledge, develop and challenge teacher candidates’ various perspectives. Furthermore, Loughran and Russell, consistent with Schön (1983), argue that preservice

education should “help student teachers develop their ‘thinking about teaching skills’ so that they are encouraged to learn though and from their experiences” (p. 164).

So far in this section of the review, I have described how teacher educators need to embrace the core values described by Feiman-Nemser (2008). They should encourage constructivist teaching and balance this with a strong emphasis on content knowledge. However, according to Britzman (2003) many professionals place greatest emphasis on what they experienced in the classroom when K-12 students. These experiences, described by Lortie (2002) as “apprenticeship of observation,” challenge teacher educators to address preservice teacher preconceptions, beliefs, and dispositions. I explain how teacher educators must both account for and address the misconceptions caused by teacher candidates’ apprenticeship of observation, while acknowledging they operate in a context where every layperson believes they have a similar level of expertise as teacher educators do. Hammerness et al. (2005) suggest one method for addressing preservice teacher belief is for teacher candidates to critically reflect about their learning and what they believe. In the next section of this review, I will further examine the challenge of overcoming the problems of teacher belief in a constructivist manner by describing how frameworks for teacher learning provide the necessary structure.

Frameworks for Teacher Learning

As the previous section explained, before teacher educators can address constructivist teaching, values driven education, or issues of appropriate content knowledge in their teacher candidates, they must first find ways to overcome problems of teacher belief. teacher candidates enter their teacher preparation programs having already served an apprenticeship of observation which already shaped their preconceptions, beliefs, and dispositions to action. Thus, teacher educators face a foundational challenge of addressing issues of teacher identity. However, this

doesn't happen in a vacuum. Paradigms, systemic structures, and frameworks can also provide support for effective teacher education. This section of the review will describe how.

Models and Paradigms

Zeichner (1983) describes four paradigms of teacher education. The first is behavioristic and emphasizes the development of specific and observable skills assumed to help effective learning. The second is personalistic with a focus on the psychological maturity of teacher candidates. The idea behind the personalistic paradigm is to reformulate perceptions and beliefs over mastery of content and behavior. Traditional-craft is Zeichner's third paradigm, where education is viewed as an apprenticeship with skills learned through experience. The last paradigm is inquiry-oriented teacher learning. This paradigm emphasizes the learning about teaching and inquiry into the contexts of where it happens. Zeichner adds that in their professional development, teacher candidates are often exposed to multiple iterations of each paradigm. Milam (2010), quoting Pinar (2004), further develops Zeichner's paradigms explaining that teacher education is more complex than Zeichner's four paradigms describe. Milam contends teacher education must be reconceived from a "skills-identified induction into the school bureaucracy to the interdisciplinary, theoretical, and autobiographical study of education experience in which curriculum and teaching are understood as complicated conversations toward the construction of a democratic public sphere" (Milam, 2010, p. 3).

A framework for understanding teaching and learning. Constructing learning in a democratic public sphere is the aim of the framework devised by Bransford, Darling-Hammond, and Le-Page (2005) in Figure 2 below. In this framework, Bransford et al. summarize the knowledge teacher candidates need if they are to help their students learn in a democracy. Bransford et al. contend that a combination of content knowledge, curriculum knowledge, and

pedagogical knowledge form the basis for an individual teacher's vision of professional practice. Their framework illustrates the interplay between factors to create pedagogical content knowledge. Their vision of professional practice provides a focus on decisions about what to teach and why. It also brings into play the social purposes of schooling which are sometimes overlooked.

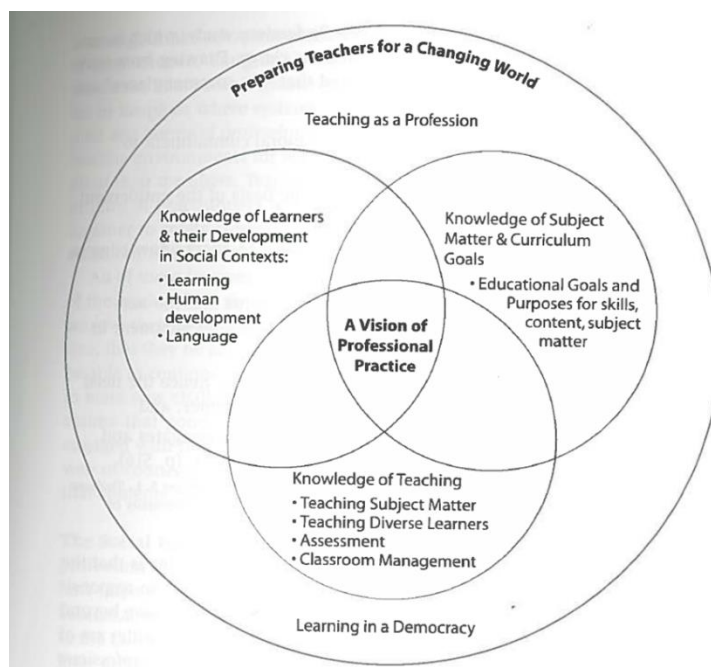


Figure 2.1 A Framework for Understanding Teaching and Learning (Bransford, Darling-Hammond, & LePage, 2005, p.11).

Bransford, Darling-Hammond, and LePage (2005) designed a framework which expands upon three principles of teacher education that are driven by a need for teacher candidates to understand teaching in a way that is different from their experience (Darling-Hammond, 2010). Firstly, teacher candidates already have preconceptions about how education works. These preconceptions were developed during their “apprenticeship of observation” and if not addressed may lead teacher candidates to fail to grasp the new concepts and information presented to them in their instruction. Alternatively, they may adhere to new ideas only to pass their classes, later

reverting to preconceptions once outside of the learning environment. Secondly, teacher candidates need to develop competence in an area of learning that allows them to “enact” what they know. Enactment is rooted in a deep foundation of factual and theoretical knowledge. With an understanding of facts and ideas in a conceptual framework, and an ability to organize knowledge to help students access and remember. Lastly, teacher candidates need to develop a metacognitive approach to instruction. This will help them to understand the complexities of teaching in diverse classrooms (Hammerness et al., 2005).

The conception of teacher preparation held by Bransford et al. (2005) is like one proposed by Goldhaber and Brewer (2000), who argue how pedagogical training, particularly in methods courses, are strong predictors of student achievement gains. They suggest learning how to teach allows teachers to better use their knowledge of what to teach. They further argue methods courses are important in this model because the level of pedagogical content knowledge teacher candidates acquired is dependent upon their methods experiences. However, these experiences do not occur in a vacuum. teacher candidates learn better in learning communities (Hammerness, et al., 2005). Indeed, Darling-Hammond and Bransford (2005) further designed a model illustrating how learning can occur (see Figure 2.2 below). In this model, learning should develop in social contexts, connecting subject matter, strategies, and educational goals with “the demands of content and the progress of students” (p.111).

Learning to teach in a community. The implication made by Darling-Hammond and Bransford (2005) is that new teachers learn to teach in a community which enables them to develop a vision for their practice; a set of understandings about teaching, learning, and children; dispositions about how to use this knowledge; practices that allow them to act on their intentions and beliefs; and tools that support their efforts.

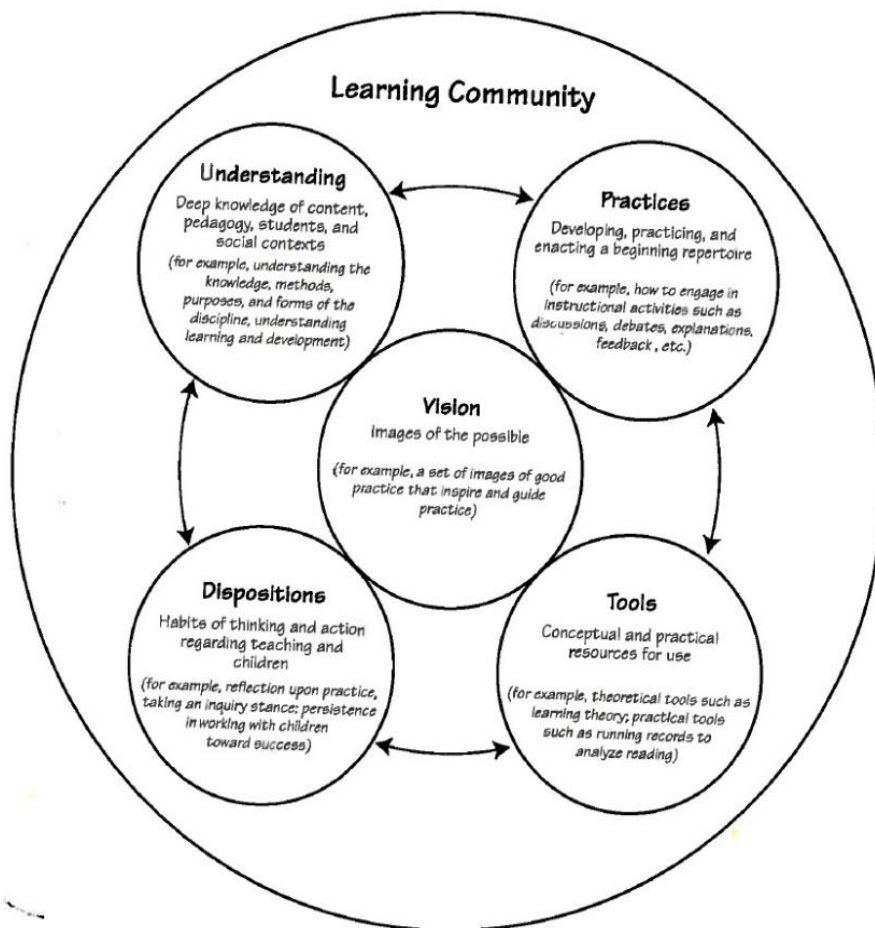


Figure 2.2. Learning to teach in a community. (Darling-Hammond & Bransford, 2005, p. 386).

Darling-Hammond and Bransford (2005) further advocate for teacher educators to assist teacher candidates in their learning from the act of teaching within their communities. They state this needs to be a lifelong commitment in which reflection and inquiry play an integral part of the activity of teaching. Thornton (2005) also suggests teachers, in their role as instructional gatekeepers, must necessitate careful consideration of their purposes for teaching. Like Darling-Hammond and Bransford (2005), Thornton argues this preparation is both foundational and career-long.

Frameworks such as the two mentioned previously emphasize how good teacher education programs consider the preconceptions and beliefs of teacher candidates. Both content knowledge and pedagogical knowledge are equally important factors in the development of teachers. An emphasis on the careful consideration by the preservice teacher of what it means to teach is also required. I will discuss the development of a vision, or rationale, in the preservice teacher in detail later in this chapter. However, as the frameworks demonstrate, how pedagogy and content knowledge are applied is equally as important.

Pedagogical content knowledge (PCK). A more specific framework which focuses on the learning of teachers, both pre- and in-service, is the pedagogical content knowledge framework (see figure 2.3 below). Shulman (1987) describes how understanding pedagogical knowledge needs to be combined with understanding content knowledge. He explains how teachers need to “understand deeply, not only the content that they are responsible for, but how to represent that content for learners of all kinds” (p. 202). Shulman argues the most effective teachers knew more than their subject matter and more than just good pedagogy. He asserts teachers also know how students understand, and misunderstand their subjects. Effective teachers know how to check for these misunderstandings, and how to deal with them when they arise.

The most regularly taught topics on one’s subject area, the most useful forms of representations of these ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations – in a word, ways of representing and formulating the subject that make it comprehensible to others. Pedagogical content knowledge also includes an understanding of what makes the learning of specific topics easy or difficult the conceptions and preconceptions that students of different ages and backgrounds bring

with them to the learning of these most frequently taught topics and lessons. (Shulman, 1986, pp. 9-10)

Shulman's argument is important because it implies that teacher must be mindful of the levels of pedagogical content knowledge their student teachers possess.

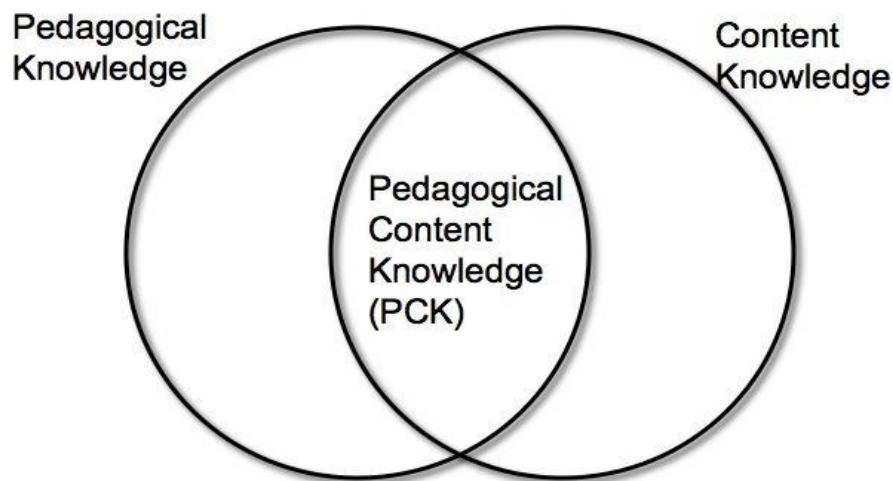


Figure 2.3 Pedagogical Content Knowledge (PCK), (Shulman, 1986).

Although pedagogical content knowledge is attributed to Shulman, the concept is not new. Dewey (1902) talked about a need to psychologize subject matter to connect disciplinary knowledge to student experience while Conant (1963) noted the importance for prospective teachers to understand subject matter from a more pedagogical perspective. More recently, Wilson, Floden, and Ferrini-Mundy (2001) support pedagogical content knowledge (PCK) through the assertion that courses in education were as important as content courses for teacher preparation. Furthermore, they note the need to develop pedagogical content knowledge in a subject was more likely to be addressed in subject matter methods course rather than a general

education course. Grossman, Schoenfeld, and Lee (2005) added to this point, explaining each subject has a different concept of what PCK would look like. For Darling-Hammond (2006), PCK was a factor considered in the creation of both versions of her frameworks (Figures 2.1 & 2.2). She argues teacher educators would have to pay attention to the core of PCK, which she states is the development of vision and values. She explains:

How to develop what a teacher thinks is the “stuff” of learning and the nature of teaching is one of the greatest dilemmas of teacher education, especially since most teacher education programs begin where the candidate’s many years of learning subject matter leave off. (p. 88)

Darling-Hammond implies it is up to teacher education institutions, and teacher educators, to address pedagogical content knowledge, to develop a vision for good teaching in their teacher candidates, and to help them carry this intention into their pedagogical practice. More recently, Powell (2017) in his examination of PCK in social studies, calls for a “marriage of deep subject matter knowledge, with knowledge of the contexts of teaching, and the teaching strategies most likely to enable students to learn about subject matter being taught” (p. 9). He calls for classes and courses to immerse students in an environment where instructors demonstrate pedagogical skills enabling teacher candidates to consider teaching methods, content, and context. Powell’s call is for teacher educators to be mindful of how best to put Shulman’s theory in practice. How researchers describe the problem of enactment, is the next section of this review.

The Problem of Enactment: Theory into Practice

Issues of enactment and problems with connecting theory learned in a university or college setting, with the practices enacted by teachers in the classroom, reside at the core of this investigation. For example, in social studies preservice education, teacher enactment is an acute issue, influenced by socio-political curricular decisions, and leads to a marginalization in

importance (Adler, 2008). How teacher educators contend with the complexities of teacher education, and the socio-political challenges of social studies education is under constant consideration in social studies journals. But at the general teacher education level, even when illustrated as frameworks such as those in Figures 2.2 and 2.2, teacher education remains complex and difficult to understand. It necessitates deeper research to develop a greater understanding of how to better prepare teachers. Therefore, before investigating how to better prepare social studies teachers, it helps to understand a little about research in teacher education in general.

Understanding Teacher Education

The process of teacher education itself has traditionally been a haphazard affair. It was not until the development of normal schools, teacher institutes, and later, colleges and academies, that there was specialized preparation for the profession (Fraser, 2007; Goodlad, 1990). Loughran (1997, 2007) acknowledges how little progress is made toward understanding the pedagogy of teacher education while Zeichner (1999) points out a “lack of attention for what actually goes on in teacher education” (p. 4). Bransford, Darling-Hammond, and LePage (2005) assert that research on how teachers engage in successful practices is in many ways the newest area of research, with application of this knowledge still being worked out.

Around the turn of this century, there was an increase in case study research of education programs. Zeichner (1999) notes how these studies help to understand programs from a faculty or student perspective. A consistent theme of this research is how difficult it is to change preservice teacher’s beliefs and attitudes. Adler (2008) credits case study and self-study as growing methods of research that are useful in revealing more about teacher belief and attitudes. She points to self-study as a method that has potential because self-study is the intentional and

systematic inquiry into one's own practice by those who prepare teachers (Dinkelman, 2003).

The benefit of this type of research is it can develop reflective practice in teacher educators, who in turn will develop reflection in their teacher candidates. Potentially, a deeper understanding of teacher education practices is achieved through applications of case study and self-study methodology. In this emerging field, this is achieved by making tacit theories of teacher education public and explicit, while carefully studying and reflecting upon those beliefs and practices (Adler, 2008).

With this in mind, as I further examine social studies, technology and teacher education in part two of this chapter, I will pay attention to studies, mainly case studies, advocating integration of technology into social studies teacher education and methods classes. The studies mentioned pay close attention to what is happening in teacher education classrooms. However, as we shall see they too have limitations. But before investigating the research on integration of technology into social studies preservice education, it is pertinent to begin examining theories pertaining to technology instruction and preservice education in general, before focusing on social studies research literature.

Educational Technology

Between 2001 and 2008, over \$4 billion was invested by the federal government annually into K-12 school technology (Swan & Hofer, 2008). However, despite this investment, it appears the pedagogical revolution touted for by researchers like Cuban (2001) did not happen. In fact, it is reported that teacher practice is not enhanced by technology use, rather it is reinforced. This is also the case in social studies where teachers often use technology to replicate traditional practices (Roberts & Butler, 2014). Technology alone has not moved pedagogical practice toward a more student-centric approach, as originally hoped (Swan & Hofer, 2008).

Theories About Teacher Learning with Technology

Complementing her theories explaining how teachers learn best when enacting pedagogical content knowledge in communities, Darling-Hammond (1999) also offers a theory for the role of technology. She asserts teachers require further education around curriculum resources and technologies. Teachers, she said, need to be able to connect students with sources of information that go beyond textbooks. Their role should be facilitators for inquiry-based learning, helping students use information to solve problems rather than as a facilitator who enables students to remember information in sources.

Darling-Hammond et al., (2005) argue for the use of technology to achieve a constructivist paradigm of teaching. As curriculum is planned, so the role of technology should be considered. The potential for technology to be transformative for teaching has not yet been realized, but the emphasis of building a technology ready infrastructure by school districts is having some effect. Darling-Hammond et al. make strong arguments why technology should be used by teachers. First, there is a societal need to prepare future citizens for a technology rich world. Schools and teachers have been tasked to help close gaps in access and understanding (the digital divide). Second, teachers should be assisting students in finding materials, critically analyzing information, and participating in global communities. Third, technology provides tools which are useful in doing a subject. Teachers should equip students to use these tools in context. Additionally, technology can help with reflection and improvement (metacognition) by both students and teachers. Therefore, for widespread change to occur, teachers “need to incorporate the opportunities of the emerging technological infrastructure into their overall curricular thinking” (p. 199). For teacher education programs, this means they should aim to produce

technically literate teaching professionals who have a set of ideas (i.e., a purpose, vision, or rationale) about how their students should be able to use technology within disciplines. Darling-Hammond et al. also recommend technology tools should be infused in the courses of teacher education programs, especially the content methods classes. This can be achieved through adoption of what has become known as the TPACK model.

TPACK and Research on Technology and Teacher Learning

Technological, Pedagogical, and Content Knowledge (TPACK) can be described as the blending of technology with pedagogical content knowledge. It requires a “thoughtful interweaving of all three key sources of knowledge: technology, pedagogy, and content” (Mishra & Koehler, 2006, p. 1029). TPACK is built upon Shulman’s (1987) PCK model. Shulman acknowledged the interplay between content and pedagogical knowledge. Mishra and Koehler (2006) take this concept further by fundamentally dividing the complex nature of teaching with technology into seven domains (see Figure 2.4 below). There are the two large domains of pedagogical knowledge, and content knowledge, already explained by Shulman. Added to these is that of technological knowledge. This is the knowledge needed by a teacher to use information technology. Then there are three overlapping domains. There is the overlap between pedagogical knowledge, and content knowledge. This would be the area where Powell (2017) describes the marriage of content knowledge with the skill to be able to effectively teach that content. For example, in social studies, this might be where a teacher is able to effectively construct an inquiry lesson using primary sources. Where content knowledge and technological knowledge overlap, that is the blending of a technological skill for use in content. For example, in a social studies classroom, the teacher might use a digital repository such as the Library of Congress, to search for and use primary sources for a lesson. Where the pedagogical knowledge and

technology knowledge domains overlap, this would be where teachers successfully use technological tools to facilitate instruction, for example using shared documents and digital rubrics for students to self-assess their learning.

The most important domain is the one in the center of the framework. This is where all three, technological, pedagogical, and content knowledge, are at play. An example of this in social studies might be where a teacher has students create an authentic product, such as a podcast or documentary movie, using primary sources, and working in collaborative groups. To do this the teacher needs to demonstrate a working knowledge of technology tools, understand how to create and manage collaborative groups, and successfully scaffold learning using primary sources.

The interactions between technology and PCK are complex and challenging for teachers who have varying levels of knowledge and expertise in technology, pedagogy, and content (Hofer & Swan, 2008-2009). Often teachers tend to adopt technocentric strategies, focusing on a tool or skill, rather than a TPACK approach. But adopting technocentric strategies may be because teachers are already challenged by other factors affecting their pedagogical decision-making, such as standards implementation, diverse student needs, or a professional development focus on a certain skill (Harris, Mishra, & Koehler, 2009). Therefore, it is imperative for teacher educators to be mindful of all these factors when introducing their teacher candidates to technology.

Nevertheless, TPACK should be considered an essential element of teacher education. For example, Brown and Cato (2008) call for “schools, colleges, and departments of education to engage their professors, cooperating teachers, and teacher-students in constructive exploration of and dialogue about the flow of technological pedagogical content knowledge in facilitating high-

quality, effective instruction for all learners” (p. viii). Brown and Cato posit that TPACK should be a central element at all levels of teacher preparation. Because technology evolves so quickly, how students best learn with technology needs to be constantly re-evaluated. Niess (2008) argues “Tomorrow’s teachers must be prepared to rethink, unlearn and relearn, change, revise, and adapt” (p. 225). By adding technology to Shulman’s model, teacher educators are charged with an extra layer of complexity. They must equip their future teachers to be able to effectively teach pedagogy and content, with technology, and create teachers who are flexible enough in their approach to be able to adapt their learning and stay current for their students.

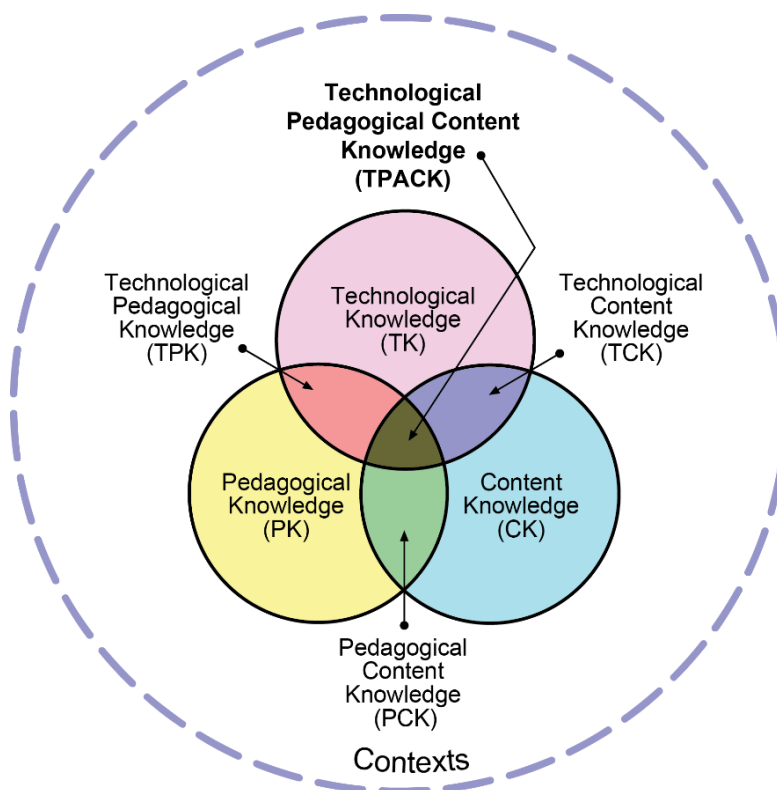


Figure 2.4. Technological, pedagogical, and content knowledge. (TPACK). (Koehler and Mishra, 2012) Reproduced by permission of the publisher, © 2012 by tpack.org)

TPACK in research. TPACK provides researchers with a way of looking at a complex phenomenon and to move beyond simplistic, advocacy approaches to technology integration

(Koehler, Mishra, & Cain, 2013). The TPACK model affords researchers with opportunities to investigate technology integration through a structured lens. However, TPACK itself offers researchers a “wicked problem” (Mishra & Koehler, 2006, p. 11). As with all things technological, requirements and innovations constantly change. So where should research on TPACK start? Mishra and Koehler acknowledge “while attempting to solve a wicked problem, the solution of one of its aspects may reveal or create another even more complex problem” (p.11). As a result, researchers attempt to “clarify and develop a more robust and mature understanding of the TPACK framework and what it means for preparing teachers to guide student learning with technologies” (Niess, 2011, p. 308). Unfortunately, as researchers look to better understand aspects of TPACK, the framework itself has undergone misuse (Cavanagh & Koehler, 2013).

For example, although TPACK is intended to be used as a conceptual framework, a way for educators to consider technology integration in the classroom, some researchers chose to investigate how best TPACK might be used as a quantitative measure (e.g., Cavanagh & Koehler, 2013). They describe TPACK as a complex concept and imply that using it as a measurement of technological pedagogical proficiency may be too simplistic and limiting. Meanwhile other researchers made qualitative attempts to analyze in depth each of the TPACK domains (e.g., Cox & Graham, 2009). Recommendations from these analyses are that TPACK should be investigated further as an instructional framework in schools, as a method of measuring the level of integration of educators (e.g., Thomas, Herring, Redmond & Smaldino, 2013; Zelkowski, Gleason, Cox, & Bismarck, 2013), and as a tool for acquiring knowledge about professional development, particularly teacher candidates.

In contrast, Abbitt (2011b) cautioned researchers that although there has been progress made in using TPACK as a measurement tool, not enough research has occurred to determine if there are any norms to apply to teacher candidates' TPACK levels. Similarly, Shinas, Yilmaz-Ozden, Mouza, Karchmer-Klein, and Glutting (2013) caution there is still a considerable lack of clarity about the TPACK framework, which can make the use of these instruments problematic. They describe a resultant need for further investigation into the use of TPACK as a measure of technology integration. Furthermore, Koehler himself has hinted in conversation that the conceptual framework was never intended to be used this way.

Nevertheless, a survey instrument was successfully developed measuring TPACK quantitatively in each domain (Schmidt et al., 2009). This instrument was utilized by multiple studies and assisted in the investigation of TPACK as a tool for teaching teacher candidates, as a model basis for curriculum development in methods classes in multiple contents (Keeler, 2008; McGrath, Karabas, & Willis, 2011), as an evaluation tool in a laptop infused program (Hughes, 2013), or as a model for integration in content areas such as science, special education, and mathematics (Habowski & Mouza, 2014; Lyublinskaya & Tournaki, 2014; Polly, 2014). By using TPACK to infuse technology integration in methods classes, researchers found teacher candidates at their institution moved from a state of knowing “how to use technological tools, they seldom knew how to utilize those tools in educational contexts” to learning to enhance and refine content learning (Keeler, 2008, p. 29). It was also noted that content experts who teach methods classes will improve on their level of TPACK in environments where they are encouraged to infuse it into their instruction (Foulger, Buss, Wetzel, & Lindsey, 2015). Schmidt et al.'s instrument is described in more detail in Chapter 3, as an adaptation of it is in use for this study.

However, even with an emphasis on the TPACK model, teacher candidates tend to remain teacher-centric in their instruction, or, as discovered in a rare longitudinal study, focused on the technology tool rather than pedagogy (Hofer & Grandgenett, 2012). There is a need for more longitudinal research to build on the findings of case studies conducted thus far (Hughes, 2013) and a call for studies which triangulate self-report and performance measures over multiple years in the field (Hofer & Grandgenett, 2012).

Consistent with the literature in social studies discussed later in this chapter, general education researchers recommend all teacher educators use TPACK to prepare teacher candidates to “transparently and ubiquitously integrate technologies into their content specific classrooms” (Keeler, 2008, p. 29). However, as with most frameworks, TPACK is not a panacea. TPACK does not help teachers to learn in a community setting (McGrath et al., 2011), nor does it address the problem of teacher beliefs (Niess, 2011). Indeed, Niess (2011) advocates for investigation of teacher beliefs in relation to the implementation of technology in content areas as meriting specific attention, and others agree (e.g., Abbitt, 2011b; Holland & Piper, 2014). Their investigations into preservice teacher self-efficacy and motivation show that contrary to the usual trend, TPACK-infused methods instruction increases preservice teacher self-efficacy in technology integration. These findings have implications for addressing teacher belief as they imply that a TPACK-infused curriculum helps address some negative preconceptions about technology-infused instruction.

Conversely, a significant critique of TPACK is that it is too vague and free of pedagogy to be truly meaningful to educators (Brantley-Dias & Ertmer, 2013). TPACK does not really address what teachers need (which is both complex and varies for everyone), nor does it really

promote learning. Technology integration is not the same as technology enabled learning which, Brantley-Dias and Ertmer argued, is more powerful.

As a relatively new conceptual framework, TPACK is just beginning to be understood. Although it has flaws, it is currently the best model for identifying and investigating the factors teachers need to consider when making curricular decisions. It is the author's contention that adopting the TPACK model in preservice education classes will better equip teacher candidates to make well informed instructional decisions about their use of technology. Focusing instruction on the question "Why do I want to use this technology?" (Nelson, Christopher, & Mims, 2009, p. 82), and placing the how to teach with technology alongside the why, can help teacher candidates make the difficult decisions necessary of instructional gatekeepers. Moreover, future research on TPACK must, as Niess (2011) stated," truly intersect technology, pedagogy, content-technological pedagogical, and content knowledge for TPACK amidst quality teaching and learning in the 21st century, where information and communication technologies have become increasingly accessible and valued for educational purposes" (Niess, 2011, p. 314).

Part One Summary

In part one of this chapter, I addressed issues about what a good teacher should be and how teacher education programs and teacher educators can better teachers. Teachers need to be well-versed in pedagogy and able to display in-depth content knowledge. Teacher educators, therefore, need to adequately equip teacher candidates to navigate the complexities of education in general and teaching as a profession. I also discussed problems and misconceptions which arise out of the preconceptions, beliefs, and dispositions acquired by teacher candidates through their prior experience of apprenticeship of observation.

Furthermore, I have described how misconceptions can be addressed if teacher educators adopt a reflective approach to preservice teacher's existing experiences and how these experiences shape their learning. Teacher educators should create opportunities for teacher candidates to practice metacognition and make pedagogical decisions about their teaching. Theoretical frameworks were described which call for development of a vision, or rationale, of the preservice teacher at the core of all instruction. A powerful framework, Shulman's pedagogical content knowledge model (seen in Figure 2.3) is not considered by some researchers nowadays to be sufficient to create good teachers who can meet today's societal and technological demands. Therefore, the technological, pedagogical content knowledge (TPACK) model merits consideration as a tool for helping teacher educators better prepare good teachers. Part two of this chapter will revisit many of these themes in the context of preparing teachers of social studies.

Part Two: Teacher Education in the Social Studies

In the first part of this literature review I focused on how researchers determine how strong teacher education programs should in general should follow Shulman's PCK concept and reflect the aims of Darling-Hammond and Bransford's (2005) views on understanding teaching and learning. Effective teacher education should aim to bridge the theory and practice gap by encouraging teacher candidates to create a vision for their practice, and use reflection to learn from their experiences, while technology integration should occur by infusing TPACK into methods instruction. Shulman's emphasis on PCK helped shift the focus from skill development to helping teacher candidates make pedagogical decisions while engaged in learning about teaching. All these have implications for social studies teacher education. For example, if Shulman's model is to be successfully implemented, key pedagogical decision-making in the

social studies content needs to be addressed in methods classes as well as general education courses. When expanding Shulman's model to TPACK, this implication is also true.

Technological knowledge needs to be a part of educational coursework.

Unfortunately, there is a strong case that teacher education programs do not do enough to integrate pedagogical content knowledge coherently in their program structures. Journell & Tolbert (2016) argue that programs often separate the two, with content knowledge covered through specific classes in history, sociology, political science, and geography. Often taught in a Humanities or Arts and Letters college, while the pedagogical knowledge is covered in the educational coursework. This makes for a challenge and disconnect when trying to connect the two and a subsequent problem for instructors of social studies methods. This adds to the contention about the quality of preservice social studies education and the extent to which pedagogical decision-making occurs in social studies teacher training (Powell, 2017). Powell further argues that some researchers have attempted to connect social studies to PCK (e.g., Ormrod, 1996; Whitson, 2004), but this is difficult because social studies itself is made up of multiple disciplines. Others have used specific examples of practice to discuss aspects of PCK, for example Van Sledright (2011, 2013) examined how historical thinking interplays with teacher practice, but this is a rare example. Powell's reasoning for this lack of understanding is that social studies itself is hard to define, and has too many goals and purposes, which in turn leads to teacher learning separating content knowledge from pedagogy.

Powell (2017) illustrates well how social studies researchers find it hard to investigate the interplay between pedagogy and content knowledge in the multiple content areas and contexts that create social studies. This makes the role of social studies teacher educators even more complex. In the next section I will discuss social studies how research into how educational

technology should be learned, the complexities of social studies as a subject, and TPACK as a framework pose many problems.

Social Studies Teacher Education and Technology

Earlier in this chapter I established that teacher education researchers attempted to make sense of the complexities of teacher education by providing frameworks that illustrate the combination of factors necessary to best educate teacher candidates. In terms of social studies education, a basis for good social studies instruction was conceptualized by Doolittle and Hicks (2003) who posit a series of principles for teacher educators to follow. They note, “Teachers must develop a pedagogically reflective ability to identify and utilize strategies to effectively address and unpack student misconceptions” (p. 86). They contend technology integration in the social studies could help reduce misconceptions. Their point is technology use can facilitate inquiry, provide real world relevance, foster local and global interaction, build on students’ prior knowledge and interests, and can be used by teachers to provide timely and meaningful feedback. They add that ultimately technology can promote autonomous, creative, thinking. Their principles for teaching social studies with technology is generally consistent with the principles of the TPACK model (Koehler & Mishra, 2009).

I also established earlier in this chapter how teacher beliefs play an important role in preservice teacher education. Similarly, in social studies, teacher candidates possess preconceived ideas about what makes a good social studies practitioner. Often these are affective traits, such as “character,” “caring and committed,” or “powerful” (Crowe, Hawley, & Brooks, 2012). Preconceptions play a key role in helping social studies teacher candidates to decide, among other things, whether to adopt new technology into their practice (Saye & Brush, 2006). Despite calls for methods classes to infuse technology, there is little evidence to suggest this

approach has been adopted, and when it has, success is dependent upon “scaffolding, or teacher facilitation and questioning” (Swan & Hofer, 2008, p. 313). Swan and Hofer contend most teacher candidates researched before 2008 were not able to effectively integrate technology into their instruction. Swan and Hofer call for more investigation into the area of preservice teacher belief in social studies, and particularly more research into preservice teacher belief regarding technology implementation. The claims of Swan and Hofer need to be examined in more recent contexts, for example, the growing ubiquity of technology in society and how that effects teacher candidates’ enactment of social studies with technology. Where social studies technology implementation is best learned is yet to be fully determined, although the next section outlines the important role of methods classes.

The Role of Methods Classes

According to Adler (2008), research on social studies methods classes is based almost entirely on action research and self-study initiated by teacher educators. This is still true for much research on social studies methods over the last decade. As Powell (2017) alluded, social studies are fragmented and complex, so it follows that research into methods classes will cover diverse topics. For example, Wynn and Okie (2017) investigated how preservice secondary teachers learn about problem based learning in methods classes. Bafumo and Noel (2014) describe three technology strategies introduced in their methods classes, while Martell (2017) examined the beliefs and practices of his teacher candidates toward race. An (2017) shared her experiences of preparing her methods students to navigate edTPA, while Fitchett, Starker, and Salyers (2012) investigated the self-efficacy of their methods students toward culturally responsive pedagogy. Perspectives of methods students to intercultural education initiatives was investigated by Casey (2016), while Lucas and Passe (2016) researched perspectives on students

with disabilities in social studies methods textbooks. Meanwhile, Logan and Butler (2013) examine their own learning as doctoral students teaching social studies methods. As Adler alluded, research into social studies methods is mainly based around a case study methodology (e.g., Martell, 2017; Powell, 2017; Wynn & Okie, 2017), with some examples of action research (e.g., An, 2017; Fitchett, Starker, & Salyers 2012) or self-study (e.g., Logan & Butler, 2013). Meanwhile Adler contends that more would be gained if researchers track their impact from college courses into the K-12 classroom, one example of which, Wright and Wilson, (2009), I will discuss in greater detail later in this chapter.

Research into the role of social studies methods classes is varied in content and application. This reflects the complex nature of social studies as a discipline, and the problems teacher educators face when designing instruction for methods classes. As I explained in the earlier discussion of teacher education in general, underlying social studies methods instruction is the ongoing problem of teacher belief. However, teacher belief in social studies has merited investigation. In the next section I will focus on examples of research pertaining to teacher belief in social studies education.

Preservice Teacher Belief in Social Studies

Drawing on Lortie's (2002) apprenticeship of observation, Slekar (1998) contextualizes preservice social studies teachers as "reflexively conservative." This is a state in which preservice social studies teachers are resistant to change their beliefs or preconceptions, and subsequently reluctant to change their ideas about what constitutes good social studies practice. Consistent with general research on teacher education described earlier, Slekar encourages the use of reflection to challenge the limiting effect of preservice social studies teachers' existing stance. His recommendation is for social studies teacher educators to counterbalance this stance

by adopting an adventurous pedagogical approach. Again, this is consistent with existing research. For example, Doppen (2007) examined whether participation in methods classes affects preservice teacher beliefs in any way. His case study on the inclusion of inquiry-based practices found teacher candidates were somewhat influenced by the methods class, but more influenced by their field experiences. Teacher candidates are willing to try to implement student centered learning, but did not believe they had enough experience to carry out complex, inquiry based learning. Doppen's study provides a good example of reflexive conservatism in action, positing a lack of confidence by teacher candidates as a reason for their stance.

Another reason teacher candidates give for non-implementation of a pedagogical concept is they often claim their students are not developmentally or morally ready for it (James, 2008). This reason is especially true when controversial issues are addressed. It becomes problematic when the preservice teacher has a strong predisposition based on religious doctrine (James, 2010). Consistent with researchers such as Dinkelman (1999, 2009), who argues for reflective practice to become a part of social studies methods instruction, and LaBoskey (1997), James suggests adopting a reflective approach that addresses teacher candidates' purposes as educators.

Wanting to gain further insight into social studies preservice teacher preconceptions, Crowe, Hawley, and Brooks (2012), find that teacher candidates believe first and foremost that a social studies teacher is an information giver. They also report how teacher candidates feel a need to be content knowledge experts. Crowe et al. explain preservice social studies teachers value the character or personality of their best social studies teachers, and they desire to be caring and committed. They describe their best social studies teachers as "powerful;" that is, they taught with a variety of instructional methods, connected content to students' lives, and promoted student engagement. But when it came to their practice, preservice social studies

teachers were often teacher- and content-centered in their pedagogy. In this study, Crowe et al. not only demonstrate the level of reflexive conservatism in teacher candidates, but also define what preservice social studies teachers considered to be good, affective teaching, as gained from their apprenticeship of observation. The common theme from this work is that teacher candidates seek to emulate their favorite social studies teachers (Chiodo & Brown, 2007).

Even when working with in-service teachers, epistemological stances play a crucial role in their potential for professional growth. For example, Stoddard (2008) described situations where teachers' preconceived notions about using digital media in their classroom limited their potential future use of such sources. He attributes this to multiple factors for example, the marginalization of history in the curriculum, the practice of interrogating primary sources, while not challenging secondary sources or textbooks, and an epistemology that media and film do not teach the correct story (Stoddard, 2017). As a result, he claims that it is a challenge for teacher educators to develop an acceptance of teaching with digital media by teachers as good social studies practice.

Regarding rationale development in social studies, the work of Dinkelman in advocating for reflective practice to develop rationale, was continued by Hawley (2010). In his study of first year teachers, he found that new teachers felt unsupported by the system when they wanted to enact their rationales. He described a perceptible enactment gap between their envisioned practice and what they do. He further argues that teacher candidate learning of content and pedagogical knowledge can be improved with the introduction of a purpose for teaching social studies as a foundation. (Hawley, 2012). How much an overt reference to rationale-development in coursework is a factor is evident in a subsequent study by Hawley and Crowe (2016) who examined the changing rationales of teacher candidates as they progressed through their

program. They found that those who were exposed to rationale development in their coursework were better able to articulate and convey a nuanced understanding of their purposes for teaching social studies than those who were not. Those not exposed to rationale based practices tended to rely on their apprenticeship of observation or fall back on a content delivery model of intended instruction.

The knowledge that preservice social studies teachers place content knowledge uppermost in their thoughts provides methods instructors with a place to start conversations with their students. Crowe et al., (2012) recommend teacher educators use this information to help students develop a purpose for their teaching, ultimately taking a rationale based approach. Similarly, Ritter (2013) addresses preservice teacher's preconceptions about citizenship and multiculturalism. He finds a disconnection between their viewpoint and the level at which they planned lessons. Overall, Ritter states teacher candidates plan more conservatively, once again demonstrating their reflexive conservative stance. Likewise, a mixed methods study by Hubbard (2013) found elementary teacher candidates were likely to neglect social studies instruction as it was not considered to be as important as other subjects in the curriculum. The perceived marginalization of social studies is yet another problem social studies teacher educators should address when working through preservice teacher beliefs.

This means social studies teacher educators have a difficult task overcoming the pre-existing beliefs of teacher candidates. teacher candidates' apprenticeship of observation makes them naturally conservative in their outlook. Teacher educators can adopt a mindset that views pre-existing beliefs as a barrier, or a habit that needs to be broken or adapted (e.g., James, 2008, 2010). Or, teacher educators can accept pre-existing beliefs are the foundation from which we can develop teacher candidates' understanding of social studies education and adopt a rationale-

based approach (e.g., Dinkelman, 1999, 2009). Dinkelman advocates using an approach that embraces teacher candidates' pre-existing mindset by asking them the question, "What do you teach *for*?" This simple question creates an opportunity to discuss the development of a personal rationale for teaching. Extending the question to "what do you teach social studies for?" as proposed by Hawley and Jordan (2014), guides teacher candidates to consider their rationale for teaching social studies. Both Dinkelman (2009) and Hawley and Jordan (2014) advocate this approach might go some way to alleviate preservice teacher resistance as developed by their apprenticeship of observation.

In this section, I have demonstrated that it can be argued that social studies researchers are concerned with how to address issues of teacher belief in social studies preservice instruction. In the next section, I will address the research on the role of technology in social studies, how technology plays a role in methods instruction, and how this learning connects to the TPACK framework and teacher belief.

Technology in Social Studies Education

Larry Cuban (2001) describes a situation where schools were advocating the use of technology, but teachers were not using it to do much more than replicate their existing pedagogical practices. He asked a question that placed social studies at the core of the discussion: "In what ways can teachers use technology to create better communities and build strong citizens?" (p. 197). Martorella (1997) concurs with this sentiment in his seminal piece that described social studies as a "sleeping giant" which could potentially awaken to a new world of technology use. He predicted a changing world where society learned visually, while the written or spoken word took second place, and where social studies instruction was at odds with these developments. His work was regarded as a wakeup call which prompted social studies

researchers to further examine how technology was used in classrooms. Social studies researchers acknowledge the modern classroom is potentially evolving into “an expansive learning environment extending beyond the walls of the traditional class setting”. Teacher educators of the 21st Century would have to “...seamlessly integrate educational technology and transfer innovations in instruction to teacher education pedagogy. As a result, teaching may become more creative with technology serving as a tool to enliven the process” (Berson, 2000, p. 128).

Research on Educational Technology in the Social Studies

Embracing this wakeup call, researchers in the social studies turned their attention to what was happening in social studies classrooms both at schools and at the college level, with a view to evaluate the extent that Martorella’s “sleeping giant” might potentially be awakened. Early examples of research were prompted by the creation of guidelines for using technology to prepare social studies teachers by the College and University Faculty Assembly (CUFA) of the National Council of Social Studies (NCSS). Mason et al. (2000) premise the key role of social studies educators is to model appropriate uses of technology for pre-service teachers.

It was in this context of advocacy for change that Friedman and Hicks (2006) conducted a review of literature concerning technology integration in social studies. In this study, they divided existing research into three categories. The first category was literature that discusses technology’s promise in the social studies. These were research that supported Martorella’s (1997) notion of social studies as a sleeping giant. Second were studies describing implementation in methods classes or in schools, and third were small scale qualitative studies examining how teachers or teacher candidates used technology in social studies lessons. Friedman and Hicks also describe how the field was evolving from small case studies advocating

for the potential integration of social studies, to more in-depth examinations of how these technologies are used, as well as how teachers can improve their instruction by integrating social studies. They highlight the role of teachers in scaffolding activities to promote inquiry learning and constructivism (e.g., Doolittle & Hicks, 2003) and commend examples of research highlighting the practice of teacher educators. For example, Crowe (2004) describes the value of modelling technology use in methods classes. At this point in time, Friedman and Hicks (2006) point out the scholarship was limited because it mostly discussed the potential of new technology to transform social studies education without offering much in the way of critique.

In a similar evaluation of the state of the research into technology and social studies education, Swan and Hofer (2008) describe how much of research in the field was qualitative in design. Rather than question the nature of the generalizability of this type of research, as Adler (2008) does, they cite Lincoln and Guba (1985) and claim qualitative research has a distinct advantage: “Thick description is an important characteristic of qualitative research, enabling ‘judgements of transferability’ by providing sufficient context for the reader to make comparisons to other settings” (Lincoln & Guba, 1985, p. 359). They contend qualitative research has value because “Detailed descriptions of setting, context, participants, and results strengthen the trustworthiness of qualitative findings” (Swan & Hofer, 2008, p. 321). However, they also note that often due to publication constraints, many studies omit to adequately describe the context, technological environments, and structure and implementation of interventions for there to be more theory about the impact of context on the learning. Furthermore, they critique the lack of follow up, particularly where student gains are mentioned. The reliance on self-reported data may lead to problems of trustworthiness. For example, there are the possibilities that students are telling the researcher what they think the researcher wants to hear. Likewise, the

research questions asked in these studies tend to advocate adoption rather than investigate the impact of new technologies in social studies. Swan and Hofer (2008) comment:

Researchers appear to assume that technology is preferable to traditional modes of instruction, that it can make a good teacher better, and that it leads to more student centered (and therefore preferable) instruction. While any of these assumptions may prove to be the case, we might be better served to investigate how a particular technology-enhanced activity supports particular kinds of learning. (p. 321)

Levstik and Tyson (2008) claim there has been such a rapid pace of technological change that educators find it hard to stay abreast of it. They add that researchers also struggle to conduct in-depth long-term research going beyond case study approaches advocating for inclusion. Indeed, the inability of researchers to stay on pace with technological innovations is often a critique of research in this area (Berson & Berson, 2014). Likewise, there is also criticism that studies on technology in the social studies “have failed to capture authentic practices in authentic settings” (p. 116).

In elementary education, the general trend in the research literature is few teachers make much use of technology as a social studies tool (Brophy & Alleman, 2008). VanFossen (2004) attributes this to a perception among teachers that their students are not developmentally ready to use technology tools, another example of how teacher beliefs impact practice. An additional area which is under-researched in this field is the digital divide between women and men, students of color and European American students, and affluent and non-affluent students. Gender, race, or class and its relation to technology and social studies instruction is an area that is not yet fully understood (Crocco, 2008). Crocco also claims these issues are not addressed adequately in methods courses, implying methods courses need to do more in this area.

As well as the ongoing critique of the research into social studies and technology integration, there are other areas which can benefit from further research. For example, Swan and Hofer (2008) call for more research in to how certain technology uses support different pedagogical approaches. They also call for research in to how teachers might navigate the use of different tools and resources in their own practice (e.g., Diacopoulos, 2015). More research is also needed into the social studies methods classes as spaces where teacher candidates use technological tools for content delivery (e.g., Lacinda, Mathews, & Nutt, 2011). Adler (2008) recommends social studies methods instructors should research preconceptions of teacher candidates' experiences with technology, their attitudes towards technology integration, its use, and acquisition of skills. Adler adds researchers should follow the same teacher candidates into schools to investigate the enactment phase, thereby providing more longitudinal evidence.

Hicks, Lee, Berson, Bolick, and Diem (2014) address the ever-changing landscape of technology and social studies education. They acknowledge the digital divide persists and there is a subsequent need for educators to offer different levels of support to overcome this. They challenge teachers and teacher educators to “model and use academic experiences to engage students with and solve civic problems.” (p. 443). They hope with technology and good teaching, students will view issues in global terms. Finally, they request future researchers pay attention to student learning and processing across the social studies disciplines with the use of technological tools. To achieve this aim, teachers should be prepared and ready to engage in innovative professional development that meets their immediate instructional needs. Therefore, teacher educators must look at ways new technologies can enhance students' abilities to produce information. Hicks et al. (2014) also stated research is no longer about “using the newest and shiniest technologies...it is the creative and mindful use of these technologies to support what we

know about how students learn that is paramount” (p. 446). Hofer and Swan (2014) build upon Hicks et al.’s call for more mindful use of technology by advocating for a research shift away from how technology is used to engage learners, and into the use of technology to enhance skills such as digital literacy.

Thus far, the research trend has been focused largely on case studies to examine how technologies engage learners, or assist in their acquisition of information, and less on how technologies enhance skills. None of these studies discuss potential problems in social studies preservice education with the learning of technology integration. In the next section I will discuss the extent that researchers investigate the learning of technology by social studies teacher candidates in their methods classes.

Technology in Social Studies Methods Classes

Berson and Berson (2014) argue that the “Successful implementation [of technology] necessitates the role of well-trained educators who are confident users *of* the technology” (p. 115, emphasis added). The importance of methods courses in achieving this aim has been understood for some time and is a key finding that arises out of this chapter so far. Emphasis upon the role of methods classes is evident in the CUFA guidelines on technology integration in the social studies (Mason et al., 2000). Leading to subsequent research conducted with the CUFA guidelines prominent. For example, Molebash (2002) conducted a case study of a social studies methods instructor as she incorporated new technologies into her coursework. Molebash argued that this case study provided an example of how constructivist theory and educational technology were not mutually exclusive concepts. As an advocate for technology integration, he hoped that by describing an example of successful technology integration, other likeminded teacher educators would look to use more technology in their methods classes too. Molebash’s study is a typical

example of the advocacy approach that researchers tended to adopt at the turn of the 21st century. Advocacy approaches are often criticized as they tend to describe cases of technology integration in a positive and uncritical light, without discussing the problems or alternative pedagogies that could have been implemented.

Other advocates of technology integration within methods instruction consider the use of TPACK to be a better approach than having a context neutral stand-alone technology class. This is because

...technology integration experiences integrated with authentic teaching and learning experiences in teacher preparation are recognized as more effective than stand-alone classes...as standalone classes tend to overemphasize pure technology skills as opposed to methods of integration of technology into teaching and using technology to support pedagogical goals. (Brush & Saye, 2009, p.46)

However, adoption of TPACK can be problematic. For example, teacher candidates do not have as much time to practice technology integration as teachers. Also, there is little evidence yet of a transfer of this theory into classroom practice. Consistent with research about Shulman's theory of PCK, teacher candidates need to have as much opportunity to gain authentic experience of technology integration. Likewise, social studies teacher educators should "provide multiple opportunities for students to acquire and practice skills that can be directly applied to their future classrooms" (Journell, 2009, p. 66) through modelling technology use and connecting to classroom practices (Rosaen & Terpstra, 2012). Moreover, if technology integration is weaved into methods classes, as in the example of Bates (2008) who incorporated Web Quests into instruction, then teacher candidates who experience technology as a "natural part of teacher

education courses will foster the kind of teaching necessary to create technologically rich and inquiry rich approaches to social studies instruction” (p. 19).

The potential to leverage communications and social media to develop TPACK in teacher candidates is a common theme throughout the research. Computer Mediated Communication (CMC), is often a part of the methods experience, delivered using discussion boards and blogs. Case studies of methods classes show teacher candidates have little trouble accessing and making meaningful contributions using this system. Researchers posit exposure to this type of learning should be enough to inspire teacher candidates to use it in their future teaching practice (Hilburn & Maguth, 2012; Mason & Berson, 2000). Similarly, examination of the use of discussion in controlled social media environments, like Ning™ and Edmodo™ benefit the reflection process. However, the authors of these studies express doubt over whether teacher candidates will continue to use these methods to share reflective practice, and as with most research in this area, they were unable to follow up to investigate whether their subjects implemented reflection in their own teaching (Krutka, Bergman, Flores, Mason, & Jack, 2014; Reich, Levinson, & Johnston, 2011).

Consistent with the research on teacher beliefs, Doppin (2007) also asserts teacher candidates must be challenged to reconcile their philosophical, pedagogical, and classroom management beliefs with the integration of technology. Likewise Waring and Franklin Torrez (2010) caution teacher educators to be mindful of the strategies they employ lest their preservice students should fall back on Lortie’s apprenticeship of observation. In this way, researchers of technology in social studies methods courses imply that social studies teacher educators are faced with finding the right balance between technology integration, reflexive practice, and balancing pedagogy with the teaching of content.

Finding a balance between technology, reflexive practices, and pedagogical practices involves having a more nuanced understanding of where teacher candidates are with their beliefs. In this regard, studies of teacher educator practices have some influence in the field. For example, Fransson and Holmberg's (2012) self-study of teacher education practice unpacked the work of methods instructors and how they integrate technology. They recommend methods instructors should seek support in developing ways to understand preservice teacher beliefs, especially where technology integration is concerned. This is particularly important as we already know from earlier in this chapter how new teachers "do not emulate the methods instructors in their teacher preparation programs, but instead the teachers they grew up with, the ones they routinely criticized as hopelessly out of date" (Percy, 2013, p. 368). So, teacher educators need to consider their teacher candidates' multiple perceived impediments to effective technology integration and must design their courses to address these issues.

Indeed, impediments to technology integration are uppermost in the minds of teacher candidates when investigating their preconceptions about technology integration (Bennett & Scholes, 2001; Bolick, Berson, Coutts, & Heinecke, 2003; Keiper, Harwood, & Larson, 2000; Mason & Berson, 2000). Together these studies called for greater exposure in methods classes to counteract the concerns of teacher candidates. Moreover, social studies methods instructors, when surveyed, are keen to provide students with technology skills, hoping exposure in methods classes might help assist teacher candidates in their implementation of technology in social studies (Bolick, Berson, Friedman, & Porfeli, 2007).

TPACK should play a key role in promoting understanding of how to merge teacher candidates' technological knowledge with how they intend to teach. Teacher educators cannot make assumptions about the inherent abilities of their teacher candidates (Byker, 2014). Instead,

time must be spent to teach technology in teacher education, particularly in methods classes rather than hope teacher candidates pick up TPACK on the way (Kerr, Schmeichel, & Janis, 2015).

Critical Research

As I mentioned earlier in this chapter, one of the critiques of the research on social studies and technology integration, whether it be research of teachers practices or research into teacher education practices, is that much of the research follows specific cases advocating for successful technology use. Commentators such as Swan and Hofer (2008) and Hicks et al. (2014) are critical about the lack of follow through by researchers when investigating the use of technology by their teacher candidates. For practical reasons, it is difficult to track teacher candidates into their classroom experiences. A rare example of a longitudinal study addressing this problem is the work by Wilson and Wright (2009) and Wright and Wilson (2010) who track two teacher candidates from their program through their first five years of teaching. Basing their work on a framework developed by Lee (2008), they assess how these teachers “viewed, negotiated, and enacted social studies and technology in their classrooms” (Wilson & Wright, 2010, p. 223). Their main findings were each teacher has different reasons and rationales for choosing, or not choosing to use a technology in their social studies instruction. Wright and Wilson’s work confirms Mishra and Koehler’s (2006) view that the application of TPACK is complex. Moreover, Wilson and Wright’s study is powerful when compared to most of other research in the field as it does not merely advocate for good uses of technology in social studies, but demonstrates that teachers need ongoing professional development if their TPACK is to keep pace with technological changes. Ultimately, the work of Wilson and Wright confirm teacher

educators must “support the deployment of technology in classrooms based on sound theoretical and pedagogical decision-making” (Wright & Wilson, 2009, p. 151).

Wilson and Wright’s work provides a rare example of a powerful long-term study which meets the recommendations of some of the critics of the research in this area (e.g., Hicks et al., 2014; Swan & Hofer, 2008). Wilson and Wright follow the participants from preservice to in-service teaching situations, they conduct research in authentic settings, and the reporting is more than an advocacy of technological tools and examples of good practice, but a critique of the ever-changing attitudes to technology use of the two teachers in this study. Similar longitudinal research, with more participants, would add greatly to the knowledge base in this area. Although growing, research is still often focused on case studies demonstrating good practice, with little critique of pedagogy, enactment, implementation, or long term follow up to measure possible changes of technology use in different contexts over time. Moreover, most of the research into preservice social studies teachers’ learning of teaching with technology often ignores, or pays lip-service to TPACK.

Wilson and Wright’s work is a good example of how the focus of research into technology and social studies is changing. The debate has now shifted away from whether technology is needed in social studies and how it might be useful, to what “technological tools work best and how to deploy them for the benefit of collaboration, critical thinking, and problem-solving skill development” (Berson & Berson, 2014, p. 116). Another way to look at the change is to recognize that if TPACK is to be used successfully in social studies teacher education, then the onus must be on developing pedagogical content knowledge first (Hammond & Manfra, 2009). Once this intention is resolved, then the technological tool is to be considered. However, as demonstrated in the framework for teacher learning (see Figure 2.1) in the first part

of this chapter, at the heart of content and subject knowledge is the pedagogical vision of the preservice teacher. The development of teacher candidates' epistemology is at the root of challenging preservice teacher preconceptions to implementing TPACK just as it is when implementing PCK (Salinas, Bellows, & Liaw, 2011). Therefore, it is possible to infer future research in this area needs to build upon that of Wilson and Wright. There is a need for further examination of the use of TPACK in developing preservice social studies teachers' use of technology, as well as addressing teacher candidates' beliefs and preconceptions in the social studies methods class. This study aims in part to fill that need.

Part Two Summary

In part two of this chapter, I highlighted the basic principles of teaching social studies from a constructivist paradigm, using examples from the literature to posit how this can be achieved using technology. Indeed, Martorella's (1997) call to "wake the sleeping giant" of social studies with technology advocated exactly that point. Consistent with the findings in part one, methods classes were claimed as the best places where learning to teach social studies with technology can best happen. However, like the first part of this review, I also identified research which addressed the problems of teacher belief in social studies. Problems of teacher belief reveal that at a common level, social studies teacher candidates are reflexively conservative (Slekar, 1998). From the research in this part of the literature review, I found that teacher candidates' preconceptions, beliefs, and dispositions can be best challenged by developing a social studies specific vision, or rationale, based on the work of Dinkelman (2009), and Hawley and Jordan (2014) by asking the question "what do you teach social studies for?"

I also analyzed studies investigating technology teaching in social studies teacher education. Most studies adopted a case study methodology using a stance of advocacy for certain

technology tools, or advocating for technology use and modelling in methods classes, which affords teacher candidates an opportunity to gain valuable experience to carry over into their practice. However, these assertions are mainly speculative as the studies themselves did not follow the teacher candidates' enactment, or even their intended enactment, into K-12 classrooms. Moreover, many of the studies on technology in social studies teacher education and methods classes were not overtly framed in TPACK even though the examples of good practice they advocated for aligned with it.

Exemplars of research in this field are hard to come by. But the ongoing work of Wilson and Wright provide evidence of how it can be achieved. Their longitudinal study assessed the TPACK of two preservice, and then in-service social studies teachers. While they used a small sample, their work was exactly the type of research called for by critics. Wilson and Wright describe how the ever-changing technological landscape had a direct impact on how their teachers implemented TPACK. The key finding of their work, consistent with the key findings in part one, is that TPACK needs to be included in methods instruction, referred to when teacher candidates enter their practicum, and should be the basis of ongoing professional development as these teachers enter the field. This has research implications which I will address in part three of this chapter.

In part three of this chapter, the burgeoning research on technology integration in social studies preservice education, and methods courses is described. This is followed by a conceptualization of this work into a theoretical framework describing the teaching of technology to preservice social studies teachers. Lastly, I suggest further research into technology in social studies methods courses with the intention that the study as outlined in Chapter Three, will fulfil some of these needed areas of research.

Part Three: Integration of Technology in Social Studies Preservice Education

It has been eighteen years since Martorella (1997) declared social studies was a “sleeping giant” who would awaken to a brave new world of technology use. The College and University Faculty Association of the National Council of Social Studies (CUFA) (2000) soon after published guidelines which spurred attempts by researchers to show just how this could be achieved in preservice education. Teacher educators adopted approaches aimed to model the use of technology (Crowe, 2004), or exposed their teacher candidates to technology tools for social studies with the aim of increasing the potential for teacher candidates to implement it themselves (e.g., Berson, 2000; Doolittle & Hicks, 2003; Mason et. al., 2000; Molebash, 2002).

Unfortunately, Cuban’s (2001) concern that teachers would continue to replicate their old practice with new tools was well founded. Researchers soon changed their emphasis from the adoption of technology toward investigating how technology should be used to improve social studies pedagogy (e.g., DeWitt, 2006; Friedman & Hicks, 2006).

The change in emphasis from technology adoption to technology infusion to enhance pedagogy also highlighted the role methods courses must play in the adoption of technology in the social studies. Increasingly, TPACK (Technological, Pedagogical, and Content Knowledge) became the go-to framework for teacher educators to measure their attempts at integrating technology into the social studies (e.g., Brush & Saye, 2009; Hammond & Manfra, 2009). Furthermore, researchers of TPACK call for not just integration of technology into social studies methods courses, but an emphasis on how technology can be used to enhance social studies pedagogy. For example, they asked how inquiry learning might be enhanced using online resources (Waring & Franklin Torrez, 2010), or how might digital discussions on social media platforms be used to facilitate student understanding of multiple perspectives (Krutka, Bergman,

Flores, Mason, & Jack, 2014)? In both examples, researchers task social studies teacher educators to carefully examine how their use of technology might assist pre-service teachers in delivering good social studies pedagogy.

An emphasis toward TPACK is also reflected in the National Council for Social Studies guidelines for technology integration (NCSS, 2013). The NCSS guidelines begin with the assumption that teachers will be using technology in pedagogy. The NCSS express a desire to see technology used to teach powerful social studies instruction. In their current form the guidelines are an evolution of previous iterations which emphasized technology use to enhance pedagogical practice. In the newest version (NCSS, 2013), technology use in the social studies classroom is assumed. The NCSS guidelines further focus on how integration will occur as part of social studies pedagogical practice, thereby aligning well with the principles of TPACK.

Although TPACK has weaknesses, it is widely accepted as a model for preparing teachers to include technology in their instruction. It would be logical to assume that with acceptance comes use, and ultimately an evolution of pedagogical practice by social studies educators. Unfortunately, as Percy (2013) points out, social studies methods classes and teacher preparation programs in general are still not achieving the potential highlighted over 18 years ago by Martorella (1997). Often distracted by the speed at which technology tools have evolved, methods classes and class instructors have not managed to keep up.

As well as navigating the complexities of an evolving technological landscape, addressing TPACK, and aiming to produce good teachers, social studies teacher educators must also address preservice teacher belief. In this chapter I have described how teacher educators must overcome the effect that beliefs and preconceptions have on teacher candidates' capacity to implement technological innovation in the social studies. The research on teacher beliefs

described so far illustrate how teacher candidates often fall back on Lortie's (2002) "apprenticeship of observation" and tend to a state of "reflexive conservatism" (Slekar, 1998). teacher candidates' beliefs and preconceptions about teaching are hard to shift, and the examples already described imply beliefs are even more rigid when considering social studies and technology integration. From the research examined in this chapter it can be inferred that methods classes are the space in which teacher educators might challenge teacher candidates' beliefs. Yet there are few solid examples of how technology integration in methods classes can be achieved. Therefore, it is unclear if methods classes are best for addressing beliefs about technology integration. However, when methods classes do address preconceptions, they are often reported as effective (e.g., Hawley et. al., 2012; James, 2008, 2010; Pryor, 2006; Slekar, 1998).

In studies which investigated preservice teacher resistance to technology integration, a common recommendation is that social studies methods instructors need to be mindful of their preservice teacher's pre-existing beliefs and experiences with technology integration as they design instruction (Crowe et. al., 2006; Doppen, 2007; Salinas et. al., 2011). These researchers generally agree teacher candidates' resistance needs to be addressed and adapted, rather than overcome if we are to see meaningful integration in methods classes because the most recent reports state that we are still far from achieving Martorella's vision (Hicks & van Hover, 2014).

A constant theme throughout the research is a call for social studies methods classes to be spaces in which good practice is modeled. Methods classes are the space where teacher candidates will be exposed to the underlying values and principles of social studies education, and it is in these methods experiences where teacher candidates may be exposed, some for the first time, to meaningful technology integration. Methods instructors must take care to unpack

their practice and be overt about their use of the TPACK framework as they facilitate the development of teacher candidates (Hofer & Swan, 2014). Social studies researchers claim standalone technology classes do not provide opportunities to make pedagogical decisions about technology use. They are too broad and focus on the tools rather than the teaching (Hofer & Swan, 2014). It is therefore inherent upon social studies methods instructors to include as much pedagogically charged technology integration as possible. As a framework, TPACK can be useful for instructors and teacher candidates to consider their implementation of technology infused social studies. However, as much as the TPACK framework as a tool assists the development of teacher candidates as curricular decision-makers, it cannot overcome the preconceptions and beliefs teacher candidates have about technology integration alone.

Future Directions

Earlier in this chapter I discussed research which consistently supports the notion that it is almost impossible for methods classes to overcome teacher candidates' resistance to teaching ideas that are contrary to their beliefs (e.g., James, 2008; 2010; Slekar, 1998). This is also true when it comes to technology integration in the social studies (Crowe et. al., 2012). However, Darling-Hammonds' frameworks for teacher education, advocating a development of a vision for teaching at the center, provide an outline for social studies methods instructors to borrow from. By preparing teacher candidates to have a pedagogical vision, or rationale, teacher educators can go some way to challenging preservice resistance.

In this chapter I described how social studies methods classes which adopt a rationale based approach to instruction, placing the teacher candidates' beliefs as the focus, can lessen resistance to change (e.g., Hammerness et al., 2005; James, 2008, 2010). I also described how, by encouraging reflection the theory to practice gap can be bridged (e.g., LaBoskey, 1997;

Zeichner, 1983). Therefore, it is possible future social studies methods classes might look to adopt a rationale based approach along with the TPACK framework at its core (see Figure 2.5 below).

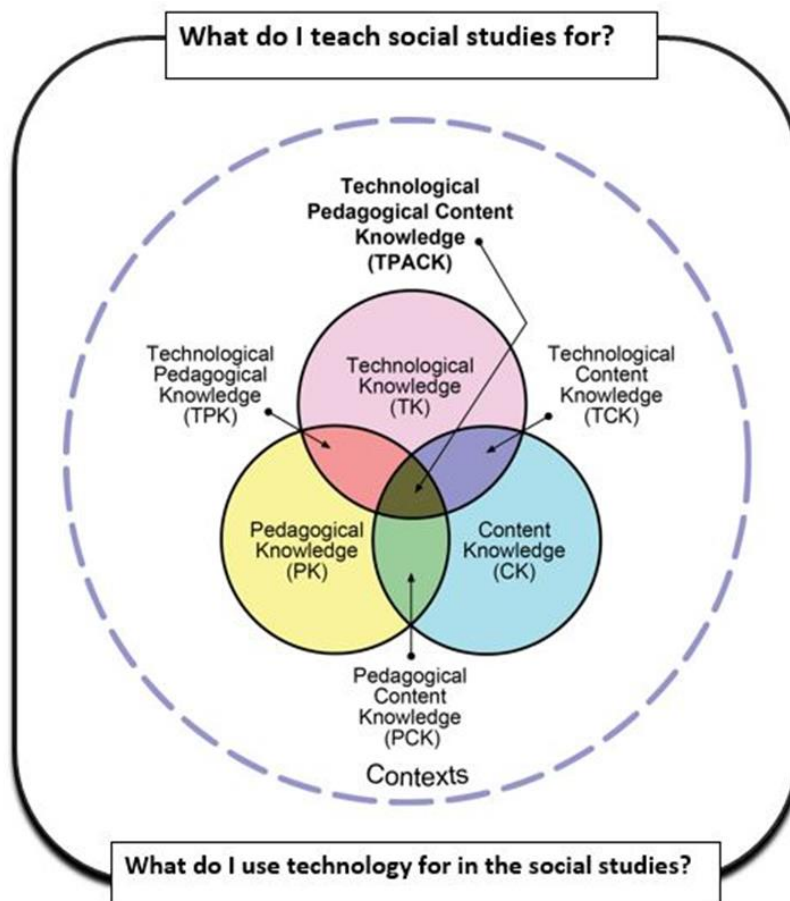


Figure 2.5. A suggested framework for developing a vision for teaching technology through social studies methods classes.

Dinkelman (2009) suggests teacher educators can help teacher candidates to develop a pedagogical rationale by asking the question, “What do you teach for?” This question can be adapted to “What do you teach social studies for?” to develop a content specific rationale for social studies instruction (Hawley & Jordan, 2014). To further the development of rationale in teacher candidates, methods instructors should also ask, “What do you use technology for in the

social studies?” This may prove to be a powerful way to generate discussion about technology integration focused around pedagogical uses of technology in the content. Furthermore, attention must be paid in the methods experience to teacher candidates’ abilities to reflect upon, unpack, and justify their pedagogical decisions, with technology integration as a focus. This should go some way to not only addressing preservice teacher beliefs and preconceptions, but also placing these beliefs within a context of sound pedagogical practice fused with good content knowledge. Thus, these two rationale-based questions envelope the TPACK framework which sits at the heart of instruction.

In addition to a recommended framework, grounded in the research described in parts one and two, there is also a need for more longitudinal and long term studies of teacher enactment of technology in social studies, more use of TPACK as a measurement of technology integration proficiency, research to investigate the use of reflection as a way of addressing preservice teacher belief and preconceptions, and research to investigate the efficacy of methods instruction, as well as that of standalone technology classes at developing TPACK in preservice social studies teachers. Studies that attempt to merge the development of enactment of TPACK in teacher candidates’ lesson planning, therefore bridging the theory and practice gap are also warranted. It would be helpful to evaluate approaches of different instructors and their rationales and visions for social studies methods instruction against this framework. The results may have interesting implications for the professional development of methods instructors, as well as possible implications for the social studies methods curricula.

From this I suggest a developed framework (see Figure 2.5) which attempts to consider beliefs and preconceptions of teacher candidates, while also accounting for technology integration throughout the preservice social studies experience. Subsequently, it is my

speculation that the greater the quantity of rationale, reflection, and TPACK, the more likelihood of teacher candidates showing powerful and authentic, technology rich, social studies pedagogy when they are in the classroom.

Chapter Summary

In this chapter I explained the research investigating the learning of teacher candidates, the necessity to develop a rationale, or vision for preservice education, and a variety of frameworks to explain how this might be achieved. The development of TPACK as a model to combine Shulman's PCK with the growing importance of technology integration was also discussed, as was research providing context for the use of TPACK as a framework for preservice teacher education. In the final part of this chapter I outlined the burgeoning research on technology integration in social studies preservice teacher education and the use of TPACK in that field of research. I outlined future research areas along with a suggested model for blending a rationale for teaching social studies with a rationale for infusion of technology around the learning of TPACK in social studies. From the research discussed thus far, the implication is that social studies methods classes may be the best spaces for preservice social studies teachers to gain exposure to both TPACK and rationale development. However, I have also accounted for research demonstrating how methods classes are complex and do not consistently address technology integration. On the other hand, I described how standalone technology classes provide an introduction for social studies teachers to technology tools, but do not necessarily address pedagogy. Therefore, the main purpose of this study is to investigate the learning spaces of preservice social studies teachers and see how TPACK and rationales are addressed to overcome issues of preservice teacher belief and dispositions toward both technology integration and powerful social studies pedagogy. In the next chapter I will outline how this study will

investigate the development of rationale, TPACK, and the power of preservice social studies teachers' belief, in the context of an educational technology class as such a learning space. I will also explain how a case study was conducted to assess what factors within the class might influence preservice social studies teachers' learning of, disposition to, and possible future enactment of social studies technological, pedagogical, content knowledge (TPACK).

Subsequent chapters will describe the findings of this study and points of discussion arising from the findings considering this literature review.

CHAPTER 3

Methodology

In Chapter One, I highlighted some problems that make teacher education complex (Tom, 1997), and the ways in which these issues manifest in how social studies teacher candidates best learn to purposefully integrate technology. I outlined the benefits of both social studies methods and educational technology classes, as spaces where social studies teacher candidates can develop their understanding and enactment of technological, pedagogical, and content knowledge (TPACK).

In Chapter Two, I examined research that addressed how teacher education programs could best overcome problems of preservice teacher learning. I showed how well-constructed teacher education programs, including those that address issues of vision and rationale, have the potential to overcome what Slekar (1999) describes as a state of reflexive conservatism where teacher candidates choose a default mindset of traditional, teacher-centered instruction rather than take perceived risks in constructivist teaching. teacher candidates' perceptions of risk are shaped by their experience as K-12 students. Lortie (2002) described this as the "apprenticeship of observation" where teacher candidates' K-16 experiences form their beliefs and preconception about what constitutes good pedagogy.

Darling-Hammond and Bransford (1995) argued that by addressing teacher candidates' vision of pedagogical practice, teacher educators might go some way to addressing some of these problematic preservice teacher beliefs. Similarly, in Chapter Two I described how Dinkelman's (2009) call to place rationale at the center of preservice teacher education was also aimed at solving this problem of perceived practice. This call was enacted by Hawley and Jordan (2014) within the social studies content by asking the question "What do you teach social studies for?" In doing so, they placed the development of content specific rationale at the center of methods

instruction. They hoped that social studies teacher educators might overcome teacher candidates' beliefs and possible misconceptions resulting from their pre-existing epistemological stance. They claim this line of thinking encourages teacher educators to place less conservative social studies pedagogy at the heart of their instruction.

The previous chapters also discussed models that illustrated forms of good instruction. Shulman's (1987) Pedagogical Content Knowledge model (PCK) provided an opportunity for teachers and teacher educators to discuss content specific pedagogical practice. PCK illustrated how good teachers should blend their ability to know content, and how to appropriately facilitate learning of content by their students. However, with an increasing ubiquity of technology in classrooms, and the expectation that teachers will include technology in their instruction, Koehler and Mishra's (2009) Technological, Pedagogical and Content Knowledge model (TPACK) prompted further discussion as it built upon Shulman's PCK model. The TPACK model places the knowledge and pedagogical uses of instructional technology in content specific settings and as such can be used by researchers, teacher educators, and teachers as a tool to assess their development.

In Chapter Two I also highlighted several recommendations that emanate from the research on technology in social studies teacher education. For example, social studies researchers in general position the methods class as a vital space where content specific pedagogy can be learned within a rationale-based context. The consensus of researchers aimed to develop social studies teachers who are prepared to teach diverse learners prepared for today's high stakes environment in technology rich schools. However, in Chapter Two I also identified the unfulfilled role played by educational technology classes in meeting these aims. This study, therefore, is focused on the extent that a standalone educational technology class could address

the needs of social studies preservice educators. I investigated the development of technological, pedagogical, and content knowledge of the participants as well as their burgeoning rationales as prospective social studies teachers. I intended to see if aspects of the course, structure, coursework, delivery, influenced the participants' epistemological stances. Ultimately, this study framed itself around the extent that the course influenced secondary social studies teacher candidates, and encouraged them to reconsider their preconceptions and beliefs about social studies pedagogy in general and technology integration within the social studies content.

Research Design

Concepts such as belief, disposition, and rationale are difficult to quantify. Similarly, where a teacher might be placed on a framework such as TPACK is subjective. As a result, I chose to use a qualitative approach to this study. By collecting data in real-world settings under common, every day conditions I chose a naturalistic qualitative methodology. Naturalistic qualitative research is described by Patton (2002) as “naturally unfolding...it has no predetermined course established by the researcher” (p. 39). For this study, the naturalistic qualitative tradition of case study was used to determine if an educational technology class went any way to challenge the problem of preservice teacher belief while also increasing teacher candidates' general understanding of technological, pedagogical, and content knowledge (TPACK).

In the previous chapter, critiques of research on preservice teacher learning of technology is that it consists mainly of case study and is focused on one tool or application through a supportive lens. When researchers are unwilling or unable to examine their case in context of a bigger picture, or in relation to the many complex factors at play, they leave their research open to criticism. For example, Hofer and Swan (2014) describe the need for research to take less of

an advocacy approach, while Byker (2014) asks researchers to not assume a level of digital competence in the part of teachers. Kerr, Schmeichel, and Janis (2015) also want to see TPACK used as a tool for teaching TPACK, while Powell (2017) looks to researchers to examine the interplay between content and pedagogy. With these critiques in mind, I constructed a case study with a starting aim of finding out where the participants were with their understanding of TPACK, evaluating the way TPACK was used to influence participants' learning, beliefs, and possible disposition toward enactment of technology infused instruction, and pay attention to the interplay between not only content and pedagogical knowledge, but also how technological knowledge reacts with them.

Case Study

Yin (2014) provided a two-part definition of case study as a research method. He defined the scope of case study as an empirical inquiry which:

1. ...investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not clearly be evident.
2. ...copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis. (pp. 16-17)

Using Yin's (2014) broad definition, it is possible to describe case study as an all-encompassing method. Case study covers the logic behind design, data collection, and approaches to data analysis. For Yin it is a research method that involves more than data collection alone, and

certainly is more than a research design. He asserted that case study is either epistemologically relativist or realist, depending on the circumstances of the case. For example, if the study is designed to investigate a finite reality existing independently from the observer, then it is epistemologically realist. However, if the study examines multiple realities, perspectives, and meanings, or a theoretical framework that may be evolving, or even findings that are observer dependent, then the case study is from a relativist epistemological orientation.

Research is always based on theory, however, when theory is underpinned by an implicit or explicit epistemological position (Van de Ven, 2007), this theoretical stance typically assumes a realist world view (Braun & Clarke, 2006). Moreover, research rooted strictly to a hypothesis or testing a theoretical framework can be classed as realist. Often there are some common criteria from which to measure the findings across all the data (Braun & Clarke, 2006; Hammersley, 2007; Reicher, 2000). However, for qualitative case studies, common criteria might limit the scope of the findings (Hammersley, 2007).

Conversely, research that allows for theory building or meaning to derive from the subjective interpretation of data, for example grounded theory, require the researcher to adopt an interpretive, rather than procedural way of working (Levitt 2015). Outcomes are therefore dependent on how I, as the researcher, interpret the multiple data points in the case to create multiple meanings. How these interpretations align with the research, the multiple data points, and the research question are crucial in this relativist study.

A History of Case Study

Stenhouse (1978) was an early proponent of case study research. He suggested case study as a means for capturing complexity and as a method distinct from ethnography. In case study the researcher is often intimately familiar with the educational setting or the participants so the

construction of meaning was not always attributable to an external, theoretical basis; whereas an ethnographer would attempt to remain impartial and ground understanding in existing theory.

Yin (2014) further divided case study into three types: exploratory, descriptive, and explanatory. The exploratory form involves the collection of data with a view to finding common patterns. Descriptive case studies consider possible theories and frame the inquiry with a research question, while explanatory case studies set out to explain the how or why of the issues, person, or group being investigated. Like Yin, Merriam (2009) attributed three typologies to case study: particularistic, descriptive, and heuristic. Particularistic case studies focus on a situation, event, content, or phenomenon. They aim to answer a specific question. Descriptive case studies have a focus on the “thick” description of the subject being examined (p. 43). These studies may look at how many variables affect each other in a context. Heuristic case studies look to develop a deeper understanding of the case. They look to find new meanings, or confirm existing theories. Merriam asserts that case studies can have many variables as possible and portray their interactions over time. They are more concrete, more contextual, more developed by reader interpretation, and based on more referenced populations determined by the reader. She notes that, “The more cases in a case study, and the greater the variation across the cases, the more compelling the interpretation is likely to be” (p. 49).

Stake (1995) defined case study around the researcher’s choice of an object of study. Stake’s emphasis was on the use of qualitative methods to gain unique insight into phenomena. Similarly, Pollard (2011), advocated for longitudinal studies to examine stakeholders in education. In his work he employed a variety of data collection methods (interviews, field notes, work samples, observations, video recordings, and drawings) over a three-year cycle, attempting to better understand the complexities of schools and learning. Her longitudinal ethnographic case

studies also contained examples of researcher reflection and practitioner research that were an evident feature of other research methods, like action research and self-study.

In educational contexts, case study has a broad definition and is widely used. It is employed to investigate phenomena, people, groups, theories, and practice. While it stands alone as a methodology, as with many qualitative traditions, it can be combined with other practices. As a methodology which answers the questions of how and why, it is well suited to educational research (Yin, 2014).

Uses of Case Study in Preservice Teacher Learning

The use of cases to inform educational practice is evident in some form or another since the early twentieth century. The emphasis for using case research to examine the learning of preservice teacher learning arose out of the reform movement of the late 1980s and early 1990s. The political pressure for reform prompted teaching colleges and professional associations to look closely at their own practices (Merseth, 1996).

The drive to examine practice served several purposes: One is that cases have been used as exemplars of practice. Cases become examples, emphasizing the theoretical, the prescriptive, or the model under investigation. Case study can serve to exemplify, "...the desired principle, theory, or instructional technique" (Sykes & Bird, 1992, p. 480). Broudy (1990) suggested that exemplar cases providing generic examples of practice can be understood by all teachers. So, using cases as exemplars highlights best practices and offers a "legitimate window on practice" (Hutchings, 1993, p. 11).

Case study also provides opportunities to put theory into practice. Cases that do not exemplify theory, but from which theory emerge are valuable for student teachers who can be presented with opportunities to untangle the intricacies of practice which are "complex and

undefined and impose a coherence of their own making” (Barnes, 1989, p. 17). Thus, cases can provide teacher candidates with opportunities to problem-solve and decision-make through the analysis of case study research (Merseth, 1991).

Similarly, case study can be used to stimulate reflection with a view for action. Stemming from the work of Schön (1991) and Zeichner (1986), case studies are often used to identify tacit elements and make them more explicit (Richert, 1991). Through reflective writing, case studies morphed into distinct research areas such as self-study and action research. Self-study concentrates on the work of teacher education, while action research examines the practices of teachers in the school context.

With the desire to investigate practice with a view to promote change, case study has been instrumental in understanding the thoughts and belief of preservice and in-service teachers. Over the last 30 years, case study research published has addressed issues such as diversity and multicultural perspectives, motivation, management, the theory and practice gap, and the development of pedagogical content knowledge. Likewise, case study was used to outline the use of problem-solving and decision-making skills, the influence of educational settings and multiple perspectives, the development of personal efficacy, as well as the use of reflection in educational settings (Merseth, 1996; Yin, 2014).

The Use of Case Study in this Investigation

In this study, I investigate a contemporary phenomenon in depth within its real-world context. The phenomena and context boundaries are not clear. It is situated in a context where there are more variables at play than simple data points, therefore multiple sources of evidence are needed. The study is also framed around the concept of existing theoretical propositions to guide analysis. So according to Yin (2014), case study is the most suitable empirical inquiry to

pursue. For this study, the subject phenomena were an educational technology class's influence on social studies teacher candidates' preconceptions, beliefs, and dispositions pertaining to their understanding of TPACK. The bounded context of the educational technology class was part of a larger context wherein the participants learned about their future roles and identities as teachers. There were many variables at play making it necessary for me to use multiple points of data to gain understanding. In this case study, the teacher candidates completed two surveys (before, and toward completion of the course) which broadly described their developing levels of TPACK. In these surveys they also described their previous experiences of social studies education, as well as their experiences of technology infused instruction. They created lesson plans as part of their class participation, indicating their intended pedagogical enactment, reflecting their dispositions to enact their beliefs. Participants were subject to three semi-structured interviews focused on specific topics (interviews were conducted at the beginning, in the middle, and after the course and ranged from 45 to 90 minutes in length). Class assignments were also used to provide insight in to the participants' development and potential enactment of TPACK. As researcher, I attended lessons and made observations of the researchers and instructors actions, and kept a reflective journal of my thoughts after every class. These helped me frame and interpret the data, and adapt interview protocols as necessary to facilitate the inquiry.

From the literature review in Chapter Two an ideal theoretical framework was developed from the research literature (Figure 3.1 below). This framework posited that preservice education courses which address preservice teacher rationale, discuss context specific pedagogy, and model technology infusion, would increase levels of understanding of TPACK in its participants, and therefore increase the likelihood of future enactment by the class participants. This study

investigated the extent that an educational technology class supported this framework.

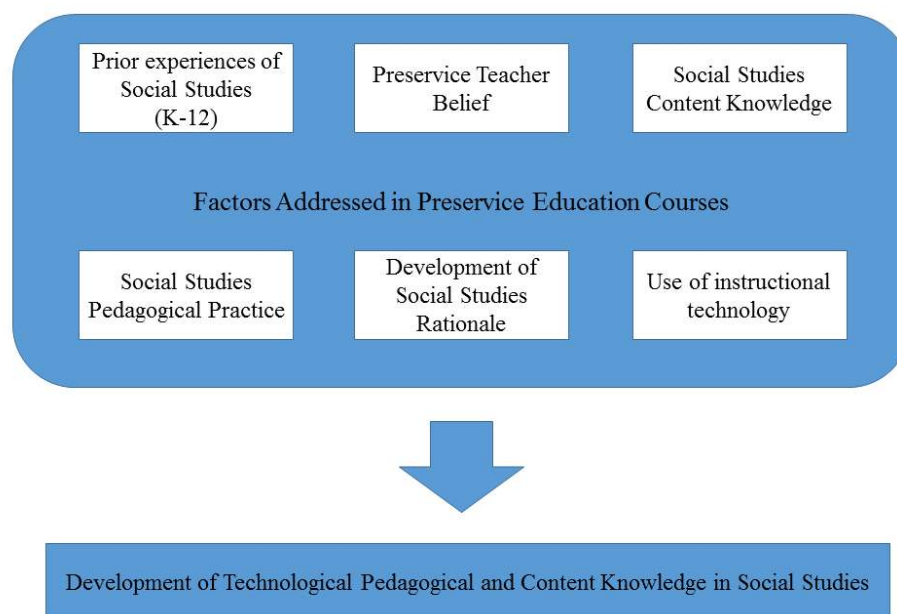


Figure 3.1 Theoretical Framework for this Case Study

For this study, I followed Yin's (2014) recommendation of investigating each individual factor of the case, then using those factors to extrapolate possible emerging theories about the class in general. I investigated all the factors that occurred within the case, which allowed for the deep analysis of the educational technology class. As a result, the selection of case study as an appropriate method for this afforded for the opportunity to focus on questions of "how" or "why" in a contextual setting. Primarily, I investigated how the educational technology class assisted preservice social studies teachers in making decisions about their future implementation of TPACK.

I also framed this study around a theoretical framework that posits teacher education classes must address multiple factors that include teacher candidates' prior experiences with social studies, their beliefs, their development of social studies content knowledge, their

development of social studies pedagogy, the implementation of a social studies rationale, and the infusion of educational technology. The outcome of the study demonstrated the extent that preservice social studies teachers may have altered their understanding of how to implement various parts of the TPACK framework, with evidence of intention to enact it, and how much their experiences in the educational technology class influenced their developing understanding.

Research Question

As explained in Chapter One, this case study addressed the following research question:

How does participation in an educational technology class help address issues of teacher candidates' prior beliefs, preconceptions, and dispositions toward technological, pedagogical, and content knowledge (TPACK)?

The Case

As I described in Chapter Two teacher candidates come to their education classes with a variety of preconceptions, beliefs, and dispositions. According to Cochran-Smith, Feiman-Nemser, McIntyre, and Demers (2008), teacher educators can address issues of teacher belief if they better understand the backgrounds and dispositions of their students. Cochran-Smith et al. (2008) also suggested that research that engaged in the process of acknowledging the voice of teacher educators, as well as the factors they consider important in their decision-making, is valuable for other teacher educators to learn from. Therefore, not only should teacher educators address teacher belief by improving their understanding of teacher candidates, but also by improving their understanding of their own decision-making. This is important for this case study. As explained in Chapter Two, the burden is on teacher educators to expose teacher candidates to the concepts and pedagogical methods they need to become effective practitioners.

Moreover, as I inferred from the research in Chapter Two, there is debate as to where technology is best taught. Social studies methods researchers argue that the strong disciplinary focus on PCK (e.g., Powell, 2017) makes this a strong area to address issues of epistemology and belief (e.g., Slekar, 1998). Social studies researchers who write from an advocacy stance, such as Hammond and Manfra (2009), posit that the methods course is where technological knowledge should also be infused. Their argument is that technology classes do not necessarily address TPACK, paying minimal attention to content and pedagogical knowledge, given the interdisciplinary nature of these classes. This is complicated to resolve because rarely are instructors in educational technology classes seen as disciplinary content experts, and it can be argued that few social studies instructors are technology experts. Therefore, TPACK is not fully addressed in either situation. Furthermore, by examining issues of preconceptions, belief, and disposition in teacher candidates, it is hoped that a broader understanding of preservice teacher learning might also add to the discussion. It is my goal that this case study, with a focus on the influence of the educational technology class on students' preconceptions, beliefs, and dispositions as they understand TPACK, can help teacher educators and program administrators better understand this divide. As a result, the findings and discussions arising from this study should be considered in future decisions about where PCK and TPACK should be addressed within preservice teacher education programs.

The Researcher (Reflexivity)

The role of the researcher is important in qualitative research because their “personal experiences and insights are an important part of the inquiry and critical to understanding” (Patton, 2002, p. 40). In entering the field, collecting data, interpreting the data, and sharing the findings, I attempted to capture the voices and understand the motivation of the participants as a

group and as individuals (Yin, 2014). Therefore, it is important to understand my role in this study. At the time of the study, I was a 43-year-old Caucasian male, serving as a doctoral student in a Curriculum and Instruction program at a large, four- year research intensive university. I am also a certified secondary social studies teacher with over twenty years' experience in middle and high schools as a social studies teacher and technology support specialist. Moreover, while in the data analysis phase, I worked as a district-level instructional support specialist, with an interest in how secondary social studies teachers learned about, and implemented, educational technology in their pedagogy. It should be noted that I was not the instructor of record for this class and was therefore not an active participant in the delivery of the educational technology class. However, I do have experience as an instructor of the previous iteration of the educational technology class, as well as experience as a social studies methods instructor. So, it is through this lens that I attempted to connect the past experiences of the participants to their present experiences of the class, and their potential future pedagogical practices, to shape the findings.

Although my role is not as a participant researcher, it is important to acknowledge how my experiences and positionality influences inferences drawn when interpreting the data (Avenier & Thomas, 2015). As the data was interpreted through my lens, it is also important to be reflexive (Baskerada, 2014). This can be achieved by corroborating interviews and observations with other the data sources, for example surveys, participant created artefacts, and class materials such as lesson plans (Yin, 2014).

Site Selection

I first sought permission and support from the instructor of record for the educational technology class under investigation prior to applying for IRB approval. Selection of this site was convenient, it addressed issues of TPACK, contained teacher candidates of whom some

would be social studies, and the instructor was willing to support my investigation of the class as a space in which student learn to use TPACK. Moreover, it offered a unique opportunity to understand teacher candidates' learning in an institutional context with which I was familiar (Conklin, 2010). This class was a new iteration of the educational technology course I had previously taught. The class I chose was to be the first time it was to be taught. As such, this afforded me an enhanced examination of how the class might influence preservice social studies teachers. The class itself consisted of a variety of teacher candidates with differing content specialties and levels for which they were gaining accreditation. There were future elementary, middle, and secondary educators in the class, with a mix of math, English, science, and social studies content specialties.

Before entering the field, I sought formal permission to ensure adherence to ethical research standards. Because this research was with human subjects, but within the context of a regularly administered course (apart from the semi-structured interviews), IRB exempt status was necessary. Therefore, an application for IRB exempt status was submitted to the College of Education human subjects research committee and permission was received prior to entering the field and conducting any observations. Once permission was formally attained, I began to identify my sample population for the case study.

Sampling Procedures

It was my intention to use the opening class meeting, to purposefully select participants for my study. They needed to be students who intended to gain licensure as secondary social studies teachers. So, in the opening meeting, I was introduced by the class instructor and the research project was explained to the class. Members of the class were taking their first or second education course and were still inexperienced, some not yet knowing which pathway or

what they were intending to teach. Prior to the class, along with the instructor, we examined the academic record of the students and identified members of the class who were potential future secondary social studies teachers. These were eligible to participate in the study. However, they had to do so voluntarily. Once I explained the research project to the class, and informed them of who was eligible, volunteers were sought. Those that did not match our initial criterion pool, or were not secondary social studies focused, were excluded from participation.

Once voluntary participants were identified, they were asked to complete the initial survey. From the initial surveys, demographic information (e.g., gender, ethnicity, program experiences) were used to define the sample population and provide basic biographical data. From this cohort, some students declared they were undecided about their content, or who were still considering elementary education, and were excluded. This left a population of five students as study participants who I initially interviewed. Five participants are a small but focused population but is suitable for a case study, and provided enough detail to develop understanding of the case (Creswell, 2012).

Although I was initially concerned about the small participant population, according to Yin (2014), more participants in a population does not necessarily correlate to better representation of the case: “It is misleading to think that the case comes from some larger universe or population-like cases, undesirably reigniting the specter of statistical generalizations” (p. 44). Yin argues that the case under investigation is what should be investigated and using a sample can be misleading. Stake (2005) also commented that “The purpose of a case report is not to represent the world but to represent the case” (p. 460). In this case study, the eligibility criteria of being a secondary social studies preservice teacher participating in an educational technology class, produced the maximum number of participants possible found in an authentic setting. The

findings will be reflective of the multiple variables at play in this context, and further emphasized the importance of my role as researcher in how I interpret those findings (Levitt, 2015).

Data Sources

According to Merriam (1998), “data collection in a case study is a recursive, interactive process in which engaging in one strategy incorporates or may lead to subsequent sources of data” (p. 134). There is not a proscriptive method of data collection for case study (Merriam, 1998), and as such the unique context of the educational technology class under investigation necessitated undertaking an adaptive approach which relies on the utilization of a variety of data sources in combination.

One of the benefits of using a qualitative approach affords for the personal experiences of the participants, along with the contextual settings in which a phenomenon to occur, to converge (Patton, 2002). In this study, convergence, or triangulation of findings, occurred from multiple data sources (i.e. interviews, surveys, lesson plans, observations, and other class documents) was used to increase confirmation and credibility (Yin, 2014). As primary researcher I fulfilled multiple roles: interviewer, observer, and data analyst. Each role was complimentary and provided for the opportunity to derive thick description of the pre-existing beliefs, preconceptions, and dispositions of preservice secondary social studies teachers toward technological, pedagogical, and content knowledge (TPACK) in the social studies.

Prior to the study, a cover letter, informed consent, and demographic sheet was sent to each participant in advance, clearly outlining the intentions of the study. Additionally, the informed consent clearly disclosed protocols and procedures for security of data, anonymity, and opt-out procedures. There were no monetary gains, or otherwise offered for participation in the

study, although the experience may have helped in the professional development of the participants as they were afforded opportunities to reflect upon their practice that they would not have received had they opted out of the study.

I entered the field to initiate data collection in January 2016 and completed data collection in May 2016. Collected data was secured in a private office in a locked cabinet. Electronic data was accessed on a password protected computer, and stored on a password protected dedicated external hard drive. This drive was secured in a private office in a locked cabinet. Data containing personal information was either masked or destroyed immediately upon possession to ensure anonymity. Audio recordings were professionally transcribed verbatim and destroyed upon transcription.

Table 3.1 below shows how the data collection for the study unfolded through each week. I attended every class and kept handwritten observation notes in a journal. These I transcribed within 24 hours. Interviews began during week two. Immediately after each interview I would transcribe my notes and write a brief reflection of my thoughts about the interview. This helped me shape future lines of inquiry while I waited for full transcriptions. Survey 2 was administered in week 8, halfway through the semester, and I made immediate notes and reflections on the results before conducting the second round of interviews in week 9. Interview 3 was administered in the final week of the class, as with other interviews, my notes were transcribed and I wrote immediate reflections on each within 24 hours. Finally, the instructor interview was conducted after the conclusion of the course. Consistent with the other interviews, I immediately transcribed notes and wrote a reflection while waiting for a full transcription.

Survey instrument. So that I might gain insight into the experiences of preservice social studies teachers with aspects of TPACK in their education thus far, I adapted a TPACK survey

instrument (Schmidt et al., 2009-10) as evident in Appendix B. This instrument had already seen use in a variety of studies and has a reported overall internal consistency of .89. The survey can measure technological, pedagogical, and content specific levels of knowledge, as self-reported by the participants. It was administered at the beginning, and after the middle, of the course. The survey was administered on-line and data kept in a secure, password protected site.

This survey has previously been used as a quantitative measure of educator's self-reported TPACK in multiple studies. For example, a recent study by Harvey and Caro (2017) used it as a pre-and- post measure to see if teacher candidates' self-reported levels of TPACK matched their implementation of educational design evidenced by their lesson plans. Likewise, Burden and Kearney (2017) used the survey along with open ended qualitative responses to learn about teacher educators' mobile learning practices. This is a rare example of a study into TPACK which uses qualitative data analysis of any sort. Koehler and Mishra (2009) did not claim that TPACK should be used as a framework for measuring teacher competency with technology integration; however, this is how TPACK is sometimes interpreted.

Wanting to remain within the spirit of Koehler and Mishra (2009), my use of the survey was different. Rather than follow conventional uses of the survey to measure self-reported TPACK changes over time, I decided that using the survey as a quantitative measure would not produce valid results. This case study has multiple data points which may prove more meaningful to the findings. So instead, my intention was to use the survey instrument to act as an illustration of perceived changes in TPACK by the participants, thereby providing informative discussion points for us in our interviews. As the researcher and interviewer, it was my aim to use the raw data from these surveys to prompt reflection in the participants, and to reveal insights into their potential implementation of TPACK in social studies.

Table 3.1

Timeline for data collection

Time	Researcher Activity	Class topics	Student Data Source
Pre-Study	IRB Approval Cover Letter Informed Consent Demographics		Demographics
Week 1	Identify Volunteers Observation Notes Reflection	Introduction.	
Week 2		Federal Holiday	Survey 1
Week 3	Interview 1 notes and reflections - Observation notes - Observation Reflection	Creating	Interview 1
Week 4	Observation notes - Observation Reflection	Collaborating	
Week 5	Observation notes - Observation Reflection	Interactive White Board	
Week 6	Observation notes - Observation Reflection	Digital Citizenship	
Week 7	Observation notes - Observation Reflection	Mobile Applications	
Week 8	Observation notes - Reflection	Accessibility	Survey 2
Week 9	Interview 2 notes and reflections	Spring Break	Interview 2
Week 10	Observation notes -Observation Reflection	Simulations	
Week 11	Observation notes Observation Reflection	Building an Online Quiz	
Week 12	Observation notes - Observation Reflection	Analyzing Data	
Week 13	Observation notes - Observation Reflection	Analyzing Data	
Week 14	Observation notes - Observation Reflection	QR Code	
Week 15	Observation notes - Observation Reflection	Technology Portfolio	
Week 16	Interview 3 notes and reflection - Observation notes- Observation reflection	Technology Portfolio	Interview 3
Post	Instructor Interview notes - Instructor interview reflection		Instructor Interview

Table 3.1 shows the timeline for data collection on a week by week basis. Further information about the nature of each data source is contained in this section.

Using surveys to better understand qualitative case studies is not new. Yin and Heald (1975) advocated for the use of a case survey methodology to add to the reliability of case studies. Yin (1981) further supported the case for case studies using survey instruments as one of a variety of data points. As qualitative case studies became more commonplace, the use of surveys as a point of data became normalized. As using multiple data sources enhance credibility (Patton, 2002, Yin 2013), case study is in the unique position where it can incorporate the collection and integration of quantitative survey data points qualitative analysis. This can lead to a more holistic understanding of the phenomena under investigation (Baxter & Jack, 2008).

Classroom observations. Direct observation has been described as the gold standard of data collection techniques (Murphy & Dingwall, 2007). Observing people in their natural setting avoids problems in self-reported data (Mays & Pope, 1995). It can reveal insights not accessible for other data collection methods such as interactions, processes, structures, or behaviors that participants were not aware of (Furlong, 2010). Approaches to observation vary according to the purpose of the research and the role the researcher plays. Traditional non-participatory observations were a part of ethnographic studies, whereas participant observations occur when the observer is also a participant (Morgan, Pullon, Macdonald, McKinlay, & Gray, 2017).

In the classroom setting, observation is a key part of the data collection process. For example, Cook, Walker, Weaver, and Sorge (2015) conducted a study of innovative science lessons using observation notes as their sole means of data collection. Similarly, Watson, Mong, and Harris (2011) used observation of student behavior when playing an online game as an indicator of student engagement. In terms of TPACK, Elmendorf and Song (2015) examined their development of an observation tool to measure teacher efficacy in implementation of

TPACK. For this study, I wanted to know not just what the participants were expected to learn, but how they went about their learning. I wanted to see what interactions occurred between students, and how the instructor modelled pedagogical practice with technology. To achieve this, it was essential that I conduct classroom observations.

I therefore observed all classes, making open ended, unstructured notes and observations as class occurred in a journal. Within 24 hours of each class I transcribed my notes into an electronic journal, and added any pertinent thoughts or reflections. These helped to create context for the learning of the participants, and provided stimulus for conversations in future interviews with the participants. Throughout this study, observation data provided for a foundation from which I could pursue the inquiry. Although my role was to be strictly a non-participant in the classroom, there were times when I gave assistance to students or helped to clarify misunderstandings. These incidents also helped me as a researcher to better understand the learning with occurred as well as the problems students might be having with it. In my reflections, I would occasionally note a problem I had with the method of instruction, or frame a question for clarification in a later interview with the class instructor. Performing observations provided valuable insight into the learning of the participants.

Class documents and artefacts. I also wanted to gain more insight into the workings of the class beyond my observations. As a result, I chose to use document analysis which is a non-intrusive means of analysis providing insight into things that may not otherwise be observed. (Patton, 2002). I began by collecting the syllabus and course outline, then gathering all available information available in the class learning management system (Blackboard TM). This provided me with copies of class multimodal readings, instructions and rubrics for each assignment, as

well as copies of each participants' assignment submissions. These all provided for information rich data which I collected on an ongoing basis throughout the semester.

I examined each of these documents to gain a better understanding about the participants' knowledge of TPACK and to see if class experiences influenced their decision. Perhaps the most important class documents were the TPACK lesson plans which participants created as part of their assignments. An example of a TPACK plan can be found in Appendix 7. These were revealing of participants intended enactment. I used them to promote discussion about changing beliefs with the participants in their later interviews. They also served as data sources for comparing with participants' TPACK survey responses.

It is appropriate to use class documents as multiple data sources to develop a comprehensive understanding of factors influencing the case (Yin, 2014). Moreover, they provide validity in the research design too. As I demonstrated in Chapter Two, a critique of case studies investigating technology in the social studies is their limited use of data. By using such a variety of class documents, it was my hope to add a layer of validity and trustworthiness to the study.

Interviews. Kvale (1996) states that if you want to find out “how people understand their world and their life, talk to them” (p. 1). However, this is not a self-evident process. Success in interviews relies on the “knowledge, skills, vision, and integrity of the researcher” (Rabionet, 2011, p. 565). The aim of conducting interviews in a qualitative study is to reveal insights that wouldn't be gained from any other data point. Interviews are supposed to elicit participants' “accounts of aspects of their experience, rather than to gather answers to specific questions as if they were variables in a survey” (King & Horrocks, 2010, p. 37). Interviews should capture the context of personal experiences (Seidman, 2006) and assume the most

important reality is what participants perceive it to be (Kvale & Brinkmann, 2009). Therefore, questions should be adaptable and able to change as necessary (Patton, 2002). As I wanted to collect authentic data that went beyond a qualitative survey, I opted for the more flexible option of using semi-structured interviews. Completely open-ended interviews might not elicit responses from participants which relate to the research question (Rabionet, 2011). So semi-structured interviews were the best approach.

Using Kvale (2008) as a guide, I ascertained that I needed to conduct more than one interview, in an attempt create a more open working relationship and dialogue with participants. Moreover, Seidman (2006) advocates that there is much to be gained from conducting three interviews. One at the beginning of the course, in the middle, and at the end, using the responses from each one to build into the next. I chose to adapt this method, integrating the data from the surveys, along with class artefacts and students work to create further opportunities and discussion points. My aim was to use the interviews to demonstrate how well I understand possible changes in the participants and triangulate those changes with their experiences of the class. I was careful to include statements of confidentiality and care in the opening interviews, as recommended by Rabionet (2010). I spent much time crafting the semi- structured interview questions, testing them out with peers and colleagues for clarity. I also made note of possible follow up questions where appropriate, constructing the interview protocols for each stage to encourage deep discussion (Kvale, 2007).

The first interview focused on the initial survey and the participants' own experiences of social studies pedagogical practice in their K-12 career. It was used in conjunction with the surveys to determine their level of TPACK at this early stage of the class and their own development as teacher candidates. The data of the second survey served as a focus of

questioning for the later interviews. Any changes in scores served as a discussion point. The second interviews also sought to gain insight into the participants' preconceptions and beliefs about TPACK and social studies education, as well as how these beliefs were reflected, if at all, in the class documents. In the final interview, I used the surveys as a discussion point, but also asked about the participants' lesson plans and future enactment of aspects of TPACK, as well as how they might define their burgeoning rationales for teaching secondary social studies.

King and Horrocks (2010) recommend interviews should be conducted in a quiet location, agreed to by both interviewer and interviewee. Where possible, it should be recorded and notes taken to supplement not only what is said, but to note aspects like non-verbal cues. In this study, I conducted interviews in an office in the College of Education. Times were mutually agreed by participants and they all agreed to have recordings transcribed. Once recorded, each interview was professionally transcribed. Transcriptions were shared with the participants and member checked for accuracy.

There were approximately 11 hours of interview data transcribed. The interviews proved crucial in revealing insight about the beliefs and dispositions of the participants and their potential for change through their participating in the class. Follow up questions were asked where possible to reveal why changes occurred and what role the educational technology class played in prompting change.

The course instructor was also interviewed after the conclusion of the semester. The intention of this interview was to reveal insight into any educational purposes and intentions. Questions focused on the development of technological, pedagogical, and content knowledge in preservice teacher participants. Conducting this interview also provided an opportunity to reflect upon class documents produced by the participants and how they might inform the instructors'

future practice. This interview lasted for approximately 75 minutes and as with participant interviews it was recorded, professionally transcribed, and member checked for accuracy.

Data Analysis

A two-stage analysis of case study data was recommended by Merriam (1998). Data collection and analysis in qualitative studies are interactive processes, as well as “recursive and dynamic” (p. 155). Merriam states how in the first stage, data should be simultaneously analyzed while it is being collected, allowing the process to become more intensive over time, and even more so once all data is collected. For this study, I attempted to derive meaning for from the data using analysis techniques that complement case study. As data was generated, I read and re-read the data sources, particularly the interview transcripts and in class materials as these provided the richest descriptions (Patton, 2002). From here it was possible to develop initial codes. This occurred in three steps, firstly line by line, then by paragraphs, then as whole documents. Table 3.2 below shows examples of initial codes derived from multiple data types.

The first stage of coding, open coding, is often used in grounded theory or any practice in which the researcher is unsure of what theory might emerge (Corbin & Strauss, 2008). Following the recommendations of grounded theory researchers, I asked a set of questions of the data as I coded: ‘What is this data a study of?’, ‘What category does this incident indicate?’, ‘What is actually happening in the data?’, ‘What is the main concern being faced by the participants?’, and ‘What accounts for the continual resolving of this concern?’ (Glaser, 1998, p. 140). These questions kept me focused on theoretical sensitivity, transcend and encouraged a focus on patterns among incidents that yield codes. Furthermore, line-by-line coding forces the researcher to verify and saturate categories, minimizes missing an important category, and ensures relevance by generating codes with emergent fit to the substantive area under study. It also

Table 3.2

Examples of Initial Codes – line by line

Data Point	Description	Initial Code
Module 1 Title	Module 1 Digital Age Teaching	sets context for educational technology course
Course Syllabus page 4	Course Description: Classroom technology and learning strategies are explored through reflection, projects, and a research paper.	Use of reflection and projects
Class materials	Collaborative assignment sheet (instructions)	Evaluate Web 2.0. Support collaborative learning.
Instructor lesson plan	Objective: Utilize a Web 2.0 tool to conduct group presentations that allow users to share their screens	Sharing- Collaborative Learning.
Observation notes	Observation notes 1: Students able to self-start on assignments and navigate the site for that week's work	student centered instruction
Student TPACK plan	Activity - student will create a quiz game using a Web 2.0 tool to help learn the information.	Create quiz - working at describe level.
Interview notes - Participant 1 interview 1	Most of his social studies experiences at elementary school was busy work. Lots of learning facts and little application.	Experience - "busy work" facts.
Interview transcript - Participant 1 interview 1	...that was when I first really started to learn at a quick pace and started to learn a lot and had interactions with teachers who were very enthusiastic	biography - enthusiastic teachers

ensures relevance of the emerging theory by enabling the researcher to see which direction to take.

When coding the data as larger chunks, or paragraphs, I followed Saldana's (2002) recommendation and allowed for initial codes to be collapsed, subsumed, rearranged or reclassified. This process, like rearranging or redecorating a room afforded me a chance to develop an understanding of the data in relation to the research question. The initial codes generated from this data analysis was recorded in a code book, which was electronically transcribed, a screenshot of this digital codebook can be seen in figure 3.3 below. Each data type was given its own tab, while the data source, an extract from the data, and a new code, were recorded. In the instance shown on figure 3.3 below, these are part of the interview data.

	A	B	C
305	Participant 4 (David) Interview 3	Class activities related to social studies teaching: Review quizzes, engagement, critical thinking.	Review. Assessment, engagement, critical thinking.
306	Participant 4 (David) Interview 3	Thinking about SS instruction - Different to beginning of semester. Now see it as a way to make fun and engaging. Varied assignments.	Technology makes social studies fun and engaging. Varied assignments.
307	Participant 4 (David) Interview 3	Viewpoint on how SS should be taught. Engagement is key. Allow for students to think on their own.	Students centered - students think on their own.
308	Participant 4 (David) Interview 3	Potential with online assignments.	Online work - potential for student centered.
309	Participant 4 (David) Interview 3	What prompted change in viewpoint? The more I learned about technology, the more I gravitated toward it.	Shifting viewpoint.
310	Participant 4 (David) Interview 3	What do you teach SS for? Important to teach students about past. Civics for political engagement. Provides context for other subjects.	Rationale development - Past is important - civics and political engagement - context for other subjects.
311	Participant 4 (David) Interview 3	Technology is useful for conveying the content. Lots of value in lecture and note-taking. But if only lecture and note-taking - something missing.	Tech for content delivery. Value in lecture but not only.
312	Participant 4 (David) Interview 3	Future - learn more about classroom management and teaching. Create a better foundation.	Learn more about classroom management.
313	Participant 4 (David) Interview 3	430 - I paid attention to tech in my observations.	Pay attention to tech.
314	Participant 4 (David) Interview 3	Technology can be used to structure the process. Using powerpoints for outlines.	Technology - structure teacher centered lessons.
315	Participant 4 (David) Interview 3	Thinking influenced by flipped instruction model.	Influenced by flipped instruction.
316	Reflection Participant 4 Interview 3	Course got him thinking about the role that technology can play to engage students.	Thinking about role of technology.
317	Reflection Participant 4 Interview 3	He is good at history...informed his position when it comes to how he envisions it being taught. ...afforded him a chance to explore other ways that the students might be engaged.	Good at history. Influenced his vision.

Ready Count: 3

Figure 3.2. Snapshot of the Digital Codebook

The third stage involved re-examining each document and comparing to the initial code book. Where possible I noticed repeated codes, ideas, and concepts and these were used to create generate themes which formed the key findings. Table 3.3 – 3.6 illustrate how data became

initial codes and then merged together into iterative codes which collapsed to become key findings.

Sometimes there is confusion between a code and a theme, Rossman and Rallis (2003) explain the differences: “think of a category as a word or phrase describing some segment of

Table 3.3

Key Finding 1

Data Source	Initial Code	Iterative code	Key Finding
Participant 2, Interview 1, Researcher Reflection.	First time he has had to think about designing instruction, so TPACK plans as asked for in the course are a great way to enter lesson planning.	First time designing instruction. TPACK framework provides entry into lesson planning.	Evolving Understanding of TPACK
Instructor Interview	Beneficial to use TPACK as a model.	TPACK - beneficial.	Evolving Understanding of TPACK
Participant 1, Interview 1, Transcript.	TPACK - Tech: "I don't see it as a burden to learn something new or to learn how to maneuver through the new Windows or the new Macintosh. Like I don't see that as a burden. I see it as something that is fun, something interesting, so yeah, when new technology comes out, I just find it enjoyable".	Good at TK	Evolving Understanding of TPACK

your data that is explicit, whereas a theme is a phrase or sentence describing subtler and tacit processes” (p. 282). After undergoing constant comparative analysis, I then had to examine the data to see if and where participants’ beliefs and preconceptions were influenced by participation in the class. To do this I had to use a technique known as “Chronological Sequencing” (Yin, 2014, pp. 153-155).

Table 3.4

Key Finding 2

Data Source	Initial Code	Iterative code	Key Finding
Participant 5, Interview 3, Transcript.	I think presentations are a real big one - guest speaker type stuff...for example, if you have video, like YouTube of somebody who does presentations on a specific type of culture...	Rationale - how technology will help	Developing Rationale and Vision for Teaching Social Studies
Participant 5, Interview 3, Transcript.	One of the things I like to focus on most I guess is culture, world culture geographically.	Rationale - teach for culture	Developing Rationale and Vision for Teaching Social Studies
Participant 3, Interview 2, Transcript	...being able to lecture and then read and then processing that information and putting out like a - even just a three-page paper, because I think being able to create your own writing really is the key in what the argument is because everything is an argument in Social Studies for the most part.	Rationale: Pedagogy: lecture notes write.	Developing Rationale and Vision for Teaching Social Studies

Chronological Sequencing

For this study, I took the data from the initial codebook, which was further analyzed to produce a more condensed and focused second codebook. I then further analyzed the data

looking for themes or patterns which could be organized against the chronological events of the class (Yin, 2014). Yin argues that there is much value in using chronology when creating a case.

It is more of a descriptive device as it serves an analytical purpose. In this circumstance I could

Table 3.5

Key finding 3

Data Source	Initial Code	Iterative code	Key Finding
Participant 3, Interview 3, Transcript	I don't think it moved me away so much, but I can see in a high school setting doing just activities to break up lecture and stuff, so I still haven't found something that's going to revolutionize the teaching of Social Studies in a classroom setting.	Not thinking differently about pedagogy. Still teach from lecture.	Influencing Pedagogical Decision Making
Participant 5, Interview 2, Transcript.	The course specifically made me think a lot about...more of the relay of that content knowledge.	Course - made participant think about pedagogy.	Influencing Pedagogical Decision Making
Participant 3, Interview 3, Transcript	I don't think it moved me away so much, but I can see in a high school setting doing just activities to break up lecture and stuff, so I still haven't found something that's going to revolutionize the teaching of Social Studies in a classroom setting.	Not thinking differently about pedagogy. Still teach from lecture.	Influencing Pedagogical Decision Making

use multiple data points to build a cause and effect relationship between the participants'

developing understanding of their enactment of TPACK, and how they may contradict their

initial beliefs or epistemologies. Although this was not a full-time series analysis, by

chronological sequencing it was possible to construct a narrative of the educational technology

class as a case, and evidence events or critical incidents arising. This approach can be richer and more insightful than general time-series approaches” (p. 154). As I conducted iterative data analysis, I noted how aspects of the course influenced the participants to consider their future practice regarding their preconceptions. I made a brief note in a table as shown below. The intention was to use the weekly themes to cross reference other data points, for example, interview transcripts with participants’ TPACK plans. I had to be careful with making causal inferences. I could not be satisfied that one piece of evidence for example, an extract from a participant interview indicating a change of understanding, is enough evidence to attribute to a cause. In this way, chronological sequencing is like explanation building (pp. 147-150), as this analytical approach explained the extent to which existing practices in the educational technology class support existing theories of preservice teacher education (for example, rationale building to combat preservice teacher issues of belief), and provided an outcome measured against the TPACK framework.

Trustworthiness

Yin (2014) defines trustworthiness in case study research as, “the consistency and repeatability of the research procedures used in the study” (p.240). In this study the intention was to maximize validity. To achieve this I focused upon credibility, transferability, authenticity, and substantive validation (Lincoln & Guba, 1985). By including observation data in my study and supplementing the notes with reflections, I allowed for the possibility of understanding multiple causes (Erickson, 2012; Miles & Huberman, 1994; Yin, 2013).

Baxter and Jack (2008), offer a list of strategies to ensure trustworthiness in qualitative case study research. Firstly, they argue that the study is rooted in a question which is substantiated in the data collection. They ask that the study design in appropriate for the

Table 3.6

Key Finding 4

Data Source	Initial Code	Iterative code	Key Finding
Participant 2, Interview 2, Transcript	The role of the teacher is to influence generations...and you really want to reach those children and if you are not saying that you couldn't reach them as being a pen and paper person, you know, because it's all about attitude, and personality, and relationships, but I mean, you've got to make the class a little more interesting in the sense of grasping their attention and so for that reason, it just only makes sense to go ahead and just kind of bite the bullet.	Change of rationale. Change of attitude toward use of technology.	Challenging Predispositions
Participant 1, Interview 2, Transcript.	[the course] sees technology as something - it's like I think it sees it in a way that the students see it, that students get excited when there's new technology, and you know, I'm sure if a student gets a new iPad for their birthday, they want to bring it to the school, and you know instead of telling them no and you know, making a big thing where they are going to want to do it anyways, and you have to punish them, you can kind of find I guess ways to almost trick them into using it for educational purposes, and you know, I think the ...like the less fights or you can get in with students or like the less conflict there is the better."	Positive attitude to technology, interest in embracing it.	Challenging Predispositions
Participant 3, Interview 3, Transcript	I think discussion boards are a bit tedious.	No change in position, discussion boards are not good for learning.	Challenging Predispositions

Table 3.7

Chronological Sequencing

Time	Class topics	How class directly influenced participation
Week 1	Introduction.	Flipped instruction. Student centered learning.
Week 2	Federal Holiday	
Week 3	Creating	Web 2.0 tools
Week 4	Collaborating	Student centered instruction - Collaboration
Week 5	Interactive White Board	Content knowledge - help content delivery
Week 6	Digital Citizenship	Use technology to reduce conflict. Teachers accept social media as a tool. Web 2.0 and infographic useful for students
Week 7	Mobile Applications	Student collaboration
Week 8	Accessibility	Teaching students with disabilities.
Week 9	Spring Break	
Week 10	Simulations	
Week 11	Building an Online Quiz	Pedagogical knowledge - assessment
Week 12	Analyzing Data	Administrative role of teacher
Week 13	Analyzing Data	
Week 14	QR Code	
Week 15	Technology Portfolio	Project based learning as alternative assessment
Week 16	Technology Portfolio	

Baxter and Jack (2008), offer a list of strategies to ensure trustworthiness in qualitative case study research. Firstly, they argue that the study is rooted in a question which is substantiated in the data collection. They ask that the study design in appropriate for the research question. Purposeful sampling strategies should be used. Data should be collected and managed systematically. Finally, data should be analyzed correctly. It is my contention that this study fulfils those requirements. Moreover, thick, rich descriptions of findings provided the

foundation for qualitative analysis (Patton, 2002). My own interpretative lens structured the descriptions, "...explaining the findings, answering 'why' questions, attaching significance to particular results, and putting patterns into an analytical framework" (p.438). Patton asserts that thick description involve the researcher constructing a web of details about context and relationships, feelings and voices, drawing together the individuals to each other. Thick description also provided the framework from which interpretation is built. (p. 503). My methods of analysis promoted idea convergence in the findings (Baxter & Jack, 2008), while the integrity of the data was enhanced using member checking, a strategic tool used to establish trustworthiness. In the context of this study, after exiting the field, interview transcripts and codebook were made available to all participants to ensure accuracy, seek clarification, and pinpoint instances of researcher bias.

Triangulation of the data (interviews, lesson plans, and class documents) were used to determine consistencies and differences within findings (Meriam, 1998; Miles & Huberman, 1994; Yin, 2014). Through use of constant comparison, and having the luxury to return to the data on multiple occasion, I was also able to double-check my coding process (Krefting, 1991), which is another way that I can ensure integrity in my interpretation. Furthermore, convergence of the data also provided a greater contextual understanding of the beliefs, preconceptions, and dispositions of teacher candidates. In this study, this occurred when the data was compared to the theoretical framework (Figure 3.1) and other possible emerging theories arising from analysis of the findings.

Finally, a comprehensive record of all the documents was maintained. This audit trail included such items as: IRB exemption papers, logic models, informed consent forms, records of

researcher and participant communication, interview transcripts, lesson plans, class documents, and multiple iterations of the codebook as it evolved.

Limitations

According to Yin (2014) there are also specific limitations that pertain to this method of analysis. Firstly, the researcher must be mindful, sensitive, and insightful when constructing patterns. Because this is an iterative process, it is possible for the researcher to move too far away from the original topic, resulting in findings that do not meet the needs of the research question. Secondly, there is also a risk of selective bias, which could occur if the researcher adopts an explanation that is not consistent with key data. These limitations were minimized through the maintenance of a chain of evidence and codebook, and adhering to the collection of specific data for analysis.

Other limitations pertaining to this study included the limited scope and sample size of the case in question. Studying one class does not necessarily allow for the possibility of generalizing findings. However, case studies are not intended to be generalizable, but to serve as an insight in to a population which can inform other practitioners and researchers working with similar populations (Creswell, 2012). Moreover, Chapter Two highlighted a need for research about how secondary social studies teacher candidates understand and develop TPACK. This makes it hard to derive an already existing theoretical framework to use in the study. As a result, by adapting a theoretical framework based in the general educational research, it is possible that this study may have formed an inaccurate theoretical lens from which to make conclusions. However, it is possible to view this limitation as a strength because the lack of an existing theoretical framework on preservice social studies teacher learning affords this study some latitude to construct and identify emerging theory from the findings. Moreover, I intentionally

used multiple data points in this study: surveys, interviews, observations, class artefacts, and lesson plans, to attempt to create as rich an understanding of the phenomenon in this context as possible. Therefore, although limitations are evident, measures were taken to overcome them where possible.

Summary

In this study, I sought to examine the complex factors concerning the learning of preservice social studies teachers and their developing understanding of TPACK. This study examined the influence of an educational technology class on preservice secondary social studies teachers' technological, pedagogical, and content knowledge (TPACK). Participants were students enrolled in an educational technology course in the spring semester, 2016, at a large, research-intensive university on the East Coast of the United States. Volunteers from this course were sought to participate in this study. Participants completed two online surveys (at the beginning, and after the mid-point, of the class), as well as undergo three semi-structured interviews which focused on different aspects of the educational technology course experience, as well as the participants emerging understanding of social studies pedagogy. Other data collected came from class documents such as discussion board posts and lesson plans.

Additionally, the course instructor was interviewed to ascertain an understanding of the educational aims and intentions regarding the development of TPACK in the class participants.

The data underwent a two-part analysis. An iterative constant comparative approach was utilized to reveal themes recorded in a codebook in the first stage. In the second stage the codebook underwent chronological sequencing to construct a narrative of critical incidents or events related to the developing theoretical framework. In the next chapter, Chapter Four, I will describe the context in which the findings emerged. This includes information about the class,

the participants, and the instructor. Chapter Five will be a narrative reporting of the findings, sequenced into key events and themes or factors. These will reveal the aspects of the class as they influenced teacher candidates' beliefs about technological, pedagogical, and content knowledge (TPACK). Chapter Six will be a discussion of the results in the context of the research and emerging theoretical framework. This chapter will also position all results in the context of future research possibilities and direction to better understand the learning of preservice social studies teachers.

CHAPTER 4

CONTEXT

In Chapter Four I intend to outline the context in which the study was carried out. I will begin with an overview of the college setting in which the class resided, after which I will focus attention on the class itself. I will provide a brief description of the class instructor of record, who also happened to be responsible for the design of the class. I will outline her rationale behind the class redesign and her intended learning outcomes. From here I will describe each module as it is outlined on the class syllabus, with any extra details added from my own lesson observations. After this, focus will turn to the five participants. I intend to give a brief description of each, with information on their school biography as outlined in their initial interviews, as well as any burgeoning preconceptions and beliefs they held at the outset of the class. This contextual information will help to better understand the case and make sense of the findings explained in the next chapter as well as my discussion points and implications. However, to begin with I shall begin by briefly outlining the setting in which this class occurred.

The Setting

This case study was set in an educational technology class, delivered at a large, urban university on the East Coast of the United States. For the purposes of this study it shall be referred to by the pseudonym, East Coast University. Per the Carnegie classifications (Indiana University, 2018), the university is designated a higher research activity with an enrollment of over 24,000 students at undergraduate, graduate, and doctoral levels. Of these, 19,000 are undergraduate students. These numbers have remained consistent for the past five years.

Approximately one quarter of students enrolled at East Coast University are part-time, commuter or distance learning students. In addition to its main campus, the university also has

satellite campuses in three local towns and offers many of its classes online asynchronously, synchronously, or in a hybrid environment where students can opt to meet face-to-face, online at home, or via a distance learning classroom on one of the satellite campuses. Enrollment is diverse, with representation from every state and 88 different countries at the time of the study. Demographically, the student population is approximately 55% female to 45% male, while ethnically, approximately 50% of students are Caucasian, 30% African American, 3% Hispanic, with the rest comprising Native American, Pacific Islander, Asian, or unknown ethnicity. East Coast University has over 1500 faculty, with an average teacher to student ratio of 18:1.

The educational technology class under investigation was taught in the Department of Teaching and Learning, itself housed in the College of Education. Teaching and Learning at the College of Education is responsible for 13 undergraduate programs, and according to the college of education website, boasts to have over 60 graduate programs. The class used for this study contained students who were seeking secondary initial licensure via the undergraduate or graduate tracks. Undergraduate students earn a Bachelors of Arts in History with a concentration – and licensure – in teacher preparation. Graduate students, who already hold an undergraduate disciplinary degree, earn a Master's of Science in Education and receive licensure. By the time undergraduate students take the class, they should have completed two years of coursework for their major and were at the beginning stage of their education coursework. In contrast, graduate students enrolled in the course take it at the start of their degree program.

Indeed, the programmatic structure was such that the participants in the study were yet to be fully admitted into the teacher licensure program, as acceptance was conditional on their performance in their coursework thus far. For undergraduate entry into the program, they need to obtain a minimum GPA of 2.75 in their academic major and professional education classes and

achieved a passing score on the state Praxis I assessment. Moreover, there are minimum SAT and ACT scored requirements for admission into the program. Along with meeting these criteria, undergraduate applicants also need two letters of recommendation from class instructors attesting to their quality of work ethic, character, and suitability for a career as educators. Furthermore, any coursework earned with a grade below C cannot be used in their application for entry into the program. Once entry into the program is accepted, teacher candidates must pass the content area Praxis test, referred to as Praxis II, complete an educational foundations class at minimum, and undergo a criminal activity clearance check to allow them to be placed in schools.

As I will explain later, all the participants in this study were undergraduate students and had not yet been accepted into the program. As such, prior to acceptance they were permitted to take the Foundations in Education, reading in the Content Areas, Educational Technology, Classroom Management, Human Growth and Development, or Students with Diverse Needs classes before applying for admittance. Table 4.1 below shows the professional courses teacher candidates need to select in their recommended order. It should be noted how they are also permitted to take these classes in any order, however, they were not permitted to take content methods, participate in the Teacher Seminar, nor do their Candidate Internship without admittance to the program. Usually, once students have gained admittance, successfully passed the requisite courses and achieved admittance, they can then take content methods and teacher seminar, before completing their requirement with the Candidate Internship. In total, undergraduate professional classes total to 33 credit hours. This is in addition to the requirement needed for their content major.

Table 4.1

Undergraduate Professional Program for Social Studies Licensure - Professional Education Coursework Requirements

COURSE	COURSE TITLE	COURSE DESCRIPTION
TLED 301	Foundations and Introduction to Assessment of Education. 3 Credits.	Introduces the historical, philosophical, and sociological foundations and contemporary issues of American public education. Includes the use and analysis of assessment data and the construction and interpretation of assessments. Students are expected independently to register for and take the Praxis I examination while enrolled in this course. Students in 6-12 or 6-8 programs will complete a 30-hour observation/participation experience in an appropriate 6-12 setting. (qualifies as a CAP experience) Prerequisites: sophomore standing.
TLED 430	PK-12 Instructional Technology. 3 Credits.	In this class, contemporary productivity tools and Internet resources are used to develop and evaluate instructional plans and techniques. The course is designed with three components. The first is on understanding models for effectively integrating technology into the curriculum. Next, the focus is on evidence-based good teaching practices that span across grades and subject levels, and the technologies and ways of using those technologies that support those practices. Finally, the focus is on technological tools that support the teacher in their everyday duties. Upon completion of this course, students should be able to pass, or apply for exemption from their school district's TSIP exam. Prerequisite: TLED 301
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence. 3 Credits.	This course will contribute to an understanding of the physical, social, emotional, and intellectual development of children and adolescents and the ability to use this understanding in guiding learning experiences. The interaction of children and adolescents with economic, social, racial, ethnic, religious, physical and intellectual differences will be explored. Developmental issues related to giftedness or disability and the impact of family disruptions, child abuse and substance abuse are included. Prerequisites: junior standing.
TLED 408	Reading and Writing in Content Areas. 3 Credits.	This course examines and promotes literacy development in all content areas, including the development and use of disciplinary comprehension and writing/production skills. Students will explore and consider a repertoire of questioning strategies, and strategies in literal, interpretive, critical, analytical, and evaluative comprehension across the curriculum, grades 6-12. Prerequisites: a grade of C- or higher in TLED 430 and SPED 313 or a grade of C- or higher in one of the following: SEPS 297, MUSC 300, TLED 301, STEM 351, MUSC 335T, ARTS 279, HPE 200, and HPE 317.

TLED 360	Classroom Management and Discipline. 2 Credits.	Examines theories, research, and practices involved in classroom management, motivation, and discipline. Explores techniques for organizing and arranging classroom environments that are most conducive to learning. Prerequisites: TLED 290 or TLED 301 or MUSC 300 with a C- or higher.
SPED 406	Students with Diverse Learning Needs in the General Education Classroom. 3 Credits	This course introduces general education teachers to the legal aspects and educational needs of at-risk students and those with disabilities. Emphasis is on characteristics of children with special needs and procedures for effective academic, behavioral, and social integration of these children in the general education classroom. Prerequisites: junior standing.
TLED 455	Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies. 3 Credits.	Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in social studies, grades 6-12, informed by national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. Corequisite: TLED 483. Prerequisites: TLED 301 or TLED 290, TLED 430, SPED 313, passing scores on Praxis Core or Praxis I (if passing scores were achieved prior to January 1, 2014) or equivalent SAT scores as established by VA Board of Education, a criminal background check, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75.
TLED 483	Seminar in Teacher Education. 1 Credit.	Explores issues, problems, concerns, and processes related to teaching and to entering the profession of teaching. Passing score on PRAXIS II in licensure content area, passing scores on the Virginia Communication and Literacy Assessment (VCLA), and where appropriate passing scores on the Virginia Reading Assessment (VRA) are required to pass this course. Prerequisite: admitted to approved teacher education program.
TLED 485	Teacher Candidate Internship. 12 Credits.	Internship in school. Available for pass/fail grading only. Prerequisites: completion of all course work in an approved program in teacher education, passing scores on PRAXIS I or equivalent SAT or ACT scores as established by VA Board of Education, passing scores on the appropriate PRAXIS II content examination, passing score on the Virginia Communication and Literacy Assessment, departmental approval, permission of the director of teacher education services, grade requirement in the specific content area and professional education core, minimum major and overall GPA of at least 2.75 and a criminal background check. (qualifies as a CAP experience).

As undergraduate students considering entry into the education program may take a variety of courses prior to admission, we should not that for the participants in this study, the educational technology class was the first education class they took. This is because although it is early in student's professional learning of education, the Educational Technology class is essential as successful completion of the class fulfils state technology requirement for licensure. Therefore, students are often advised to take this class along with the Foundations in Education class as their first professional classes in education.

The Instructor

The instructor of record for the class under investigation held the rank of Assistant Professor at the time the study was conducted. For the purposes of this study she will be referred to as Linda (pseudonym). She was in her third year as a faculty member of the college of education, having obtained her doctorate in 2013. Her research specialized in mobile learning, STEM education, and technology enhanced learning. Initially her research was bounded by an interest in how mobile learning connects to mathematics education at the elementary and middle grades, however, she has since expanded her research to position herself as a global expert on all aspects of mobile learning.

Her over 20 years classroom experience began in elementary education in her native country of the United Kingdom (College Website). Her career began as an elementary teacher and soon became an Information Communication Technology coordinator while she taught in the classroom. Linda's experience with technology integration during her time working in elementary schools the United Kingdom informed her professional development once she moved to the United States, where she continued to focus on technology integration in elementary education, earning a Master's of Education. in 2009, and her doctorate in 2013.

One of Linda's roles at East Coast University is to leverage her expertise with online learning to rewrite and model the Educational Technology class delivered at the college. During the Spring Semester of 2016, when I conducted this study, she had just unveiled her new iteration of the class and was tasked with piloting it. This meant that the case study for this dissertation would focus on how she delivered this new model for the educational technology class.

Instructor's rationale behind the new information technology class. To meet the technology requirement for state licensing, the College of Education traditionally offered the educational technology class as a standalone option. This is not always the case with other institutions, who seek to embed components of educational technology into other aspects of the coursework, for example, methods coursework classes. However, the class as it stood was considered outdated and needed extensive restructuring. Subsequently, for spring 2016, the other instructors of the class would continue to teach the older iteration, while the instructor in this study would pilot the new version. It was hoped that by fall 2016 only the new iteration would be offered and taught to students.

One of the problems associated with the class redesign was the many ways it is delivered, and the many different instructors who teach it. When redesigning this class, the instructor had to take into consideration the fact that because the class is a part of the technological requirement for licensure, it would always be in high demand. As a result, in any given semester it might be delivered by different instructors with varying levels of experience and expertise with the class. These included, but were not limited to, full-time faculty, full-time lecturers, part-time adjunct instructors, and graduate teaching assistants. The class was also intended for delivery to students in differing formats. As a result, the class had to be designed to be deliverable in online and face-

to-face environments, and both synchronously and asynchronously. She noted, “This was a design challenge...making it accessible, easy to follow, and deliverable” (Instructor interview). Linda had to pay close attention to the class structure, consider how each module might be delivered in each context, and provide enough information in the readings so that the instructor could facilitate learning rather than act as a content expert. As a result, she aimed to adopt a student-centered model of teaching, without “giving them too much cognitive overload” (Interview). Part of her challenge was to make the class accessible to students who had limited professional education experience, modernize the class to align with the needs of modern K-12 teaching environments, and maintain a level of rigor necessary for the class to fulfil state technology licensure requirements.

For the iteration under investigation, the class was delivered face-to-face in a traditional classroom setting. Additionally, the instructor opted to use a “flipped model” of instruction in which students would conduct multimodal class readings online on their own time, then use most of class time to complete the products necessary to evidence their learning (Flipped Learning Network, 2014). Linda viewed this as an opportunity to model student-centered learning and demonstrate to the students how flipped instruction could work. She also aimed to demonstrate how she can assess their work through mastery of performance tasks.

It is important to note Linda’s intentionality in her decision to adopt a flipped classroom design for this new iteration of the class. In her interview she described how the old iteration of the class was built on a rationale of “How to use technology,” whereas the new class was built on the rationale of how to do educational technology effectively using TPACK as a model for instruction. Effectively the old version of the class focused on what technological tools teachers needed to use, whereas the new version focused on how teachers might purposefully leverage

technology tools to assist with instruction. The key difference is in the use of the TPACK framework as a constant reference point in the new version of the class.

Another difference Linda pointed out in her redesign was how the previous iteration was teacher-centered in both delivery and modelling; whereas the new class was centered around the needs of the learner, both in the context of the course delivery and how students would later enact their learning of Educational Technology to make it learner-centered in their classrooms.

The instructor wanted her students to

transform learning...to get them thinking beyond the box...it's kind of a hard nudge toward thinking about technology integration, but not necessarily doing what you've always done.... the first class was all about how to get the schools to use technology. It has very little to do with incorporation. (Instructor Interview)

Linda's rationale was to use the class to make her students think about instruction with technology in a way they had not experienced before. Her focus for the course was on why teachers should use technology to enhance student learning, rather than on the more simplistic use of technology to support teachers content delivery in K-12 classrooms.

She also explained how existing educational experiences of the students were there to be challenged, "These students have come from an era where not only was it not advocated that you use it [mobile technology, cellphones, and personal devices], in fact, they were told the very opposite [do not use it]". She explained that technology, particularly mobile technology, was ubiquitous in the lives of the students taking the course; however, they have learned in environments where "their teachers, who they really respect, are telling them not to use it, plus now they're at college, so they've done fairly well through school...they saw the lessons they have had, they said no, they work [without technology]." As a result, she was adamant about

taking the focus on how to use basic technology tools [like word processors and PowerPoints] out of the course. Instead, “the purpose of the class is to understand how to incorporate technology into the curriculum, so it helps them through the rest of the [education] program. That’s the objective.”

Modeling best technology teaching practices was also an overt component of the course re-write. The intention of the instructor for this class was to model good practice and meaningful incorporation of technology. She noted, “I want to make it clear to them, because everything I do where I model what it is...I’m modeling all the time saying, ‘I’m modeling this, I’m modeling that.’” By doing so, her intention was to challenge the negative impression that students had about technology and pedagogy. She added, “Sometimes there’s a point to technologies where you don’t always see it, when you try and look for negatives.” She explained how in her experience this is often the default position of experienced teachers she works with. They will find a reason not to use a technology, rather than use it. It was clear to me that her rationale throughout the process of the class redesign was to challenge her students’ apprenticeship of observation.

Course Delivery

The class met weekly on Monday evenings from 4:20pm until 7:00 pm in spring 2016. This version of the class was taught face-to-face, although the course was designed to be delivered completely online or in a hybrid teaching environment. Traditionally, this class is offered in all three formats. However, because this was the first time the new version of the class was to be taught, it was decided that face-to-face delivery would best serve the needs of course development, while the old versions of the course would continue to be offered in all three

formats until this version of the course was established. The intention was to fully replace the older iteration in the fall 2016.

As I already mentioned, one of the major differences of the class was it was designed for delivery using a “flipped” model of instruction. The instructor made a conscious decision to use this delivery method as it would leverage the learning management system (Blackboard™) to its fullest. It would also afford the instructor a chance to model pedagogy that students would not be familiar with, thereby challenging their experiences of education thus far.

The instructor took care to introduce her reasoning for using the flipped model in her first class. She explained to her students how the flipped instruction model would work, emphasizing how flipped instruction catered to the needs of today’s students, referred to in her presentation as digital natives. There then followed a brief discussion about what flipped instruction was and was not, then an explanation of the model in the context of the class. She explained how at the beginning of every class meeting there would be a QR code taped to the door. As students entered the classroom they were expected to scan the QR code on their personal device, this would take them to a series of questions written using Google forms based on the week’s online readings. From the answers given, the instructor could ascertain who needed extra help, who was comfortable, and afford opportunities to address misconceptions. She explained how this was a way to use formative assessment to meet their individual needs. Once they had answered the questions, they could use class time to self-start on assignments, navigate the blackboard site for that week’s work, and use the instructor as a resource. While they worked, she could give mini tutorials or one-on-one instruction as needed by the students. In this way, she explained, she would better model her role as facilitator of instruction.

Course Modules

The course was divided into 12 modules delivered via Blackboard™. All modules consisted of introductory videos, most produced by educational faculty, and readings on the topic. Student understanding would be formatively assessed using the QR code and Google Forms as described in the section above. Students were regularly expected to create a product related to the course topic, usually in a TPACK instructional plan. Although not a full lesson planning framework, using this structure guided the students to consider how aspects of technology, content, and pedagogy could be used together. For convenience, they are referred to in this dissertation as instructional or lesson plans, even though they lack the more comprehensive features of a traditional learning plan. An example of a TPACK plan is in the Appendix section at the end of this dissertation. Some modules gave students' choice over their product type or technology tool used, others on how they might be used in instruction. Each module covered a different educational technology issue.

Module 1. Digital age teaching and learning. In each module, students were expected to consume multimodal readings. Sometimes these would be conventional articles or chapters, other times they might be videos or websites the students can interact with. Again, the purpose was to get the students away from considering a reading as printed pieces, and model how they might use digital media in their own instruction. For this module, students were expected to examine a short guide to Bloom's Taxonomy, and an article about Web 2.0, what it is, and how to use it (Light, 2011).

The main concept introduced in the module was TPACK, and its purpose in the context of the class. In class, students were tasked with introducing themselves using the discussion board feature of Blackboard™. Unlike other classes, they were expected to create a short

introductory video and post in the discussion area, while commenting on colleague's introductions by typing written responses. The intention here was to demonstrate community building using educational technology, while making the students introduce themselves in a different way to what they usually do in more conventional classes.

Lesson content and evaluation. For the first lesson, time was dedicated to introducing Linda as an instructor, the aims of the course, and the syllabus. The main objective of the lesson was to explain how the students would be using a flipped model of instruction, wherein they will have to take a test using google forms, by downloading a QR code posted on the door at the beginning of the lesson. Students were instructed to download a QR reader in the lesson and had the opportunity to practice with a test QR code. They were then organized into groups ready for the next module on creative and collaborative learning. Their homework assignment, which they could begin in class, was to post an introductory video about themselves on a discussion board on Blackboard TM.

Module 2. Learning by creating. For this module, there were resources to explain Web 2.0 in more detail, as well as an introductory video by the course instructor. Students were also given the rubric for their first assignment to create a TPACK plan using a Web 2.0 tool. To model what one might look like they were able to see some examples including class blogs, online office sites (like Google Docs), online classrooms (e.g. wikispaces), storage sites (e.g. Dropbox TM), and website builders (e.g. Wix TM, or Weebly TM).

This unit exposed students to Bloom's taxonomy and engaged them with their content standards. Web 2.0 tools were also introduced. Recall that Web 2.0 tools are internet websites which allow the user to interact with them to create products. Examples of Web 2.0 tools are website builders, online discussion boards, video editors, and picture editors. The learning

intention was for students to recognize that Web 2.0 allows students to create artefacts, rather than teachers creating content. Students were tasked with creating a TPACK plan that used Web 2.0 tools to deliver an aspect of content from the standards.

Lesson content and evaluation. Students took a quiz as they entered the room, accessed on their own device using a QR code taped to the door. The quiz assessed their understandings of the multimodal readings so far. The last question of this quiz, and every other quiz, was “do you have any questions or is there anything you would like to know.” Results from the quiz populated into a google sheet which the instructor accessed in her iPad. Using this information, Linda was immediately able to formatively assess who understood the readings, those students were instructed to go ahead and begin the class assignment. Those who did not, were organized into small groups for some teacher led instruction and remediation. Once these students were addressed, those that had any burning questions or issues were given one-to-one time.

For most of the lesson, students were expected to begin to compile their first TPACK plan I noted in my observation notes how, because many were unfamiliar with state standards, and not confident with the planning process, they “wrestled with their first plan” (Observation notes). Students first had to identify the state standards they wanted to teach, then find a Web 2.0 tool to use, and then explain how it might help teach the standard. For some of the participants, this was their first taste of pedagogical decision-making. Their final plan was due for submission by next class.

Module 3. Learning by collaborating. Prior to the module, students were expected to have viewed an instructor video on collaborative learning, an instructor produced sheet with everything they need to know about collaborative learning, broken down into easy to read bullet points, and instructions and a rubric for the assignment. For this module, more Web 2.0 tools to

facilitate online discussion were introduced in this module. The tools here allowed students to collaborate with one another and conduct online group meetings and presentations. Applications such as Google Hangout and Skype were featured in this section of the learning. Students were tasked with conducting an evaluation of Web 2.0 tools which allowed students to create content, for example Prezi. They were presented with an evaluation rubric to complete which they then had to share and present to their group. Recall that groups were created in the previous lesson. They were then expected to give feedback on their presentations via the discussion board.

Lesson content and evaluation. As with the previous lesson, there was a quiz taken at the beginning of the lesson to formally assess students' understanding of the topic. A short debrief of the previous TPACK lesson plan assignment was conducted before students were divided into groups for the upcoming assignment on learning by collaboration. In this assignment, students were expected to find a different Web 2.0 tool from the previous lesson, and use the collaborative tool rubric to evaluate its functionality as an application to help students learn through collaboration. Next, as a team, they were to compare and evaluate their collection of tools and fill in a chart. This was to be conducted asynchronously using the discussion board. The instructional focus for the classroom was setting up and explaining how the task was completed. So unlike other classes, rather than have the students begin their assignment the instructor provided virtual reality (VR) headsets to introduce students to what VR might be able to do for future instruction. This was necessary as the assignment itself was for students to collaborate in their own time and discuss asynchronously using the discussion board. If they had been permitted to begin, collaboration would have occurred face to face, which would have defeated the purpose of the objective.

Module 4. Teacher tools. Students were expected to have viewed an instructor created video about instructional white boards, read a document with links to resources for different types of board (Promethean TM, or SMART TM), examined a TPACK Template for their assignment, along with a rubric to accompany the assignment in which they would research activities using interactive white boards. Part of this module was to learn about internet based tools which could help teachers, such as presentation tools like Prezi. This was only a part of the instructional focus for the lesson. The main objective was to make students familiar with how interactive white boards, such as Promethean, and Smart boards, are used to help teachers deliver content. Students were tasked with researching, then creating a presentation for use on an Interactive White Board. It was recommended that they download an evaluation version of the Promethean software, and create a short presentation making use of the manipulative features of the software. This was to be uploaded as an assignment, along with a TPACK plan, to Blackboard TM.

Lesson content and evaluation. Unlike previous week's opening activity, this week's task was a one question quiz, asking students to verify, on the honor code, if they had completed the collaborative assignment properly. Some students had been unable to meet, while others, worried about their grade, did the collaborative assignment on their own. Based on the results of the quiz, Linda decided that an extension was due so that students could meet online and conduct the assignment in the spirit it was written. Students were then tasked with working on the assignment for this week about interactive white boards. They were first tasked with identifying activities they might want to use in a TPACK plan. After the break, the instructor cleared up misconceptions about white boards, makes models and types, and then introduced a technology terminology quiz which would be due later in the semester. The aim of the quiz was for students

to submit technology terminology questions via the discussion board. These could be then used in the quiz. Linda explained that she was modelling student-created assessments by doing the quiz this way.

Module 5. Digital citizenship. As with previous modules, students were expected to have read or watched the multimodal resources prior to class. Along with the instructor created introductory video about digital citizenship, students were expected to examine a digital citizenship curriculum provided by Common Sense Media TM (2018). The ISTE (2018) guidelines on digital citizenship were also part of the readings. Student also read an article by Belch (2011) on the dark side of social networking. Along with the class readings, examples of infographics, and the rubric for the infographic assignment were also included for students to preview before class.

For this unit, students' readings reviewed the concept of "digital citizenship" and made them aware of the components of digital citizenship which include: internet safety, privacy and security, relationships and communications, cyberbullying and digital drama, digital footprint and reputation, self-image and identity, information literacy, and creative credit and copyright. For their assignment, students were expected to create an infographic about an aspect of digital citizenship.

Lesson content and evaluation. The quick opening quiz focused on reactions to the videos and multimodal readings. Linda had already provisioned for two breakout groups, one group who struggled with defining digital citizenship, and the other with understanding the nature of the assignment. Once misconceptions were addressed in each group, the second part of the lesson focused on digital citizenship as a topic. Students were tasked with using Kahoot TM, a Web 2.0 tool, to make decisions about various scenarios of improper and proper digital

citizenship. They were then asked to discuss why teachers are held to higher standards than other citizens. Case studies were shared about teachers who were disciplined for improper social networking posts which led directly into the explanation of the assignment for the week which was for students to create an infographic explaining digital citizenship to an audience of their choosing (students, teachers, or parents).

Module 6. Mobile learning. This module was front loaded with an instructor-created video providing a definition and short examples of mobile learning, what it was, and how it might be used. The video was supplemented by two articles, one about the benefits and challenges of mobile learning (Crompton, 2013), and the other providing an explanation about “Bring Your Own Device” and its implications. Both articles were practitioner-based, short in length, and easy to understand. As students were going to create a TPACK lesson plan using mobile learning in their content area, an assignment rubric and a blank TPACK lesson plan were also provided in this module to preview the task. The objective of the readings and videos in this unit focused on developing an understanding of what mobile learning is and how it might be leveraged in the classroom. As the newest technology in this class, it was likely that students would be unfamiliar and need clear and detailed explanations to be able to complete their assignment.

Lesson content and assessment. The digital quiz for this lesson was centered around the student’s understanding of the readings on mobile learning. From the results, several students struggled with the difference between transfer of learning and learning outside of the classroom. Because of their inexperience with pedagogy, students suggested an activity using mobile devices in the classroom, that transferred information from one place to another, were examples of mobile learning. Linda used direct instruction to correct those misconceptions.

While small group remediation took place to clear up the misconceptions, students were asked to sign in their attendance in class using the interactive white board. They were expected to correct misspelled names, move items around, and get a feel for how to interact with the board. Once this was completed, students could begin work on their mobile learning application review plan. For this assignment, they had to select any application for mobile instruction and demonstrate possible utilization in a TPACK plan. The last part of the class was a discussion, carried out face to face, about mobile learning, its benefits and challenges facing teachers. Interestingly, the instructor modelled how a discussion is often better conducted face to face than with an online discussion board. This served as an example of how sometimes the most appropriate use of technology is not to use it.

Module 7. Differentiation. For this module there were two videos and a reading which students were expected to complete before class. One video was about using mobile learning for digital equity, and the other video addressed issues arising out of labelling students by their disability. Both were third party videos, not created by the instructor. The reading consisted of a practitioner article about how instructional materials should be designed to be flexible, accessible, and usable for students with disabilities (Bowser & Zabala, 2012).

The objective of this module was for students in this unit to recognize that devices are capable of supporting differentiation in their future classrooms, with a focus on supporting the learning of students with special needs. Students were tasked with creating an instructional video that illustrated the accessibility features of a device, for example, how an iPad might support learners with disabilities. They were not expected to create a TPACK plan, or describe how the device might be used to teach content.

Lesson content and assessment. The quiz for this class concentrated on their understanding of the issues of equity and accessibility from the videos and the readings. The instructor was prepared to remediate on accessibility tools, but found she didn't need to. This was surprising as for most of the students it is the first time they have had to think about teaching students with disabilities. Linda led some direct instruction about the students with disabilities act, before allowing the students to work on this week's assignment.

The assignment for this week was different in that instead of creating a TPACK lesson plan, students were tasked with investigating how iPads might be used to assist students with disabilities. Although other devices might also be helpful, the directions stated that iPads were the most commonly used device in PK-12, so it was more likely that as teachers they would encounter them. The task itself involved creating a short video on any device, explaining how accessibility, internet, or other features of the iPad might help students with disabilities. Linda's purpose was to model how students can create online content, however, as I will explain in the next chapter, although participants completed the task, they approached it from a teacher's perspective.

Module 8. Teaching online. Prior to the class, students were encouraged to watch an instructional video, which for full disclosure I helped to create and narrate, about teaching online. What it is, what it isn't, and what sort of activities might occur. They had to read an online article about ten things learned about teaching online (Everson, 2009). The value of this article was the ability to see the comments made by other teachers at the end of it. They also read a second article about how to leverage online instruction to save time and money in their classrooms while increasing student engagement (Pape, Sheehan, & Worrell, 2012).

For this assignment, students were expected to select a simulation and write a TPACK lesson plan demonstrating how it might be included in their content, what standards it might complement, and how they might construct learning around it. Along with the readings was a table of free simulations for students to learn about and use in their TPACK lesson plan, the TPACK template for the assignment, and the rubric. This unit encouraged students to think about models of instruction that incorporate aspects of online instruction, flipped, and blended instruction. The uses of simulations were also addressed as a strategy to include in online and blended environments.

Lesson content and assessment. As with the other classes, the opening quiz focused on their understanding of concepts of online learning and simulations. Students did not need any remediation in this unit, consequently much of the class was devoted to the students researching for their assignment. This research was time consuming as it often involved testing out the simulations to see if they worked, what content they covered, and how long they took to use. Recall that students had to first find a simulation which complemented their content area, then write a TPACK plan about how they might deliver it in an online environment. For many this was a challenging assignment and the instructor was called upon to give a lot of pedagogical advice where necessary. This was another opportunity to model how flipped instruction involved the teacher role as facilitator to help students complete challenging assignments.

Module 9. Creating assessments. For this unit, students were expected to understand how Web 2.0 tools allow teachers to create and grade online assessments, rubrics, games, portfolios and flashcards. Using these tools, learners can self-assess, while teachers can craft authentic original assessments. Students in this unit were tasked to build an online quiz in a Web 2.0 environment. Prior to class, students were expected to view an instructor created video to

accompany this module and some practitioner articles. Students had to read about learning management systems and data driven decision-making (Kadel, 2010), an online article about formative assessment tools (Davis, 2015), another on web tools for assessment (Williams, 2013), as well as review an online repository of Web 2.0 applications.

Lesson content and assessment. As with all classes thus far, the lesson began with a quiz focused on the readings. However, Linda asked questions about how she collects real time reporting, thus testing whether they could connect the readings to her modelling of practice. Her second question asked whether students needed more help understanding what a Web 2.0 assessment is. These questions were deeper than normal and looked to reveal if the students were making connections between what they were reading and what was being modeled.

After the quiz, Linda noticed how most of the class struggled to connect the readings to her modelling of practice, so she took time to demonstrate further how she uses google forms to create the quiz, and google sheets to collate the quiz data. Projecting her iPad, she demonstrated how that data is accessible in real time and it useable for immediate feedback and remediation, as in this instance. Following this, she instructed further about how other Web 2.0 applications can be used to help with assessment. Then, following a break, students were tasked to work on their assignment. For this assignment, students were expected to create a five-question quiz using an online quiz tool. They were given a choice of Kahoot™ or Socrative™. Once the quiz was completed, they had to copy the link into a word document along with the standard or standards it aligned to and post it on the discussion board for peer review.

Module 10. Analyzing assessments. As I shall discuss in Chapters Four and Five, this module was probably the most controversial from an instruction and course design perspective. In this module, students were tasked with creating a spreadsheet in Excel, then performing

guided data analysis, after which they had to write a series of recommendations for instructors based on the data. The objective was to simulate how teachers would create and use data to make data driven decisions about their classes and future instruction. As students would be teaching in a variety of school systems, using different gradebooks and data management systems, Linda felt that using Excel gave everyone a grounding in the basic concepts of data management. With that in mind, there were no readings for this week. Instead, students were expected to watch three instructional videos explaining what Excel is, how to make spreadsheets in Excel, and how to manipulate data within the tool.

Lesson content and assessment. The opening quiz asked about the benefits of using Excel to deal with data. Many students responded with confidence so Linda was happy to skip remediation and allow the students to go straight into the assignment. For this unit there was a handout in Blackboard™ which contained the imaginary test results for a math class. The students were tasked with finding the percent average for each student, the percent average for the class, and the percent average for each question. They then had to find averages for certain topics, work out how many students gained which grade, then create a bar chart to show the averages. Once this was completed, they had to find the mean, median, and mode for the group, then, most importantly, write an evaluation of the class based upon data collected. They were also expected to identify from the data which students might need extra help and what that help might be.

Module 11. Teacher communications. The readings and videos in this unit emphasized the variety of ways technology could help teachers and schools connect with parents. For this unit students were to create and add a QR code to their digital citizenship infographic (from Module 5). In this example, the QR code would be the tool by which teachers could

communicate with parents. Along with an introductory video created by the instructor, before the class the students were expected to read an online article giving advice to teachers about communicating with parents, and explaining how applications like Remind101 might be useful for frequent updates (Stern, 2012). Students were also expected to read a practitioner article about QR codes, with reference to how they can aid communication (Crompton, LaFrance, & van't Hooft, 2012). Instructions for the QR code assignment were also available for reading before the class.

Lesson content and assessment. The opening quiz focused on the students' ability to apply the reading to their future practice by naming two ways they might use QR codes in their class. Once the test was completed, students were introduced to a practical use of the QR codes by participating in a QR code scavenger hunt around the campus. Prior to class, Linda posted QR codes at various points of interest. Students were tasked with answering questions on a sheet, the answers gained by scanning QR codes at each location. As students scanned the codes, information pertaining to the scavenger hunt (which really served as an online campus tour) could be accessed.

Once the campus tour was completed, students worked on their QR code assignment. In this task, they were expected to create a QR code with their basic contact information on it, as if they were creating it for parents, and add it to their digital citizenship infographic which they created previously. To gain credit, they uploaded the infographic, along with a QR code, and a brief description of what it contained, to the drop box in Blackboard.

Module 12. Digital portfolio. The aim of this unit was to teach students how to recognize methods in which they could create a positive web presence. For assessment, they were to create a digital portfolio of their work, using a Web 2.0 website creation tool. This

assignment replaced the use of a LiveText™ digital portfolio in previous class iterations. As with other modules, students were required to access information before the class meeting. In this instance they were tasked with examining two websites designed to assist in the creation of online portfolios. One introduced them to a plethora of Web 2.0 tools such as Evernote™, Google Sites™, Voicethread™ and Weebly™ to create digital online content that might reflect their learning. The other website, Teacher Tap.com, contained examples of online classrooms or digital portfolios of work created by teachers and students alike. As with other units, students could watch an instructor-created introductory video, and they had access to assignment instructions, a checklist, and a rubric.

Lesson content and assessment. As with the other lessons, this one began with an online quiz. Students were expected to describe the best features of some of the websites they encountered on the teacher tap website. Next, students were instructed to make sure that any outstanding tasks were completed, so that they could be included in the online portfolio. After which, the online portfolio directions were reviewed and students began their work.

The online portfolio was to be built using Weebly™ for convenience. It was to include a Home Page, an example of learning by creating or collaborating, an example of work showing teacher tools and differentiation, a section on digital citizenship and communication, and a section showcasing the assessments students created. For credit, the website had to be published with examples and descriptions of their work in each section. Additionally, students were expected to write a reflection about how their knowledge of Educational Technology has grown over the course. This assignment provided a capstone experience in which students had to summarize and evaluate their learning. Linda explained to the class that the website they create

could become a living document they could share with prospective employers, school principals, and administrators to showcase their learning of teaching with technology.

The Participants

Now that I have provide an overview of the class instructor, her rationale for teaching and designing it, and how each lesson was enacted, I will briefly describe the student body of the class, and the participants who volunteered to participate in this study. The class itself consisted of 23 students, of which five were secondary social studies students. Although there were two other students who wanted to join the study, one was considering elementary education, even though he considered himself a social studies specialist and was expecting to major in history. The other wanted to teach secondary, but was yet undecided in his major and could not decide whether he wanted to teach social studies or English. He was adamant that he did not want to teach middle school, where he could be endorsed in both. As a result, I declined their offers of participation.

Of the five who were identified as secondary social studies students, all agreed to participate in the study. All five participants were white males. Four were under 30 years of age, one was over 30. For this dissertation, and to protect the anonymity of the participants, all are referred to by pseudonyms. The contextual information reported here mainly comes from their demographic responses to the first survey, and the first interviews conducted in the first week of the class. Table 4.1 (below) shows the demographic results of the survey.

Participant 1, John. John was in his mid-20s when the course began. He was a quiet student who identified himself as gifted when in elementary school. John was a product of a local school system and spent much of his early years education in the district's designated gifted school. As a result, he was consistently placed in academically rigorous courses. John described

Table 4.2

Participant Bio Responses to TPACK Survey

Participant	1	2	3	4	5
Pseudonym	John	Paul	George	Richard	Pete
Please specify your gender.	Male	Male	Male	Male	Male
What is your current age?	23-26	18-22	18-22	18-22	27-32
What is your current year of study?	Junior	Senior	Junior	Senior	Senior
What is your area of specialization?	History, English	History	History	History	Geography, History, Government, Poli-sci
Describe a specific episode where an ODU 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 approaches) was implemented.	This is my first class...but in the past professors have utilized PowerPoint and online discussion boards to encourage students to think and share with one another. I have also been in many work groups that required the use of Facetime and Gmail to complete the project.	When I took TLED 301, my professor had us use a website to answer questions she had listed. The class had to log onto the website and it tallied our answers showing on the board in the form of a bar graph, how the students answered.	I have not seen a professor do this except a TLED teacher	N/A I am taking my 1st Ed. courses.	In a first aid class. Teacher used a new type of CPR dummy that Bluetooth connected to your mobile device and gave you clear readings of oxygen intake and even survival rate. Helped with assessing heart attack vs other medical emergencies.
Describe a specific episode where one of your K-12 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.	Instructional Technology PK-12 uses the flipped classroom method to provide students with lectures and readings online from home so classroom time can be dedicated to projects. This is an example of how a professor can structure their classroom differently because of technology.	When I was in high school, smart birds were at our use, so teachers made power points and lectured from presentations on the boards which could be written on and used to access the Internet and even TV channels.	One of my TLED professors used technology in the classroom to get the class to create a wiki book lesson. I did my lesson on W.E.B Dubois. We had to implement a Web 2.0 tool into our wiki book lesson.	N/A	I am 31 years old. The greatest extent of technology used in my K-12 school years was projectors from a computer and DVD players.
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.	As a substitute teacher I use technology frequently. I recently taught a lesson on the Harlem Renaissance in which I used PowerPoint and encouraged the students to use YouTube to find a jazz song from the time.	I have not used technology in a classroom lecture before.	Have not had the opportunity yet to create a classroom lesson in a real setting.	N/A have yet to teach in a classroom setting.	As a coach I have used a multitude of technology. The best was a 4-camera setup in a football practice field that allowed instant review of a player's actions and play to correct on the spot any misunderstandings or deficiencies.

himself as a good K-12 student, he always achieved high grades and made honor roll or principal's list. He did not mind doing mundane activities such as worksheets or note-taking as he knew he would earn a good grade.

His earliest social studies memories were from elementary school when he did worksheets and flashcards, and he saw himself as good with such tasks. John particularly enjoyed connecting with history when on field trips and found that he most enjoyed social studies lessons when taught by enthusiastic teachers. When he was in advanced placement courses at high school, he felt that his teachers could take risks with instruction. He noticed how his social studies teachers were fully engaged in the content and immersed themselves in the narrative. As a result, he remarked how these teachers could tell historical stories in more depth, which was something he appreciated. As far as technology infused instruction was concerned, John's experience in school was often one where his teachers lectured using PowerPoints, while he made notes, wrote papers, and took quizzes. As he earned good grades, he felt that he was strong at history and understood it. His college experiences confirmed his belief in his own historical abilities. He enjoyed the process of listening to engaging lectures, taking notes, writing papers, and excelling at tests.

As a teacher candidate, John felt he was well-prepared in content and open-minded enough to learn technology so that he could deliver content to his students. He could see the potential for students to use smartphones to find answers to questions, and was interested to see how that would affect history teaching. In his words, "I want to go beyond textbooks...use YouTube and multimedia" (Interview 1). This implies that John, although reliant on his K-12 school experiences, could see the need to embrace modern technologies to keep students interested in the subject.

John saw himself as a future middle school teacher. As such, he recalled his own middle school experiences where teachers used games, group activities, and field trips to keep students interested. As someone who had substitute taught, he realized that student engagement was essential, and saw technology as perhaps a way to do this. While working as a substitute he experienced teachers who were resistant to change, and who did not want to use technology, noting that “they are already defeated by it” (Interview 1). He was hopeful that participation in the course would help him to use technology in ways that his students might enjoy it. He hoped that good technology integration might develop “better attitudes to learning” from his students.

Participant 2. Paul. Paul was one of the younger students, who had just turned 21 at the time of the course. Paul came from a low socio-economic background and was raised by his single parent father, who was in the military. Because his father received new duty orders every few years, Paul lived in several places, although he did not get to live abroad. Paul has a self-confessed love of history which stemmed from his father who Paul claims, is a patriotic, American history buff. Paul described his father as a role model, and his admiration of his father is an influence on him. For example, when he was young, his father would take him to battlefields and tell him stories about military history which Paul found most interesting. As a result, Paul is obsessed with visiting battlefields and learning about United States military history.

Paul identified himself as someone who was not a good student. He admitted to sleeping in class and “goofing off” in elementary school. He particularly disliked group activities because he did not trust other students to do their part. Most of his experiences at high school and college were with teachers giving PowerPoint presentations and students completing fill-in-the-blank notes and worksheets. He was generally achieved good grades at history, and understood the

content. Consequently, it was the only subject he felt he was good at history, he tolerated school because he liked history, and he wanted his future students to love the subject as much as he did.

Paul expressed in his initial interview how if he was going to oversee a classroom, then he liked to feel like he was the expert in the room. This is a problem regarding technology. He did not see himself at any level of expertise with technology, in fact he described himself as a “hater of technology” (Interview 1). He had little or no confidence with technology tools, whether it be laptops or smartphones. Some of this is due to his upbringing. As a student with a single parent, and of generally low socio-economic status, technology tools such as personal computers and cellphones were considered as a luxury. Indeed, during the class it was revealed that Paul’s laptop, which was purchase reconditioned, had broken and he had to use computers in the library and other locations to complete coursework. He also considered himself unlucky with technology, devices were unreliable and expensive, and he felt he could get by well enough without them. As a result, he did not see himself using much technology when he taught. Instead, he wanted to form good relationships with his students, and be the teacher with the deep level of knowledge that other teachers did not have. He did, however, see technology as a way of bridging the cultural divide between teacher and student. He was amazed at how kids could create content, and so wanted to learn more about pop culture so that he could stay relevant. However, he insisted he would be a “pencil and paper type of teacher” (Interview 1).

Participant 3. George. George was the youngest and quietest of the participants. He was from a small town in another state. His earliest experiences of school were his elementary days where the focus was on reading and math. He did not recall doing any history or social studies at that level. In middle school he enjoyed work involving reading maps or making baseball cards about famous people they learned for tests. He had one middle school teacher who

was enthusiastic about history and made his lectures interesting with good stories. George learned to write papers in this teacher's class and realized he was good at social studies as a result.

George claimed to be a strong in his content knowledge, but also developing in his technological knowledge. He experienced using a learning management system at high school, Moodle™ for content delivery. He remembers spending time creating timelines and participating in discussions on blogs. As a result, he felt that he had a fair amount of technology experience at school, but still needed to learn more.

When thinking about his future teaching, he could see himself using technology to help with review, having students playing games or making timelines, just as he experienced, but he could not yet see how to substantively use technology in his teaching. He noted,

So far, I haven't really found the space for technology integration. I feel that it is being forced into the subject. Technology is not a priority in my decision-making...as a student I enjoyed lecture...I think that activities can be potentially more exciting than they are.

(Interview 1)

As with the other participants, George felt he was a strong historian as he earned high grades at school and in his college coursework so far. As he viewed himself as a successful student who learned without technology, he could not envision any new ways for technology to change that paradigm.

Participant 4. Richard. Richard was the second oldest of the participants, but still in his early 20s. A self-confessed history nerd who enjoyed history as a child and was felt that history was his strongest subject. As with his colleagues he always earned high grades in the subject, and enjoyed his college coursework. He recalled being in elementary school and doing lots of group

work, which, unlike Paul, he enjoyed immensely. His middle school experiences were less interesting in that he mostly completed worksheets while in high school he was afforded greater opportunity to work in groups and participate in research projects. He explained how we wanted to be like his favorite history teachers because they “made it interesting and they were passionate about it” (Interview 1). He noted how they cared about the content, so content importance was important to him also.

As far as his experiences with technology went, he recalled how he used laptops in middle school, but they were mainly to access websites to help with research and information. A product of a local school system, his high school had Promethean interactive white boards in every classroom which were occasionally used to play Jeopardy-style review games. As a student he expressed how he learned best when his teachers told interesting stories in lectures, as and sees himself and his approach to teaching social studies as “old fashioned at heart” (Interview 1), meaning he wanted to replicate what he saw as traditional teaching, using lectures to convey content to students. He claimed he owned a smartphone, but did not use apps or social media much.

Richard identified content knowledge as his strength, “I’m a nerd at heart, teaching can be a hobby...I like history so with enough experience I will teach well” (Interview 1). His view was that if he would know enough content, he could convey it with ease. The longer he taught, the easier it would get, he believed. In terms of teaching with technology, he saw technology as more a “headache than a help...I can see how it is useful to the learner, but for a teacher, I think I would use SafeAssign™ all the time” (Interview 1). For Richard, technology would be used to assist him in ensuring students would not plagiarize. He envisioned using online photos to help him teach content to students, and technology tools could provide the audio-visual effects to

enhance his lectures. He understood that it was possible to go beyond lecture and be student centered, but he was not sure how to do this.

Participant 5. Pete. Pete was the oldest of the participants, in his early 30s at the time of the class. He was also by far the most outspoken. His experience of the “No Child Left Behind era” came through an adult’s perspective (Interview 1). He recalled going to school before NCLB, which made him admittedly different to other participants and members of the class. His recollections of elementary school involved having a teacher who would dress up in costume, whereas in middle school his teachers regularly used worksheets and the students took tests. He felt that he learned most when on field trips, as it took his learning outside of a textbook. He described how authentic, he used the words “real world” (Interview 1), experiences were important to his success at the subject. Pete claimed that did not like learning in high school because it involved a constant cycle of read, listen to a lecture, take notes, do a test. “I didn’t learn well this way” (Interview 1). This implies that Pete was successful in the classes where this cycle did not occur. Pete was impressed with the level of interactivity he was exposed to in his college classes. He described taking an online tour, playing games, and doing projects. He expressed how he appreciated the chance to interact in groups in college classes. “That helps me to learn” (Interview 1).

In terms of technology use, Pete saw himself as a “high-end user” (Interview 1). He explained how he liked to use the latest tools and gadgets, working out what they can do. He was involved in the university radio station and this exposed him to technologies he would otherwise not get to use. It was his desire to be at the cutting edge of the latest technology as much as possible. He saw benefits from using technology and expressed how he would like to engage students with tools like anonymous polling to gauge their opinion. Because he felt that he learned

better when engaged in group activities and discussion, Pete also saw the potential to use blogs and discussion boards as a forum to promote discourse. He also stated that “social media is important for news articles and knowledge. It is important for kids to see the difference between real and fake news” (Interview 1). Unlike the other participants, he could see a value in the media students use every day, and even pointed out the skills necessary to navigate these tools.

As far as his future directions were concerned, Pete’s interest was in cultural geography. He wanted his students to see how cultures interconnect, and as such, he felt technology could play a role. He saw participation in the class as an opportunity to deepen his understanding so he could get a better idea about how to meet his aims. In this way, Pete was already stating a vision for how his classes might be taught in the future. As I explain the findings in the next chapter, and discuss their implications, we shall see Pete develop his vision even further.

Chapter Summary

In this chapter I described the geographic and temporal setting for the case study, the class under investigation, the instructor, her rationale, and the five participants involved in the study. To summarize, this case study was set in an instructional technology class, taught face to face in a large, urban, research university. The class itself was a new iteration of an existing educational technology class. The instructional focus changed from a concentration on technology tools, to the use of technology in different instructional contexts. It was delivered in 12 modules, face to face, but utilized a flipped model of instruction. It was the instructor’s intent to model pedagogical practices, such as formative assessment, small group instruction, and student-centered instruction. The five participants, all white, male, secondary social studies teacher candidates each had a different understanding of what constituted good social studies instruction, as well as varied experiences of how technology could be used to enhance social

studies teaching and learning. These experiences and opinions were largely shaped by their K-12 experiences.

How the participants' understanding of TPACK in social studies was shaped by their participation in the class will be explained in the next chapter. The findings will be presented in relation to TPACK, particularly technological, content, and pedagogical knowledge. Aspects of the class that were an influence on participants' pedagogical stances will also be highlighted. Furthermore, shifts in the participants' dispositions, as well as descriptions of their evolving rationales will also be reported. These findings will be further discussed in Chapter Six. I will focus on issues pertaining to the learning of educational technology by teacher candidates, the learning of social studies teacher candidates, the placement of educational technology coursework in an education program, and I will discuss how participants developed an understanding of TPACK in this context will be discussed. Furthermore, I will also address the extent to which this Educational Technology class served to shape the dispositions of the participants, and the importance of their rationale development. Lastly, avenues for further research pertaining to this study will be briefly discussed, as will the significance of current and future research in this field.

CHAPTER 5

Findings

In the first two chapters, I described how teacher education was a complex act which is often perceived to be simplistic and self-evident, particularly among teacher candidates whose K-12 experience frames their beliefs and defines how they will enact pedagogy. I described how teacher education scholars argue for the need to develop teacher candidates' vision and rationale for teaching to challenge misconceptions and predispositions forged through a 12-year apprenticeship of observation (Lortie, 2002). This is also true for social studies education when teacher candidates are tasked with integration of technology into their instruction. The consensus among social studies researchers is that content methods classes are the best space in which teacher educators can reshape teacher candidate beliefs (e.g. Bolick, Berson, Friedman, & Porfeli, 2007; Byker, 2014; Kerr, Schmeichel, & Janis, 2015). Following that argument, it can be assumed that social studies methods classes are also the spaces in which technology integration can best be learned. However, little research exists that investigates how social studies teacher candidates develop an understanding of TPACK, and in what spaces. This study, therefore, sought to deepen understanding of how social studies teacher candidates learn TPACK, how their beliefs are challenged, and the role that a standalone technology class plays in their learning, by asking the following research question: How does participation in an educational technology class help address issues of teacher candidates' prior beliefs, preconceptions, and dispositions toward technological, pedagogical, and content knowledge (TPACK)?

In Chapter Two I unpacked the learning about teacher education and provided a research context for this study. Furthermore, I defined the concepts of teacher candidate's beliefs, dispositions, and preconceptions. The need to develop rationales or personal visions in teacher

candidates was explained, as was research into models and frameworks for teacher education. I also examined issues surrounding social studies education and how technology integration is both learned and implemented. I also revisited models for teacher education, with TPACK posited as the framework of choice for teacher educators as it builds upon Schulman's PCK model with the additional, and vital, technology component.

How to investigate the learning of TPACK provided the focus for Chapter Three. In this chapter I explained the reasons for choosing a case study methodology. I explained how I used both a constant comparative analysis as well as chronological sequencing, in which the findings were re-evaluated alongside the events of the class. From this process, four key findings were established that helped to answer the research questions. These findings are: (1) Evolving understanding of TPACK; (2) developing rationale and vision; (3) influencing pedagogical decision-making; and (4) challenging predispositions. The key findings noted above are described within the context elaborated upon in Chapter Four. It should be noted that along with the four key findings, other issues concerning the placement of the class in the overall course program as well as issues of prerequisite learning of teacher candidates also arose from the data. These are issues that merit further discussion arising from the research question and therefore will be addressed in Chapter Six of this study.

As the research question focuses upon the learning of TPACK, the most important finding is how the participants' understanding of the main domains of TPACK (Technological, Pedagogical, and Content knowledge) were influenced by their participation in the course. As I explained in Chapter Four, each of the participants had differing preconceptions about social studies teaching with technology, and were therefore influenced in different ways. As I present this first finding, I will discuss each domain from the perspective of each of the participants. I

will then examine the finding as it related to the chronological sequencing process to create an overall summary of how the course content contributed to their understanding of TPACK. This will provide a foundation for me to examine the next three findings from a more general perspective. This will avoid overlap and repetition where possible. So, it is to the first finding, relating to participant's evolving understanding of TPACK that I will now focus.

Evolving Understanding of TPACK

Participants were exposed to different aspects of TPACK throughout the class. Their understanding in all three areas (pedagogical knowledge, technological knowledge, and content knowledge) evolved through course participation. By completing instructional plans framed through TPACK, participants considered how they might enact their learning of technology integration in future social studies instruction. As I explained in Chapter Three, participants were questioned on aspects of TPACK through a survey instrument at the beginning of the class. See Appendix 3 at the end of this dissertation for examples. Through this survey, participants could self-assess their competency in each of the components of TPACK. Using this information as a foundation for discussion, it was possible to describe each participant's development in each domain. To help provide context for how the surveys were used to prompt discussion, I include tables outlining each participants' response to the appropriate section of the TPACK survey. Although many of the responses are similar, from the interview data, I could further ascertain subtle differences in each candidate's developing understand of TPACK and their evolving dispositions. This illustrates the value of using semi-structured interviews to gain deeper insight about the participants' class experiences influenced their understanding. Therefore, I will begin the findings with an examination of how participation in the class influenced their understanding of how they teach.

Pedagogical knowledge.

Table 5.1

TPACK responses – Pedagogical Knowledge

Survey Number	One	Two	One	Two	One	Two	One	Two	One	Two
Pseudonym	John	John	Paul	Paul	George	George	Richard	Richard	Pete	Pete
I know how to assess student performance in a classroom	Agree	Agree	Neither Agree or Disagree	Mostly Agree	Disagree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
I can adapt my teaching based-upon what students currently understand or do not understand	Agree	Strongly Agree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
I can adapt my teaching style to different learners	Agree	Agree	Agree	Agree	Neither Agree nor Disagree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
I can assess student learning in multiple ways	Agree	Agree	Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Agree	Agree	Agree	Strongly Agree	Strongly Agree
I can use a wide range of teaching approaches in a classroom setting	Agree	Strongly Agree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Agree	Agree	Strongly Agree	Strongly Agree
I am familiar with common student understandings and misconceptions	Agree	Agree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Strongly Agree	Strongly Agree	Agree	Agree
I know how to organize and maintain classroom management	Agree	Agree	Agree	Agree	Neither Agree or Disagree	Neither Agree or Disagree	Agree	Agree	Agree	Agree

John. Unlike the other participants, whose experiences of teaching social studies were limited to their apprenticeship of observation, John felt he was in a better position to learn about TPACK than his colleagues because he had experience as a substitute teacher: “I feel confident in front of a class” (Interview 1). He stated in his initial interview how his perception of what

teaching should be changed because of his classroom experiences as a substitute. Seeing how instruction occurred from the teachers' perspective, even if he was not involved in the planning process, helped him to gain a different perspective than that gained from his K-12 experiences. Although he was not able to craft instruction in this role, he described an affinity for students who were bored by worksheets. His understanding of social studies instruction was still predicated on acquiring foundational knowledge, but he expressed that he wanted "to go beyond the textbook, and the information gathering" (Interview 1). He felt that the curriculum as it stood could be taught with "flash cards or something...it's dates and events" (Interview 1).

As he participated in the course further, his understanding of pedagogy evolved: "...if you can teach them how to learn on their own or how to research, for example, then even when they are out of your class, they can contribute to their own research" (Interview 2). For John, his understanding of what social studies pedagogy was changed from content delivery to students, to teaching them how to conduct research. He attributed this shift to having to learn through the flipped model of instruction in the class. It helped him realize his instructor was "more of a guide, less of a lecturer" (Interview 2), and therefore he should aim to replicate that practice. John liked how as a student in the class, he was now responsible for his learning. He described how he might use games to "trick a child into learning" (Interview 2). This example of pedagogy is removed from his initial interpretation of his role.

Effectively, John's understanding of pedagogy began to evolve from a teacher-centered model, where the teacher is disseminator of information and students demonstrate understanding through worksheets, to one where the teacher is a facilitator of instruction, who is there to guide students in their learning, and even uses games to give them experiences. However, the

implication is that John was not convinced this was good practice, as he described using games for experiential learning as tricking students into learning the foundational knowledge they need.

Paul. As I explained in the previous chapter, Paul was not always the best student of history, but he loved the content. In his initial interview he felt he did not have much pedagogical knowledge, rating himself low on the TPACK survey. When asked why he rated himself so low, he explained that he had never had to think about planning, “TPACK plans started me off” (Interview 1). He explained how he saw himself teaching in a traditional manner, using his love of content and enthusiasm to spark interest in his students, much like he experienced with his own teachers. He stated, “Before this class I was honestly just thinking I was going to be a pencil and paper type teacher, where actually what I wanted to do to spark a kid’s imagination, rather than do games and interactive activities” (Interview 1). Even at this early stage of the class, Paul realized there might be a different pedagogical approach to what he envisioned. He acknowledged how the TPACK plans made him think about his teaching as he considered the validity of practices using games and interactive activities.

Paul’s understanding of pedagogy evolved as the class progressed. When we revisited the survey, he shifted his self-assessed score on the pedagogical understanding to more “agree” statements than “disagree” statements. For example, “I can assess students in multiple ways, so that was a disagree, now it’s an agree. I can use a range of teaching approaches in a classroom setting, that’s an agree”. He gave examples to support his evolving position, citing using games to help students learn and creating infographics to convey information.

Although his understanding of pedagogy was expanded, he still considered teaching as a knowledge delivery transaction, where he would be the center of knowledge and understanding,

while his students would learn from him. We will see how Paul's teacher centered pedagogy is re-enforced in his developing understanding of the other areas of the TPACK framework.

George. As we discovered in Chapter Four, George had traditional experiences as a student and as a result he saw himself teaching in a similar style. In his initial interview based on the TPACK survey, George agreed with statements about his ability to understand content knowledge and pedagogical knowledge. Although he was not confident with technological knowledge. When questioned he felt that he did not need to be. He already had an idea about how teaching should be: "My model of teaching...it doesn't have to be a long lecture, but lecture, class discussion, and just a quick recap. That's my ideal classroom" (Interview 1).

By his later interviews, George's position had not changed. His self-assessment of his pedagogy remained the same. He described how he saw the role of teachers as:

...trying to give as much content as possible, which I know you pretty much get content from anywhere now, but being able to convey that content in a way that people can easily understand and interpret it for themselves would probably be beneficial (Interview 3).

Although George still advocated for a teacher-centered pedagogy, there was some demonstration of a small pedagogical shift. Whereas he began the class advocating for the use of lecture as the way for teachers to convey information, George now advocated for other undefined means that would be easier for students to understand. For George, his shift was to think about activities or tools that could "break up lectures and stuff, but I still haven't found something that's going to revolutionize instruction" (Interview 2). Throughout the class, George worried about teaching around standards. He described his struggle as "designing lessons around the content...then I will see if I can supplement that content with resource activities" (Interview 3). So, for George,

pedagogy involved content delivery, usually through lecture, but broken up by other activities he could not identify to keep things interesting.

Richard. Like George, Richard agreed with most statements on the survey which reflected his content and pedagogical knowledge, and he rated himself as low on the survey, about technological knowledge. In his interviews, it was difficult to get him to commit to an idea of how he saw himself teaching. As with the other participants, Richard saw himself as a good student of history, and his success at learning through a traditional, teacher-centered, lecture model influenced his thinking throughout his participation in the class.

That said, by the time of his second interview, there were shifts in how he saw technology use and how that influenced his content knowledge of social studies. However, he did not express a shift in approach in his pedagogical outlook. The strongest example of this is in his description of assessment practices. When asked about how he might assess student work, he stated: “When I envision assignments, they are more book based, even when technology is involved, they’re more old-fashioned” (Interview 2). His pedagogical knowledge barely evolved through course participation, yet by using the words “old-fashioned” he admitted that his approach might be out of date. As we shall see from Richard’s attitude to technology and social studies content, he did undergo some evolution, but at this stage in his development as a teacher candidate, he was not aware of a shift in his pedagogical stance.

Pete. Of all the participants in this study, Pete had the most to say about his understanding of aspects of TPACK. As I demonstrated in Chapter Four, Pete was already an advocate for technology, and although he indicated that he was comfortable with his level of pedagogical knowledge, his initial interviews did not reveal how he might approach his teaching. Pete had the ability to critique his college professors and his school experiences, stating:

I wish that teaching styles that are around today, especially at the college level, had been around or taught at least to teachers when I was a kid, because I think we probably would be leaps and bounds ahead of where we are. (Interview 1)

This indicates how he recognized the benefit of a strong pedagogical approach, and could see it in his current professors. Pete often wondered how he might have benefitted from more progressive approaches in his education. As a mature student, Pete wondered if he might have been more successful in his younger years had his K-12 teachers been as progressive then as his professors are now. Pete expressed a motivation to bring progressive practices, modelled by his professors, to his own classroom.

Pete was an advocate of using discussion to help with student understanding. When describing a potential approach to teaching in the content, Pete described how he would start with wanting students to read something small, “Then I would want students to discuss whether they agreed or disagreed with what it is we are doing” (Interview 1). Pete was confident that his students would be able to discuss content. However, as the course progressed, Pete acknowledged how his participation made him reconsider his pedagogy, specifically in how he might relay content knowledge. With that thinking came self-doubt: “How am I going to set up a lesson plan to teach kids what I just learned in a way that kids could understand because I’m an adult, I can barely just understand what I just learned now” (Interview 2). Nevertheless, exposure to the flipped model of instruction pushed him to consider his role in the classroom:

You must open up as a teacher in the flipped classroom more than you do in a traditional classroom...I’d emphasize the collaboration part...if a student knows something well there’s no reason why that student shouldn’t be allowed to share that information.
(Interview 3)

This shows how Pete could re-conceptualize the role of teacher from one of sole expert, to one who allows students to share knowledge. This shift was in part influenced by his exposure to the flipped model of instruction.

Summary. In pedagogical knowledge, participants' responses were consistent. They generally felt they were not strong in pedagogical knowledge but as their class participation progressed, participants indicated a greater awareness of their pedagogical limitations, expressing a small amount of growth when they self-assessed using the TPACK survey.

From the chronological sequencing, it was evident how certain assignments aided the participants in their understanding of pedagogical knowledge. For example, modules nine and 10 involved the participants building an online quiz and then analyzing the data using Excel. Although they did not have to create a TPACK plan for either of these assignments, the participants had to consider assessment practices, as well as the disaggregation of performance data, and then recommend what teachers should do because of the data. Indeed, Richard felt that learning to use tools like Excel were beneficial to his teaching because it would help him with his decision-making. In the instructor's lesson plans, an overt decision was made to model assessment strategies throughout the course, especially formative assessment strategies. However, assessment was only mentioned in the multimodal texts in one unit, and it was unclear whether this was enough to have any positive impact on the participants. Other than sharing their feelings that working with Excel was a good idea, they did not mention assessment at any other time in the interviews. The Excel assignment exposed students to assessment practices, however, as the class did not delve into issues around balanced assessment and the use of formative and summative strategies, and the participants provided little evidence of consideration of such

matters, I can infer that this activity did not overtly influence potential pedagogical practice or improve pedagogical knowledge.

Similarly, the scaffolding of assignments and learning activities was evident throughout the class. The design of each module began with information acquisition from the multimodal texts. The information was formatively assessed and remediated if necessary at the beginning of class. The process by which students created their products was also broken down into a checklist. Rubrics were published for every activity, ensuring transparency. For the instructor, modelling of practice and scaffolding the learning was of paramount importance. However, the participants did not pick up on it as factor in their learning or future pedagogy.

Nevertheless, when questioned about their future practice in interviews, participants acknowledged the flipped model of instruction was a new experience for them. Some participants experienced tensions as they learned to work in this different environment. Richard expressed how he enjoyed learning via the flipped classroom model, but he did not express a desire to use it in his instruction nor could he make a connection between how it was modelled and how he might use it. Pete, though, was a fan of the model. Similarly, George enjoyed learning through projects, although in his conversations he was unable to connect the modelling of pedagogy by the instructor to his own potential practice.

The use of the TPACK planning tool was beneficial to the participant's consideration of social studies teaching because they had to connect how to deliver standards based social studies curriculum to a TPACK concept they learned in the class. John described how the TPACK plan made him think about curriculum for the first time and how this leads him to enact instruction differently to the teachers whom he substituted for. John also expressed a keenness for using

games to help students learn content. He liked learning with jeopardy quiz games and was interested in finding opportunities to include these in his own teaching.

Pete, on the other hand, felt the class served as an introduction to pedagogy. For him, participation in the class improved his pedagogical knowledge. He was particularly impressed at how the instructor modeled pedagogy. He realized the class was not just about finding opportunities to integrate technology tools, and he appreciated the chance to see how meaningful integration could be done. Indeed, Pete summed up his understanding of the pedagogical purposes of the course in his last interview: “I think it comes down to let’s teach teachers how [to teach].” Fundamentally, his understanding of pedagogy was improved because he understood the class provided a focus on how to teach with technology, as opposed to what technologies might be useful to help a teacher. With that said, although Pete now believed he was better at understanding how to teach, the general nature of the class did not afford him the opportunity to evidence this in a social studies context. His plans were still reflective of a teacher centered, content delivery model, albeit with more collaboration and group discussion.

Technological Knowledge. As outlined by the class instructor in the teaching materials, the emphasis on the class was to teach technology for student engagement, and to promote accessibility and equality. By shifting emphasis onto the concept of accessibility, equality, and engagement, the class instructor aimed for the participants to develop a conceptual understanding of technology integration. To be successful in this area, participants had to not only be able to use and integrate a technology tool in content delivery, but also rationalize why making such technological choices was a good idea. By completing TPACK instructional plans, class participants were forced to adopt a more nuanced approach to instruction than they might otherwise consider. As with pedagogical knowledge, I will give some brief examples of how

each participant discussed their developing understanding of technological knowledge, before discussing their experiences more generally.

Table 5.2

TPACK Survey Responses – Technological Knowledge

Survey Number	One	Two	One	Two	One	Two	One	Two	One	Two
Pseudonym	John	John	Paul	Paul	George	George	Richard	Richard	Pete	Pete
I know how to solve my own technical problems	Agree	Agree	Disagree	Mostly Disagree	Neither Agree or Disagree	Agree	Neither Agree or Disagree	Neither Agree or Disagree	Strongly Agree	Strongly Agree
I can learn technology easily	Agree	Mostly Agree	Disagree	Neither Agree or Disagree	Disagree	Agree	Agree	Agree	Strongly Agree	Strongly Agree
I keep up with important new technologies	Agree	Agree	Strongly Disagree	Disagree	Disagree	Agree	Agree	Agree	Strongly Agree	Strongly Agree
I frequently play around with technology	Agree	Agree	Disagree	Disagree	Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Strongly Agree	Strongly Agree
I know a lot of different technologies	Agree	Agree	Disagree	Disagree	Disagree	Agree	Agree	Agree	Strongly Agree	Strongly Agree
I have the technical skills I need to use technologies	Agree	Agree	Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

John. John viewed himself as comfortable with technology. In his surveys he answered “agree” to most questions on technological knowledge. Indeed, in his initial interview, he stated how,

I don’t see it as a burden to learn something new or to learn to maneuver through the new Windows or the new Macintosh. I see it as something that is fun, so when the new technology comes out, I just find it enjoyable. (Interview 1)

Interestingly, John's implied definition of what technology is as being confined to working with desktop or laptop computers. How to use the tool and navigate the operating systems. Yet when questioned about his attitude to student uses of technology, he expanded on his understanding. He discussed how students are naturally attracted to new technologies, and advocated a positive stance to bringing their own devices: "If a student got a new iPad, I don't see a problem with them bringing them to class" (Interview 1).

Throughout class participation, John remained positive about his understanding of technology and began to consider its role in instruction in more depth. He reflected on the attitude of some veteran teachers whom he would substitute for, and summarized how "they are still more resistant to technology because they see it as a toy...these things [devices] are not toys, they are tools" (Interview 2). This is an important understanding. Whereas his experience of technology as a student was one of using computers to type papers, as something extra or frivolous, his experience in class informed his opinion that technology is a tool for teaching. He further clarified his developing understanding for how he envisioned technology integration, stating, "I don't see them [students] going to computer classes anymore, because every subject is a computer class". (Interview 3). John's understanding of technology as an educational tool meant that he now saw technology integration as an everyday, normal occurrence. It was no longer an extra.

Paul. When Paul completed his TPACK survey, he self-assessed himself as low in technological knowledge at the beginning of the class. Although a reluctant user of technology, even in the initial weeks of participation, he could see how technological knowledge was important to him as a future teacher. He wanted to be a teacher who could reach troubled

students like him, and as such he admitted technology might have a role to play in this, “I’ve got to get better at technology” (Interview 1).

At this early stage of development, Paul saw value in technology as he knew how to edit photos, and figured that would be a skill he could use to engage students. For example, if he was to visit a battlefield and take pictures, he could edit them into a presentation to help him teach students about the battlefield’s significance. However, he soon realized that such a teacher-centered approach might not be successful, and although he was still unsure about his pedagogy, technology might play a role in shaping it:

Before this class I was honestly thinking I might be a pencil and paper teacher, where actually what I want is to spark a kid’s imagination. But rather than do games and interactive activities through technology, do it in a [traditional] classroom. (Interview 1)

This tension between learning about student centered pedagogy through technology, yet teaching it without technology, was present throughout Paul’s interactions.

Tensions concerning the use of technology to support a content delivery model of instruction were most prevalent in his later interviews, where Paul admitted a change in understanding of technological knowledge, while still being uncomfortable with using it. He admitted how “the kids are coming into a world where it’s not pen and paper any more” (Interview 2), and as a result, “I’m all for technology,” however he remained reticent. For example, Paul did not like the way technology was constantly evolving, and he was concerned about the digital divide as a result, “I don’t like how technology is always evolving. It seems like every six months you have to constantly upgrade... there’s going to be haves and have nots” (Interview 2). This demonstrates Paul’s concern about the pace of change, and illustrated why he

was resistant. As a “have not” himself, he could empathize with students who were left behind by the pace of change.

Overall, Paul felt the class helped develop his understanding of technological knowledge, but that it’s focus on teaching with technology did not serve him well enough. In his final interview, he expressed how he would have liked to learn “more about the tools and what they do” rather than how to use them in instruction. Paul’s position supports the old model of the course over this new iteration. He explained how he wanted to learn about tools to help him as a teacher, implying that he was not interested in learning about tools which can help students learn.

George. George’s experiences with technology were limited, and as a result he was ambivalent about his level of technological knowledge. When asked how he might use technology in his instruction, he described a scenario where, “I don’t think technology would be the first thing on my list...how would I deliver it [content] through some sort of PowerPoint or lecture” (Interview 1). Although he had experience with using blogs and a learning management system as a student, he did not consider them useful to learning. However, he did see technology as useful for teachers as a way of creating a “review of information.” So, at this early stage of the class, like his peers, George’s limited pedagogical knowledge also limited his knowledge of technology. For him, technology was a means to enhance teacher centered information presentation.

However, as participation in the class progressed, George expressed a change in his self-reporting of technological knowledge. For him, “just the exposure [to technologies] is beneficial” (Interview 2). Indeed, he felt that his technological knowledge growth outweighed his understanding of pedagogy. In his surveys, his agree statements about his assumed pedagogical knowledge remained the same. While his skeptical responses to the technology questions moved

to “agree” statements. Nevertheless, he was still limited in expressing how he might use technologies. He personally found discussion boards “tedious” (Interview 2). For George, the decision to use technology had to be taken with care: “If you’re going to take 20 minutes of your time, it’s not going to be 20 minutes wasted” (Interview 2). Therefore, he remained steadfast to his K-12 experiences, placing value on the use of technology like Kahoot, to play review games to support how his students learned content from his lectures over them using an online discussion platform. Recall that George felt he did not learn best from discussion and collaboration when he was a student, so there is a consistent line in his consideration of technology integration.

When asked to describe his favorite activity, George chose the task where students had to select activities for use with an interactive white board. He liked how the board encouraged students to “come up and do stuff” (Interview 3). Teacher-centered technology use was at the forefront of his thinking. He noted, “My idea of a class would be starting with a PowerPoint along with lecture...then a quick review or quiz...then the kids can come up and do stuff on the whiteboard” (Interview 3). As this shows, George’s limited understanding of pedagogy influenced his comfort with technology use. George appreciated the use of tools to support his role as a teacher (like the Excel task, or whiteboards), but was more critical or discerning of activities involving technology that was student centered.

Richard. Richard described himself as “old fashioned” (Interview 1). As with the other participants, his perception of his technological knowledge was shaped by his experiences as a student, and his exposure as a K-12 student. Richard was a fan of learning management systems like Blackboard™ because they allow students to submit papers. But when asked about his

potential uses for technology integration in his instruction, his response was, “I prefer not to use it” (Interview 1).

Richard’s position on technology integration was not completely negative like Paul’s. He did state from the outset that he had an open mind:

I am always open to learn about it, it’s just a lot of technology...it’s more of a headache than it’s worth...if I learned more about it I feel like I could see it being implemented in an educational situation. (Interview 1)

At this early stage of the course, Richard’s idea of technology use, much like other participants, was to support teacher-centered instruction, particularly lecture. He expressed how movie clips might be shown to enhance instruction, and use a discussion board to have students comment on it.

Later in the class, Richard showed a slight shift in technological understanding. In his second interview he expressed how technology might be used by students to learn in their own time, and justified his shift as keeping up with the times, “I think in this day and age where every kid has grown up immersed in technology that it just makes sense” (Interview 2). Even though this was a slight shift in approach, Richard did not change his self-evaluation of technology knowledge on the survey. He was still comfortable with his knowledge, but unsure how to apply it to instruction.

However, Richard did express a shifting position on his understanding of the role of technology. In his second interview he stated, “Technology has a place, and it can engage students in what a lot of students may find dull” (Interview 2). So, Richard now acknowledged an understanding that technology might engage students, but he was still unsure how. Where his

knowledge did improve was in doing the Excel assignment, as it was “something I could see myself using in the future” (Interview 2), and learning about Web 2.0.

Of all the participants, Richard’s understanding of technology improved the most throughout the course. By the end of the course, he was better able to articulate how he might use tools in his teaching. Although still highly impressed with Excel, he now understood how using Web 2.0 might be “fun and interactive for the kids.” However, he remained focused on how technology could be used to enhance his presentations. “The technology has the ability to bring more of a visual aspect to it” (Interview 3). Although Richard’s understanding of technology and certain tools improved through the class, he was still conflicted and sometimes unclear about exactly how it would be implemented.

Pete. Of all the participants, Pete self-evaluated his level of confidence with technology higher than the others and declared himself strong in technological knowledge. He was a self-declared, “big proponent for technology” (Interview 1), describing how he was fascinated by the impact of technology, from a historical viewpoint: “People embrace newer and newer gadgets that can do more and more stuff, and I find that interesting given the history of how the introduction of that stuff impacts society” (Interview 1). At the beginning of the course, Pete saw technology as something that could help content delivery and measuring understanding. For example, he advocated using polling software with students to find out what they think. Unlike the other participants, Pete was critical about being forced to learn the use of certain tools. He particularly disliked the Excel assignment as “nearly every school system has an electronic gradebook now” (Interview 2). He also felt that he was being forced to use tools that he was already familiar with in some assignments, so his technological knowledge was not growing

sufficiently: “There are few things in class that she has talked about that I have not already used a version of” (Interview 3).

Although his familiarity with technology was not specifically enhanced by his class participation, Pete’s understanding of how to blend pedagogy with technology was enhanced. He described how he could use technology to increase “interaction and collaboration, teacher to student interaction technology is great” (Interview 3), and he advocated for the use of blogging and video chats to enhance student discussion. This shows a shifting of how to use the technology to support his ideas of what social studies teaching should be. Pete did not develop much pedagogically, but he became better able to articulate how technology might be useful for teaching and learning.

Summary. As I examined the course content along with the interview data it was noticeable how participants struggled with successful technology integration in social studies that went beyond teacher-centered content delivery. For example, John was adamant social studies as a discipline was not suited to incorporating technology. He understood technology as a tool to help the teacher, but he felt successful incorporation was too challenging. Conversely, Pete felt that the approach of the course in promoting a technology-inclusive mindset was an extreme, yet effective, way of making him think about teaching and how to use technology tools. As an advocate for technology, he could see the potential for technology to promote interactivity, but he felt that more scaffolding was needed in his planning for students to be successful. Effectively, Pete had ascertained the best way for him to incorporate technology was to use audio-visual applications to deliver content to students in a more appealing manner than lecture. Pete also feared not knowing enough about technological tools. His belief was that the teacher always needs to know more than the students, even in how to use technology tools. In his third

interview, he stated: "...students that don't know become teachers that don't know. I never want to be that teacher" (Interview 3).

Consistent among all the participants was a firm belief that technology tools enhance content delivery. They all appreciated the module about the use of interactive white boards for delivering content, as well as the module on assessment in which they could write quizzes using Web 2.0 tools. Pete was adamant that teachers need to know about technology tools to assist with this, while John and Paul both felt the TPACK plan facilitated participants in thinking about integrating technology. Ultimately, by completing TPACK lesson plans, they felt the class helped them use technology to better deliver content.

Social studies (content) knowledge. The educational technology class was not content specific. Indeed, it was open to both secondary and elementary teacher candidates from multiple disciplines. However, as I explained in the context chapter (Four), the instructor intended for students to engage in content knowledge through the creation of TPACK plans for technology integration focused on the state standards. Using these plans as an impetus, along with their answers to the TPACK survey, I could ask questions about the participants' development of their content knowledge.

John. John was confident in his mastery of content knowledge. He agreed with statements in his survey which indicated a strong self-evaluation. As we discuss each participant, we will see that this is not unusual. Moreover, John also felt that as he had some experience in classroom settings, gained from substitute teaching, he was in a good position to put his knowledge into practice. As I described in the pedagogical knowledge finding, John wanted to go "beyond the textbook" to find information. However, his description of social studies as a discipline limited how he could approach his pedagogy, "...so much of social studies is facts,

and it's like when a lot of people think about social studies and history, they just think dates, and they think if it's like in art history you're just viewing" (Interview 1). Therefore, at the beginning of the class, he felt that social studies were all about historical facts.

Table 5.3

TPACK Survey Results – Content Knowledge

Survey Number	One	Two	One	Two	One	Two	One	Two	One	Two
Pseudonym	John	John	Paul	Paul	George	George	Richard	Richard	Pete	Pete
I have sufficient knowledge about social studies	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree
I can use a historical way of thinking	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree
I have various ways and strategies of developing my understanding of social studies	Agree	Strongly Agree	Agree	Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree

Interestingly, when he took the survey the second time, he indicated strong agree statements on the questions relating to his content knowledge. When asked about this in his interview, he described how having to think about pedagogy made him think about social studies in different ways. It was no longer about history and learning facts, but more to do with “their [student’s] perspectives on society, on their history, on the way their society is structured and inviting them to come, express their ideas, and to just learn about their society and the world around them” (Interview 2). I asked John whether anything in the class particularly developed his developing understanding of what social studies as a discipline was, but he was unable to

attribute it to any one thing. However, he did mention how having to plan instruction aligned to standards forced him to think deeply about what he wanted his students to learn and how.

As he progressed through the class, John's more nuanced understanding of content knowledge, and his realization that social studies as a subject was about more than learning historical facts, caused him to consider a deeper rationale for instruction. This will be explored later in this chapter. However, it is significant how participation in the class led John to re-conceptualize what he considered social studies to be, and to expand his understanding beyond historical knowledge and thinking.

Paul. As I described in Chapter Four, Paul had a deep-rooted love for history content and military history was his area of expertise. It was no doubt, therefore, that he self-assessed his content knowledge as high in his initial TPACK survey. When asked to define his understanding of social studies, Paul described it through a historical lens, explaining how history is important because it is always repeated. He described his interest in American military history because, "you're grown up to believe America is the best" (Interview 1).

As with John, Paul's understanding of what constitutes social studies content knowledge evolved during participation in the class. Rather than history being an important collection of facts to be remembered, Paul acknowledged the role of critical thinking and understanding primary sources in the content. He was also keen to assert that in social studies, "you have to write properly" (Paul, Interview 2). Although fundamentally still focused on social studies as only being history, after a few weeks in the class, his understanding of social studies content knowledge evolved to include some skills, critical thinking, working with sources, and writing.

George. Like the other participants, George considered himself strong in his content knowledge, although in his first interview he was not forthcoming about what constitutes social

studies as a content area. As with the others, he was history oriented in his stance, and believed that his major in history would adequately prepare his level of content knowledge. However, his school experiences made him aware of geography and maps as another part of social studies beyond history. By the time of his second interview, George still rated himself as strong in his content knowledge on the TPACK survey, and could now give an explanation as to what social studies might be. He said,

I think social studies, especially history, lends itself to being able to take information, critically think, and put your own sort of product out there. Especially now with the standards, and with math and reading. I think social studies is one place where there's still room for critical thinking. (Interview 2)

Although Georgie still viewed social studies through a history lens, he was now able to conceptualize social studies as a collection of skills as well as knowing facts. For him, the key skill was critical thinking, although what that meant, and how it might look in his social studies class, he could not fully articulate.

By the end of the class, George's understanding of social studies content knowledge evolved further. He placed a strong emphasis on the role of critical thinking in the content, but could explain in more detail what that meant to him. He noted, "I think in social studies critical thinking is the most important reason...in a history course you're looking at information. You're processing the information, and the developing an opinion or a statement based on the information that you have analyzed" (Interview 3). Once again, George still viewed social studies through a predominately historical lens, but his participation in the course helped him better articulate what history content knowledge is and this in turn began to develop into a burgeoning rationale, which I describe later.

Richard. We already know that Richard was one of the quieter participants and sometimes reticent to go into detail about his thoughts. He was a self-confessed history nerd and in his initial TPACK survey he answered with mainly “agree” statements to the content knowledge questions. This is like the other participants. Similarly, in his second survey he rated himself at the same level of content knowledge, seeing himself “as still strong” (Interview 2). However, by this stage of the class he was less reticent about articulating his understanding of social studies as a discipline, explaining:

being able to memorize dates and stuff is dull...social studies teaches them [students] to think on their own...being able to read primary sources and analyze them for what they are, being able to read secondary scholarship and deduce whether you think the argument is valid or not. (Interview 3)

Participation in the class exposed Richard to the state standards, of which the first is a standard about using primary and secondary sources. Through this exposure, Richard’s understanding of social studies content was enhanced to include the skills associated with source work. As with the other participants, this shift in understanding of content, although small, does lead to an influence in his burgeoning rationale.

Pete. Consistent with the other participants, Pete mostly agreed with statements on the TPACK survey addressing his self-assessment of his content knowledge. As with the others, his first interview indicated that his understanding of social studies was as a subject which was mainly rooted in history and historical skills. Unlike his peers, Pete had an appreciation for the skills involved in the teaching of history stating, “I think discussion is important...I would like them [students] to be analytical” (Interview 1).

As the course progressed, so did his understanding of content, and his confidence as he was increasingly candid in his willingness to discuss all aspects of his development. By the time of his second interview, Pete was better able to articulate the relationship between each strand of the TPACK framework. However, even though he remained confident in his content knowledge, his understanding of social studies only evolved somewhat. From it being a content rooted in historical skills, Pete began to develop a lens through which he might be able to demonstrate his knowledge. He stated, “Kids need to be more involved with the different types of people there are in the world” (Interview 2), indicating that his understanding of social studies was more global and diverse, and less about history as a subject. When I asked him about his content knowledge in his final interview, he clarified his position stating, “I like to focus on culture, world culture geographically” (Interview 3). Pete then explained how he wanted his social studies instruction to instill a deeper understanding of other cultures, as well as raise awareness of geographical issues and skills. This is a distinct evolution of understanding from one where social studies is mainly history, to a more nuanced vision of social studies developing cultural awareness through the teaching of geography. It was a different position to those taken by his colleagues.

Summary. At the beginning of the course, participants indicated on the survey how they were confident in their content knowledge. It should be noted that at this stage, they were at least two years into their degree program, so most participants had taken several content courses (usually history) offered by the College of Arts and Letters. They all expressed how they either had a love of, or were good at, history and so considered themselves to be at a reasonable level of expertise in the social studies content. They all assumed that majoring in the subject at undergraduate level was evidence of their content expertise. Yet knowing enough history to gain

undergraduate credits, and knowing the skills of history (such as sourcing, inquiry, inference) are not the same. Likewise, this assumption clouded their perception about their readiness to teach history. They felt they were confident with the facts, but were clearly not grounded in any pedagogy, despite their self-assessments in their initial interviews.

Participants' perception of social studies as only history, and their conceptualization of history teaching as the conveyance of history content from teacher to student, was at the forefront of their consideration and understanding of this aspect of TPACK, especially at the beginning of the class. For example, John described how history consisted of mainly facts and dates at the outset of the class.

For John, social studies content involved remembering dates and events, which was something that could be achieved better by using flashcards. Technology was not considered a purposeful tool to help with limited content delivery needed to enact his understanding of social studies pedagogy. However, John also stated in a later interview how by creating TPACK plans, he had to engage with the standards, and this improved his content knowledge even more. So even though John considered himself a content expert, participation in this class enhanced his knowledge further. This development of content knowledge was by and large repeated by Paul, George and Richard, who began the class focused on how they might deliver historical facts to students, and later began to consider what skills those students might need to better do history.

To a different extent, Pete indicated an interest and focus on cultural geography as a lens for his social studies instruction. He believed the purpose of social studies was to promote cultural awareness and as such, teaching his students geography was the best way to do this. Like his peers, he felt his content knowledge was strong from the beginning of the class. In his second interview, Pete expressed the opinion that teachers were the classroom experts, and their chief

problem was in relating essential knowledge to their students. Pete was adamant that strong content knowledge was most important, and technology distracted him from this: “so it comes down to what are teachers able...what do they know and what resources do they know to go to get those things at the right prices and stuff like that” (Pete, Interview 2). For him, the class reinforced how important it is for him to know the content well so that he can convey it better. However, by the end of the class, he expressed a liking for project based learning as a method for students to show they had learned the content well enough. Consequently, Pete remained a firm advocate for using technology to support teacher centered content delivery, but began to shift his stance on how students might demonstrate their learning of content.

Where Technological, Pedagogical, and Content knowledge overlap. Perhaps of greatest interest are findings that occur in the areas of TPACK that overlap. As I explained in Chapter Two, the TPACK model posits the ideal teaching moment happens when technological knowledge, pedagogical knowledge, and content knowledge are all integrated in student learning at the same time. Participants in this class were afforded opportunities to demonstrate an understanding of these opportunities through completion of their TPACK plans.

For example, participants considered how their students might collaborate and create their own content to demonstrate understanding of their learning. Examples occurred at several points in the class. For example, in module two, *Learning by Creating*, participants had to identify Web 2.0 applications to facilitate students’ creativity. Collaboration was also the focus of module three, where students were encouraged to work together to share their learning about Web 2.0 tools. In the lesson observation notes, I was intrigued by the possibilities afforded the participants. They had each previously expressed a teacher-centered focus in their pedagogy, and were generally limited in their understanding of how technology could be leveraged, so this was

Table 5.4

TPACK Survey Responses – TPC Overlaps

Survey Number	One	Two	One	Two	One	Two	One	Two	One	Two
Pseudonym	John	John	Paul	Paul	George	George	Richard	Richard	Pete	Pete
I can adapt the use of the technologies that I am learning about to different teaching activities	Agree	Strongly Agree	Agree	Agree	Neither Agree or Disagree	Agree	Agree	Agree	Strongly Agree	Strongly Agree
I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn	Agree	Strongly Agree	Agree	Agree	Neither Agree or Disagree	Agree	Agree	Agree	Strongly Agree	Strongly Agree
I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom	Agree	Agree	Agree	Agree	Neither Agree or Disagree	Agree	Agree	Agree	Agree	Strongly Agree
I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom	Agree	Agree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Agree	Agree	Agree	Agree	Strongly Agree
I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district	Agree	Agree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Agree	Agree	Strongly Agree	Strongly Agree
I can choose technologies that enhance the content for a lesson.	Agree	Strongly Agree	Neither Agree or Disagree	Mostly Agree	Agree	Agree	Agree	Agree	Strongly Agree	Strongly Agree
I can teach lessons that appropriately combine social studies, technologies and teaching approaches	Agree	Strongly Agree	Agree	Agree	Agree	Agree	Agree	Agree	Strongly Agree	Strongly Agree

an opportunity for a pedagogical shift. Although not every participant was able to make a significant shift, I will provide at least one example of how the class influenced their thinking about instruction with technology.

John. I found that John embraced the potential of Web 2.0 the fullest. He highlighted the creation of an audio story as one of his favorite activities. He acknowledged the creative aspects of the assignment and how Web 2.0 tools help student creativity. However, in his last interview, he affirmed technology “is a tool not a toy.” He continued, “I like infographics, if the teacher produces it they can use it instead of PowerPoint.” So, his understanding was of technology as beneficial to content delivery for the teacher. However, in the next sentence John stated, “I can see the benefit of switching to student-centered products. This is different to how I saw myself teaching” (Interview 3). Therefore, John’s experience provides a strong example of how exposure to the TPACK framework encouraged a shift in theoretical understanding but was not reinforced in pedagogical enactment. John created products that were teacher-centered and did not encourage collaboration even though he claimed to think differently about how he might use technology in his instruction. The disconnect between intention and enactment is something I will discuss in Chapter Five.

Paul. Paul began the class with a limited understanding of what pedagogy was, and he ended the class with a similarly limited understanding. Paul remained skeptical about his use of technology, and his understanding of content was limited to history, although he developed an appreciation that history was more than facts and involved critical thinking, and his pedagogy remained largely teacher-centered. When he produced TPACK plans, Paul used technology to enhance content delivery. For example, he liked the idea of creating a review game to help the students learn facts, and he thought online quizzes would make his job easier to manage as it graded for him. We spent some time discussing his favorite activity, the infographic. Paul interpreted it as a method to get the information to the students in a way that they might better

understand. He noted, “If it’s projected on an overhead or if it’s projected onto the screen in front of class it can definitely be used” (Interview 2).

Because he adopted a teacher-centered approach to instruction, and saw technology as a tool for transferring content from teacher to student, he did not relate well to the potential of Web 2.0 tools to enhance his instruction. He struggled to write TPACK plans that aligned student learning to standards and instead saw these applications again as methods of content delivery. He was intrigued by the potential to edit visuals online, which he felt might benefit his presentations. Yet he completely missed the potential for students to create content to show their learning. This was likely a direct result of his limited understanding of how technology, pedagogy, and content combine.

George. Even though he was open-minded to the use of technology in social studies, George also struggled to demonstrate how each strand of TPACK might combine in his instruction. George remained teacher-centered in his understanding of pedagogy, and that informed how he might enact technology enhanced social studies instruction. For example, he was drawn to the interactive white board activity as he could see how he might use the tool to teach and lecture from, but he was skeptical of how any of the other aspects of technology teaching might be better in a social studies classroom. He saw teachers as having to use technology “to better convey the content in a way that people can easily understand it and interpret it for themselves” (Interview 2). He felt that the key to good social studies teaching and learning was a good lecture followed by a well-written student paper. Technology has little role to play in this model.

By the end of the course, George was still unable to demonstrate meaningful TPACK. Like Paul, he struggled to understand how Web 2.0 might be useful in his classroom, stating how

“these activities might be good to break up the boredom” (Interview 2), implying that they were frivolous and superfluous to the “real” learning. At the end of the course, George described his vision of teaching with technology. For him, lessons would

Begin with a lecture as the foundation of what’s going on. They would get readings to let them learn a little for themselves, and I think discussion is important, even for critical thinking skills...it is important to be able to listen to others and argue your point...talking things through is a great way to develop critical thinking skills...not everyone can do lectures and papers solely, so I think learning technology instead and then using these different technologies can break up and maybe give those individuals a better chance to understand the material. (Interview 3)

George’s vision was one in which using technology in social studies was an accommodation to help those students who struggled with traditional lecture and paper writing. At the time I inferred that he viewed technology use in social studies as a way of dumbing down the curriculum for his students. However, he showed a developed understanding of what the class expected of him, as now he was thinking about “teaching around technology, rather than with technology” (Interview 3). Even though George was unable to demonstrate teaching with technology, he understood how he was expected to go beyond that.

Richard. By his second interview, Richard acknowledged how technology had a role to play in instruction as “it can engage students in what a lot of students may find dull” (Interview 2). He enjoyed the Web 2.0 assignment as well as the Excel task. He could see himself using Excel to help with data analysis; however, at this stage, he still envisioned using technology in traditional “book based assignments...they are more old-fashioned” (Interview, 2).

As he neared the end of the class, Richard was better able to convey in his lesson plans a merging of aspects of TPACK. When evaluating his TPACK plan for Web 2.0 in his third interview, he commented how “you can use it (Web 2.0) to make very interactive assignments that get the students engaged and let them think on their own to kind of master critical thinking skills” (Interview 3). He gave an example of having his students use Web 2.0 to create a wikibook that would demonstrate their understanding of the content. Therefore, Richard could see a student-centered use for technology in his pedagogy, even though his main use of the technology would be, “to bring more of a visual aspect to it...as a way to convey something that happened 150 years ago, it makes it more connectable” (Interview 3).

Pete. From the first interview, Pete expressed a desire to promote collaboration in his pedagogy, and he liked the potential technology allowed for this. He felt that not everyone, perhaps even his own instructors at the university level, fully understood the importance of group work. He stated in his second interview “collaboration is very important...technology promotes interactivity and collaboration.” He used the example of the group assignment as one which he felt the other students did not appreciate. On reflection, he felt that with more structure, the other students may have been able to play varied roles in the collaboration process. For example, he suggested to “have outsiders from other groups as critics” to peer review the work. Because he was keen to consider how technology can be used to leverage collaboration, he mentioned in his second interview,

I’m likely to use Scribbler. It promotes an interactive classroom. It has a variety of tools and uses – paperless, quizzes, and surveys. I like that it can give immediate feedback...I also like the infographic. It’s a report with pictures. Audio visual is still the way to go, I like seeing it being performed. (Interview 2)

In his third interview, Pete developed these ideas further: “I’m most likely to incorporate blogging and video chat...Students should share knowledge and information...students should teach students.” (Interview 3). Pete’s position regarding the merging of technology into his pedagogy was enhanced and better defined through his participation in the class. Although already an advocate for technology in the classroom, Pete’s in-class experiences served to clarify his position and gave him a focus about how he might better incorporate technology.

Of all the participants, Pete most wanted to teach with technology. For him, participation in the class, for him, helped better his understanding of how Technological, Pedagogical, and Content Knowledge all blur. Thus, the class helped reinforce Pete’s position as an advocate of technology, and promoted a deeper understanding of a student-centered approach to social studies instruction with technology.

Summary. Overall, through participation in the class, teacher candidates could develop aspects of TPACK and construct plans which reflected a combination of technological, pedagogical, and content knowledge, to varying degrees of success. John and Pete, through their use of Web 2.0, demonstrated a fuller understanding of how social studies instruction might be enhanced through technology. Their lesson plans had students using technology to show their understanding, while teachers facilitated the learning with student-centered pedagogy. Pete went further by considering how collaboration tools might be used to enhance student discussion and better develop their understanding.

At the other end of the spectrum were Paul and George, who remained steadfast in their insistence that good social studies instruction revolved around teacher delivered lectures. For them, technology had a use as a teacher tool to create better visuals. For example, Paul wanted to create more infographics to make the content easier for students to understand. While George

saw interactive elements of technology as distractions from the real learning, although they may be helpful for students who struggle with understanding lecture.

Richard's use of TPACK was in the middle of the participants. He could see the potential for students to demonstrate their understanding by creating content, in his case through the creation of a wikibook. However, he was still focused in using technology to enhance his delivery of content to the students. Web 2.0 applications could supplement the writing of essays or papers, but they would not enhance or change how they would learn the content. That would be dependent on his expertise as a deliverer of content to his students.

Development of Rationale and Vision for Teaching Social Studies

Although the development of rationale or vision was not a stated aim of the class or the instructor, participants did begin to consider reasons for teaching social studies, and for two of the participants, for integrating technology into social studies instruction. As with the other findings, each participant developed rationales to differing extents. For some, the evolution over time was easy to spot, while for others, less so. I will address each participant in turn, attempting to address how their rationales developed as the course progressed.

John. At the beginning of the class John could articulate a vision for how he wanted to teach, which was influenced by his experiences as a substitute teacher as well as his K-12 apprenticeship of observation. By the end of the class John felt he did not yet know enough to fully articulate a vision or rationale, yet he was willing to “be vulnerable and learn with the students” (Interview 3). He reasoned that technological tools were helpful to his future instruction and could assist him as a teacher to teach with depth and complexity and go “beyond the curriculum” (Interview 2), implying that there was more to teaching social studies than delivering standardized facts. When pressed, he could not express an example of how this might

happen, although he did share an unrelated example of how his students could use their smartphones to look up facts. This example demonstrated how he could see technology helping with content delivery because content is now in the palms of his students' hands, demonstrating his learning of technology, but in no way, did this illustrate how he might go beyond a reliance on fact based pedagogy.

John also expressed how participation in games, field trips, and collaborative group work all help make social studies more interesting as a subject. He saw the need to use technology for enhanced student engagement. This was a radical shift from his experiences of learning and his expression of how he saw himself teaching social studies at the beginning of the class. However, as much as John viewed the integration of technology as a positive part of his future teaching, he expressed a feeling of limitation. His understanding of the curriculum as expressed in the standards was of a mainly fact-based curriculum focused on content acquisition. As such, he felt it best to teach facts by going beyond the textbook and using technology to access other resources, such as primary sources. He also expressed how teachers he had worked with in school buildings were already resistant to technology integration which meant that any effort for him to go further would be problematic as a new teacher.

John was also able to envision how his use of technology might be perceived from a students' perspective. He could see how using technology reduces conflict, increases engagement, and encourages a better attitude to learning. His focus on the students' needs demonstrated a profound change in his vision. Through his course experiences, John began a shift away from a teacher-centered, content delivery vision for his teaching, to a more student-centered approach to social studies instruction. This shift was evident in the second interview when John acknowledged how "there are more ways to demonstrate learning besides essays"

(Interview 2). He further explained how he envisioned a different role for students in his classes: “...if you can teach them how to learn on their own or how to research, for example, then even when they’re out of your class, they can continue to do their own research.” It was evident John’s experiences with the flipped model of instruction, and his consideration of TPACK, had begun to form a shift in his vision for social studies instruction. Technology tools could help him enact his developing vision.

By the time of his third interview, John had formulated a purpose for social studies instruction. He realized that one role of social studies is to help learners construct an understanding of society for them to participate as full citizens once they are adults:

...just offering students a perspective on society, on their history, on the way their society is structured and inviting them to come and to express their ideas, and to just learn about their society and the world around them I think is very important. If you don’t understand your society becomes harder to participate, and if it’s harder to participate, if something’s going wrong, it may be hard to change it, or it may be hard to even exist in a society that you don’t quite understand, so that’s to me what I remember about history and social studies is just learning things that actually I feel like you know, would impact the way that I live my life...and you know putting stuff in historical context helps you to think critically about almost everything...and then you find ways to connect...to connect the dots. (Interview 3)

Although not explained as such, John implies how participation in the class had led him to think about how he might teach social studies for participatory citizenship which could be achieved by teaching students to critically think about historical issues in a modern context. Although not a

result of any overt consideration of social studies purpose, his engagement in the standards and creation of TPACK plans at least prompted consideration of the matter.

In the same conversation, John was asked to explain what sort of things we might see in his future classes. John explained:

Now what I see in a history class that I was conducting would be something like students filming a skit with an iPad and then introducing little movies, producing...it's like instead of a PowerPoints, maybe they're coming up with a play and actually have somebody film it, and then they are editing their film and learning history like maybe making a film.

So, John here is explaining how he could see technology being leveraged to have students produce content and learning through making the film. He went on to contrast his vision with traditional social studies classroom practices:

...and just like seeing the rigid classroom structure where teacher lectures and the students sit and take notes that's such a classic way of learning history, and I'm not saying it's bad. That's probably how it's been for a very long time, kind of you listen while the person who knows speaks, and you take notes, and you just learn what they say, then you spit back on a test.

However, John was conflicted about whether the teacher-centered knowledge delivery model should be abandoned. He continued:

But still I don't think I would give up on that, because it's like...because a lot of times when a teacher does have something really interesting to say, you can stand in front of these students and they will listen if you know, you can grab their interest...I would definitely still lecture and things like that, but I would – I would be more creative with

the assignments. I think writing papers is important for college, so even that I'd be reluctant to just give up on it

John displayed an understanding that he could use technology to pique students' interest, and maybe give them alternative assignments, but there was still a need for teacher centered content delivery, and traditional assessment practices. His reason for this was that students would need to write papers for college.

Nevertheless, John also expressed how class participation had reshaped his prior experiences:

...because lecturing and papers, that's how I, before I took the class, that was my experience with history, that's how I thought of it. Now I don't think I can give that up, but I would incorporate a lot of other things, a lot of other activities and combine them together.

Although this is a long quote, there is much evidence to unpack which are useful for our understanding. For example, John showed how the class influenced his pedagogical thinking and his attitude toward technology, by having students create movies, and producing content. Initially, he outlined a student-centered approach to teaching social studies, with them using technology to demonstrate their understanding. However, he was still reluctant to give up all that he learned in his apprenticeship of observation. His love of lectures, and assumption that interesting stories will grab student attention on their merits, coupled with his insistence that his students write a paper after making a movie, demonstrate how important his experiences were in shaping his vision for teaching social studies. For John, although he could rationalize a purpose for teaching social studies, his vision for making it happen was still rooted in his experiences, in

what worked for him as a student, and a sense of distrust that anything other than a written paper is a valid demonstration of learning.

Paul. Paul reflected upon how his own apprenticeship of observation influenced his thinking: “If I had devices when I was in school I would definitely do it now” (Interview 3). Recall from Chapter Four how Paul’s experiences of school were generally negative and he did not experience examples of learning with technology. Indeed, Paul was a self-confessed technophobe. He possessed a smartphone but was yet to use email on it. Therefore, it can be inferred that Paul’s minor change of pedagogical stance was directly influenced by his participation in the class.

Paul began the class with a view that he would be motivating for his students because they would be impressed at his passion for history. As he progressed in class, his passion was not disturbed, however, he grew to realize that it was his responsibility to address issues he had not yet considered. For example, in learning about students with disabilities, he realized that he might have to make his material more accessible for his future students. As a result, he stated that he might use digital editing software to create better visuals to enhance his lectures. He also explained in his final interview how he saw a need to make information easy for students to understand, as a result, he expressed how he might use Web 2.0 tools like infographics to make information easier for his students to understand.

Paul started with a rationale that history was important and interesting if the person teaching it was smart and interesting. He envisioned teaching without technology. Participation in the class slightly moved his stance from someone with limited experience with technology in his learning, to be someone who acknowledged that with more exposure, he would use technology and devices in his future instruction. However, even though his stance became more

positive toward technology integration, he was still reluctant to use it in his current practice. His TPACK lesson plans rarely showed a deep understanding of how to successfully integrate technology to help students learn. Instead, Paul used his plans to demonstrate how he might use technology to help him deliver content to students.

George. For George, participation in the class confirmed his initial concerns that what he had learned in his apprenticeship of observation was inadequate to meet the needs of all students.

In his final

I know that papers work for me, but I was aware the whole time that it doesn't work for everybody, and how since then I think learning or being exposed to these new technologies or lessons, I can better understand how I can fit those into my teaching.

(Interview 3)

George's participation in the class confirmed for him how his apprenticeship of observation might not serve all students in his future teaching. Participation in the class influenced a shift in pedagogical understanding which, although unrealized in terms of potential enactment in his TPACK plans, did lead him to consider his rationale as a social studies teacher. At the beginning of the class, George's vision was that of a teacher who could lecture, demonstrate knowledge of content, and would have students learn content, write papers, and take tests. Exposure to the module on students with disabilities influenced his thinking. George realized that technology could play a role in meeting their needs. Furthermore, he had not previously considered the legal and moral implications that students with special educational needs bring. He began to reimagine his purpose for social studies instruction as so:

I think you teach social studies to develop critical thinking skills. I think that's probably my main aim as a teacher is getting not just teaching social studies, you're teaching skills

for students to carry on, because nobody is going to...once they get to college, they're going to need the skills where I think you can pretty much only learn in the social studies or even language arts class, there's a lot of times you're going to need those skills before you have to use them in college or work (Interview 3).

Participation in the class led George to articulate a developing rationale for his teaching. At this stage of his learning to teach, he realized that he wanted to teach students to develop transferable skills they can use in college, work, or anywhere. For someone who was in his first educational class, George's rationale became clearly defined, especially in comparison to the other participants. However, George was still uncertain what critical thinking skills were, what they looked like in social studies contexts, and whether technology skills would form a part of this important skill set. George was certainly beginning to develop a more coherent rationale for his teaching, but there was still a long way to go for it to be fully realized.

Richard. Richard was slow to evolve any vision of social studies instruction which went beyond teaching content to students because they need it for assessment. His preferred pedagogy was the lecture, notes, paper writing model which he had been exposed to during his apprenticeship of observation. Throughout the class, and evident in the data, Richard was reluctant to move away from this mode of instruction.

Richard's disposition toward future enactment as documented in his TPACK plans showed uses of technology to help him with content delivery. Like Paul, Richard saw infographics as useful in conveying complex information to students. In his work with Web 2.0 applications, he realized how they might be useful for alternative methods of assessment, so that his students can go beyond writing papers to demonstrate understanding. This was articulated in his third interview. By the end of the course, Richard could describe a changing vision for his

instruction which now involved technology use. He admitted that at the beginning of the class he was not sure how to apply technology to the social studies classroom. But he saw “it as a good way to get...relatively fun but fairly engaging assignments with students” (Interview 3).

Similarly, the idea of student engagement would influence a subtle change in his vision. He described his vision as so: “You have lecture and note taking depending on the structure...it can vary from grade level it is or what course...but if students are not engaged with whatever they are learning, it’s going in one ear and out the other” (Interview 3). This was a subtle change in his vision. Although he was yet to articulate a reason for teaching social studies, his vision for pedagogy was shifting somewhat. By the end of the class, he was still focused on lecture and notes as his content delivery method, but he also understood the need for students to become critical thinkers, and to be engaged. Although he was not convinced, meaningful integration of educational technology could help him achieve his aims.

Pete. Pete was already an advocate for technology integration to promote collaboration. At the beginning of the course he expressed a desire to make his students more culturally aware, so unlike his peers he was in possession of a burgeoning rationale from the outset. Moreover, he already realized how the role of teachers was different to what they were when he was a student. He appreciated the power of discussion and collaboration and expected teachers to facilitate in this.

In his second interview, Pete expressed an understanding that “Kids can do what adults can do. Technology is a leveler” (Interview 2). This perspective outlined how we was beginning to view classroom teachers less as experts and more as facilitators of learning. He also expressed how teachers should accept social media as a tool they can use, although at this stage he was

unsure how best that could be achieved. His understanding of the changing role of teachers was best summarized when attempting to explain what a social studies teacher should do:

The value is not only being able to teach it to somebody but making it so it comes from you that somebody can understand, because you can know whatever you want to know, like and that goes back to a student who is 15 years' old, how to use it, what's the point of me knowing it? If my job is to give you information that you can use to progress your own knowledge and I can't do that, then there's no point in me having known the subject in the first place. (Interview 3)

For Pete, delivering social studies content to students was not the role of the teacher. This was an implied understanding at the beginning of the class, but evolved into a definitive point around which his rationale was based. His position evolved to one in which he was beginning to value pedagogy over content and he saw how technology could assist in the process.

As we already know from Chapter Four, Pete was different to the other students in that he was more mature and this influenced his approach to the class. In his final interview he expressed how, "one of the things I like to focus on most I guess is culture, world culture, geography" (Interview 3). Effectively, through participation in the class, Pete not only developed a vision for how he might teach, but he also began to conceptualize a rationale for social studies instruction. For him, his rationale for social studies instruction was to teach for cultural awareness in his students.

Summary. For John, Paul, and George their rationales shifted to an understanding that social studies should be taught purposefully with the students at the center of instruction. However, all three participants were unable to fully abandon their preconceptions about how they should teach social studies. Even when they could envision using technology to engage

students in activities which promote critical thinking and creativity, they were still reluctant to shift away from what they learned in their own educational experiences. They admitted they would find it hard to abandon the format of lecture, notes, and paper writing as the best model for teaching social studies. These sentiments were echoed to a lesser extent by Richard.

Pete, on the other hand, was not distracted in his purpose using technology, after all, he was an advocate of technology-infused instruction from the beginning of the class. As a result, he could craft a more mature rationale for his social studies instruction, opting to teach through a lens of developing cultural awareness in his students. This was not an ideal he had expressed at the beginning of the class, however, as he proceeded through the class and engaged with the standards to produce TPACK plans, his burgeoning rationale took better form. In the prior Chapter, I explained how Pete already envisioned himself using technology tools to help conduct discussions, and to encourage student collaboration. Now he had a chance to consider teaching to social studies standards, he could describe what those discussions might be about. Engaging in the standards and considering technology-infused instruction helped Pete to actuate a social studies purpose for his teaching beyond the nebulous skill of discussion. Therefore, participation in the class helped Pete define his rationale for teaching social studies. While for the other participants, engaging in the class helped them to develop either a rationale for teaching in general, such as we see in George's case, or a more coherent vision for what their pedagogy might look like. The latter is true for John and Paul.

Influencing Pedagogical Decision-making

As I explained in Chapter Four, it was the intention of the class instructor to model and make overt examples of pedagogical decision-making. Perhaps the most prevalent was the decision to deliver the class through a flipped model of instruction as this pervaded every aspect

of the class. Flipped instruction as a model challenged participant's preconceptions of pedagogy because it was largely a student-centered approach to instruction. In their initial interviews, all five participants expressed how they learned well when teachers delivered content via lecture and they were assessed by writing papers. Participating in a class in which students can self-start and navigate assignments for the week's work at their own pace and discretion was a different experience for all, and challenging for some. However, not all pedagogy was modelled with technology in mind. The class discussion in module 2 was conducted in a traditional manner, with teacher and students asking and answering questions "face-to-face." Surprisingly, the participants did not notice how the teacher modelled a traditional approach to the discussion. Perhaps this was due to having to navigate feelings of doubt about the flipped model. For this finding, I describe what each participant thought of the class structure, and how it influenced their pedagogical decision-making. As with the other findings, participants were affected at differing levels. Even so, I feel it important to understand how each student considered the class structure as a factor in their development.

John. John was impressed that students were permitted to manage their own learning, but in his own reflection, he did not see himself as an advocate for this model of instruction in his own pedagogy. As I already discussed, John saw himself as a proponent of lecture to convey information to students. His impression of the instructor "as more of a guide, less a lecturer" (Interview 2), was hard to interpret without considering it as a perceived slight on her ability to teach. For John, good teaching involved being able to lecture, and his non-verbal cues at this point in the interview indicated that he did not consider flipped instruction as a good model of instruction.

John was expecting a model of instruction akin to his experiences in other courses thus far. He described lecturing, and traditional assessments like tests and paper writing as his idea of what teaching is about. Although he appreciated the modelling of flipped instruction by Linda, he did not think it an effective approach. In further conversations, he implied that flipped instruction gives up control of the classroom. For him, this would not be viable as strong teachers are also in control of their classrooms.

Therefore, John was cognizant that Linda was modelling different forms of instruction in the class. He could recognize how her role was not one of content delivery, but he was not quite able to understand her role as a facilitator of learning. He still expected to be led through the class content, thus describing Linda's approach as a "guide," someone who shows the way while they explore. As he did not yet fully understand her intentions, John found it hard to fully appreciate or realize how participation in the class might affect his pedagogical decision-making. Similarly, his TPACK plans did not represent any instruction beyond delivering content and using technology for more interesting assessments.

Paul. Throughout the class, Paul was reticent about how he would use technology, and how his instruction might change beyond him being the center of instructional focus. When asked to assess how the instructor modelled instruction, he found it hard to find any examples. He was positive about the flipped classroom model, and expressed an opinion that it helped because he always had time to work on projects in class, which was good for him because he found he needed help to work with technology. But he did not pick up that it was a pedagogical approach being modeled to make him consider his own instruction.

Because of Paul's entrenched position, he struggled to produce TPACK plans which were not centered around how he would use educational technology to enhance his lectures and

storytelling. Paul's attitude toward pedagogical decision making was negative at times, and disinterested at best. His experiences as a disengaged student who became interested in the content clouded his progress in this area. Paul wanted to work with and motivate students who were like he was when he was younger, however, he was unable to convey that desire in his planning, nor in his understanding of his role in pedagogical decision-making.

George. George, on the other hand, was impressed with how the class was well thought out in advance. He praised the instructor for carefully considering the structure of the class and being so transparent,

I don't think I've had a teacher that well planned before. I think this is probably the most structured class...describing every activity and planned before we do it, so we would know at least a week in advance what we were getting into (Interview 2).

This is a result of the overt modelling by the instructor who would take time to explain how and why she was modeling a certain action or strategy. Moreover, because the course was planned out in advance, George was more aware of the class objectives. This was something he had not thought about before. Participation in the class led George to a realization that instruction takes time to plan. His concept of lecturing and using his knowledge to deliver the content to students was challenged by his understanding that student centered pedagogy, as modelled by Linda, takes time and needs to be done well in advance.

As well as considering how the planning of the class made him think more about his own instruction, George also had concerns about the placement of the class in the program. Up to this point, George's classroom experience was as a student and he had not been tasked with thinking about learning through a teacher's lens. As a result, he was worried about how to manage a classroom. In his final interview, he expressed how he might have benefitted more had he been

able to take the classroom management class before taking the educational technology class. He said, “You take the technology [class] before classroom management...it’s kind of like force-feeding the technology before learning how to...your basically teaching round technology instead of facing technology around teaching” (Interview 3). George wanted to know more about how to structure and organize his classroom, which he saw as a vital part of teaching, before he was expected to learn about using technology in his teaching. For him, this was more important.

Therefore, participation in the class informed George about how complex pedagogical decision making can be. This led him to consider his instructional stance in a new light. It also made him consider other aspects of the teacher’s role, that is classroom management. By recognizing the effort Linda went through to plan and prepare each module of instruction, George gained insight into a process he was yet to consider, and it also made him aware that he needed to consider issues of organization and discipline sooner rather than later.

Richard. Richard had less to say about the modelling of instruction. Like Paul, he was entrenched in his idea of what social studies instruction should be, and therefore was not able to meaningfully connect the instructor’s actions with his own teaching. Moreover, his lack of awareness about how Linda modelled pedagogical decisions limited his development. In his TPACK plans, his proposed instruction would be teacher centered, with technology used to enhance content delivery. George struggled with conceptualizing his instruction and like George, he echoed concerns about course placement. He felt he would have been better able to construct plans if he knew more about classroom management, and had taken methods instruction, making him more familiar with the necessary pedagogical content knowledge.

Recall that Richard self-evaluated as strong on content knowledge, while being confident in his vision of what his instruction should look like. However, by the end of the class, he

admitted he needed to know more about how to manage classrooms and how to teach social studies before he could integrate technology meaningfully. It is likely that although he did not recognize how Linda modelled pedagogical decision making, exposure to different pedagogies through participation in the class led Richard to reconsider his dispositions to the point of realizing he needed to know more about how to manage a classroom.

Pete. Pete was always willing to share an opinion about the class. He had much to say about the class structure and openly acknowledged how the class forced him to consider pedagogy in general, noting, “The course specifically made me think a lot about...more than the relay of that content knowledge” (Interview 3). Pete was a proponent of the flipped classroom model and wanted to see more opportunities for students to have choice and collaborate within this space. He was aware of the amount of work necessary for Linda to create learning modules based in the flipped model, and appreciated how it was different to any other class he had experienced thus far.

Participation in the class made Pete consider pedagogy beyond content delivery, which was his focus at the beginning of the class. However, Pete’s focus switched from seeing the teacher as the content expert in the room, to that of technology expert. The class “was all about learning the different types out there that I could possibly get from it,” meaning that for him the class focused his learning on technology tools and how he could use them. This is interesting as Pete was interpreting this new iteration of the educational technology class in the way the old iteration of the class was perceived. He failed to understand how this version of the course was not supposed to be about the tools, but should instead be pedagogically centered, and through instructor modelling, easier for students to understand.

Nevertheless, the class did make Pete consider pedagogy, but through a lens of technological knowledge. Pete described how:

I was always on the train of teaching with technology in the beginning...I don't want to be a teacher who has kids know more than I do...kids will always know more about social media and viral stuff...but when it comes to the tools that we teach with, you never want a student to know more than you about a specific thing. You have already lost the student. They are going to question if what you are teaching them is meaningful, because now at some point they have figured out that you didn't know something that they knew.

(Interview 3)

Pete's position evolved in his time in the class. His main pedagogical concern was not about whether he has adequate content knowledge, and can relay that content to his students, but instead it is whether he has adequate knowledge of technology so that he can stay ahead of his students and seem relevant enough for them to consider him as the classroom expert. In this regard, Pete's participation in the technology class led him to reconsider his potential pedagogy outside of content delivery, but limited consideration to his knowledge of technology tools. This is important because he once again appears to miss the point of the instructor overtly modelling pedagogical practice, instead focusing on the class content and assignments which he considered to be limiting and stifling of his own creativity.

Summary. Overall, participation in the class influenced pedagogical decision-making in two ways. Firstly, by overtly modelling student-centered pedagogies and the flipped classroom, the instructor exposed the participants to practices which they were unfamiliar with. As a result, participants such as Pete and John were influenced enough to consider how they might adapt their instruction around student needs. Although John was dismissive of the model as it did not

conform to his ideal of what teaching should be, while Pete was adamant that it could be done better.

The second way the class influenced decision-making was in its placement in the program sequence. As most of the participants were so inexperienced with education beyond their own K-12 experiences, they found it hard to plan potential instruction without knowing how to first organize a classroom as in George's situation, or even understand what social studies teaching is about as evidenced by Richard's appeal for the technology class to come later.

Students who were entrenched in their reflexive conservatism (Slekar, 1998), such as Paul, found little influence on their potential practice. Paul's reticence obscured his ability to interpret modelling of practice as something he should consider. Moreover, like John, he saw the instructor's modelling of facilitation as a loophole he could exploit so he would not have to work as hard to complete assignments at home. It was good for him, because he could get help in class, but he implied that it was not a rigorous approach to teaching, and I was under the impression that he was unlikely to adopt any of the practices he was exposed to.

Paul's position is echoed by John, who, although he understood Linda's purpose for modeling flipped instruction, was not convinced that it represented strong instruction. Consistent with all the participants was a reticence to move beyond a teacher centered approach to pedagogical decision making, even though they were shown multiple examples of student centered pedagogy in this class.

Challenging Participants' Predispositions

In Chapter Four, I explained how it was the intention of the instructor to use the class to address misconceptions of participants and challenge their apprenticeship of observation. Her plan to use "questions to formatively assess and address misconceptions" was integral to the role

of the class in challenging participants' predispositions (Instructor interview). Consistent with the other findings, each participant was forced to wrestle with their misconceptions to varying levels. As we shall see, some began to change their instructional dispositions, while others remained steadfastly entrenched in their apprenticeship of observation.

John. A clear example of a change in disposition occurred with John. He changed his position on whether instruction should be student-centered or teacher-centered. At the beginning of the class, his original thought was that the teacher would be the center of instruction. This evolved to an understanding that student learning was important and his role as teacher was to facilitate. He cited the Web 2.0 activity as one which helped to change his thinking. Up until this point he had not considered students producing anything other than written papers or tests as a means of assessing their understanding. This, together with the infographic activity, helped John realize there were possibilities that went beyond his own experiences of learning. Similarly, his understanding of the role of classroom teachers changed through participation in the class. Because the instructor overtly modelled a teacher role in which she was "more of a guide...less of a lecturer" (Interview 3), his understanding of what a teacher should do was challenged and expanded.

John began to see how technology can help with student centered instruction. As stated, he credited the Web 2.0 activity as a key learning experience which shaped his understanding. Indeed, when asked about how he might use Web 2.0 in his own instruction, he described how he would use a tool like Audacity in which students can create their own digital stories. His intention would be to create an archive of student-created content, with infographics used as the main tool for students to create explanations to accompany their stories. In referring to his TPACK plans from those activities, John thought his ideas were good, but he was unsure of how

best to scaffold learning so students might be successful at creating products. Effectively, John's predispositions underwent an evolution. He envisioned using Web 2.0 tools to facilitate alternative methods of assessment which are more interesting for students, while himself using technology to enhance his content delivery.

Paul. Paul was the most entrenched of all the participants. So far, I have explained how he described himself as against technology in general, not just in schools. Paul found it hard to learn new tools, and worried about the social effects of the digital divide. His dispositions toward teaching social studies were entrenched and he was steadfast that his job was to make students enthusiastic about learning, to build relationships so they would be as inspired to learn history as he was to teach it. However, even though he was so entrenched in his epistemology, and found it hard to develop a rationale, he did make some small shifts in thinking. For example, in his final interview, Paul outlined how he might be able to "bite the bullet," and use technology to support "group projects, giving them [students] the resources to be able to collaborate...you could have a group of two or more and you can post" (Interview 3). For Paul, this was a massive concession. His experiences with Web 2.0 tools in the class led him to acknowledge that they could play a role in supporting collaboration and group work. This is not just a shift in thinking because he was considering using technology, but it was also significant because he was thinking about instruction which was not centered on his expertise as the teacher.

It was unfortunate, though, that this shift occurred so late in the class as Paul's TPACK plans were not reflective of his new stance. What enactment there was consisted of teacher use of technology to enhance his content delivery. A prime example of this was Paul's favorite task, producing an infographic which he felt would be a good way to convey knowledge to his

struggling learners, instead, he could have students create the infographics to demonstrate their understanding of the content.

Paul's disposition, therefore, also evolved somewhat. He moved from a very traditional, "I'm a paper and pencil guy" (Interview 1), to a slightly more accepting stance on educational technology in his classroom. Although he did not display any movement in his TPACK plans, he did verbalize how important discussion was to learning history, and he expressed that he might use technology tools to facilitate small group instruction. Therefore, although he was a reluctant participant in the class, Paul's dispositions were influenced by the learning activities in the class.

George. Like Paul, George was similarly entrenched in his epistemology. He understood that technology might have a limited role in instruction, however he was convinced that replicating his own learning would work for his students too. Throughout the course, George was a strong advocate of lecture to convey content, followed by whole class discussion, and then a written paper for assessment. By the mid-point of the class, he was still adamant that this was the best way to teach social studies.

Things changed for him toward the end of the class. Constant exposure to student centered approaches to technology integration led him to explain to me how social studies is more about "critical thinking so being able to process information and then coming up with your own thesis" (Interview 3). This was a shift in his definition of social studies and demonstrated a move away from social studies being about learning historical facts. Moreover, George described a constant tension he felt as his beliefs were challenged. He explained,

I know that lecture and papers work for me, but I was aware the whole time that it doesn't work for everybody, and now since then I think learning and being exposed to

these new technologies or lessons, I can better understand how I can fit these into my teaching. (Interview 3)

For me, this was an important finding as it demonstrated how he knew all along that his beliefs and dispositions were not accurate; however, he was resistant to change them until he was exposed to new ideas through participation in the class. He then continued, “A lot of people have to be hands on, especially people with special needs, I think that my style of teaching wouldn’t fully cater to them” (Interview 3). Therefore, through his participation in this class, and likely by learning about students with learning disabilities in the unit on differentiation, George began to realize how his perception of how he wanted to teach social studies did not match the reality of what students needed to learn successfully.

George’s predispositions were influenced mainly by learning about students with disabilities. I have mentioned in previous findings how his engagement with the multimodal resources, along with the activity where he describes a feature of an iPad that can assist students with needs, caused him to reconsider his traditional lecture based approach. However, as with other participants, his changing predispositions were not realized in his class assignments. George, consistent with others, was beginning to understand why he needed to change his epistemology, yet was unable to demonstrate this at the enactment phase.

Richard. As with Paul, Richard’s pedagogical approach underwent a minor change. Consistent with his peers, Richard was an advocate of lecture based instruction of social studies content, and was reluctant to implement technology tools for any use other than a distraction. In his TPACK plans there were glimpses of a shift in approach, for example, he wrote a plan for the Web 2.0 module, where students created collaborative wikibooks as an alternative to writing a

paper for assessment. But this assignment would have happened following traditional lecture and textbook based instruction.

By the end of the class, Richard understood how technology could be leveraged to improve engagement in his future students, yet it was something he talked about with some reluctance. He believed he could use technology to enhance the visuals he might use in lecture, but at no time did he consider how technology might be used to help students learn the content. With that said, he did acknowledge his position on the use of technology was evolving gradually. In his final interview he told me, “I’d say my view was a gradual transition. The more I’ve learned about educational technology, the more I’ve gravitated to it” (Interview 3). From this I can infer that his initial reluctance to include technology in his teaching of social studies was evolving because of his participation in the class.

Nevertheless, as with the others, his enactment of his predispositions should be addressed with caution. Looking at Richard’s responses to the TPACK survey, and corroborating with his first interview, it was apparent that Richard’s wikibook activity, in which students create digital content was one of the rare examples of technology infused instruction he was exposed to as a K-12 student. Therefore, even though he talked about a transition in his predispositions, when he came to demonstrate his potential enactment, he replicated a practice he learned from his apprenticeship of observation. So how far his epistemological shift went, is uncertain.

Pete. Pete provided a different example of how participation in the class challenged predispositions. His initial self-confidence as the more mature member of the class who had thought deeply about his pedagogy was challenged through his class experiences. In his final interview, there was evidence of self-doubt creeping into his thought process. For example, he

appreciated how the TPACK plans helped frame the integration of technology and his teaching, however, he expressed a struggle with writing them:

I'll be like how am I ever going to set up a lesson plan to teach kids what I just learned in a way that kids could understand, because I'm an adult, I can barely understand what I just learned now? (3rd Interview)

In the previous section of this chapter I explained how Pete struggled with the idea that he might not be the expert in a room full of students. His confidence in his ability to plan instruction was shaken through being forced to consider not just how a piece of technology might be used, but also by how that technology would be used to teach a concept. For him, using TPACK plans was an extreme way to challenge teacher candidates to reconsider their approach to pedagogy, and as it challenged his predispositions, it shook his self-confidence:

The course forces you to use technology to figure out what you're going to teach. You're going to use the technology – a piece of technology to teach this no matter what. You're not going to use a textbook. You're not going to use lecture. You're going to specifically use the technology to teach that. So, it's an extreme end of the spectrum (3rd Interview).

Even though participation in the class was felt to be extreme, Pete still made some shifts because of the way the class challenged him. He ended the class with a defined rationale of teaching social studies to improve cultural awareness. He had a definite idea of how technology might enhance learning beyond assisting him as the content expert. He wanted to use Web 2.0 technology to enhance how students might discuss, collaborate, and share ideas, therefore teaching in a more student-centered manner. Pete was already breaking away from his own

school biography, and participation in the educational technology class helped him to conceptualize how this might occur.

Summary. As I posited in Chapter Two, challenging preconceptions is a key role of teacher educators. Through participation in this class, participants' preconceptions and beliefs were challenged to varying degrees, and their understanding of teaching social studies with technology deepened as a result. However, there were marked differences in the level of enactment by the participants. For example, Pete and John were by far the participants whose preconceptions were challenged the most, yet they would struggle to demonstrate their potential enactment in their plans. It was only through our interviews, and discussions about their TPACK plans, that I could gain insight into how far they had been challenged to change. Likewise, George expressed how he was always uncertain about his instructional approach, even though he was so adamant about it in the early interviews. Participation and exposure to student centered pedagogy had a profound effect on his pedagogical thinking, though this was only made apparent in the final interview.

Even the most entrenched participant, Paul, was challenged by the technology enough to realize that it had limited uses for him. I noted in previous findings how Paul seemed oblivious to the pedagogical modelling carried out by the instructor throughout the class. Indeed, only Pete and John seemed to be influenced by the instructor's actions enough to consider how they might change their teaching. This may be due to their maturity and higher level of exposure to classroom practices when compared to their peers. Or it may be that they were more open-minded to change, and less reflexively conservative in outlook. Nevertheless, for all the participants, exposure to student-centered technology integration challenged their dispositions. For some it affected how they might teach social studies, shifting them to a more student-

centered approach. For others it changed how they saw the integration of technology in their instruction, with a more accepting and positive attitude to using technology as a tool to help them to teach social studies. Nevertheless, for all participants class participation helped them to experience and articulate evolving predispositions. Although they struggled to demonstrate how their predispositions had evolved in the enactment phase, they each articulated a change in their understanding of how they were going to teach social studies in the future.

Chapter Summary

As I show in this Chapter, participation in an educational technology class challenged participants' in four key areas: Their evolving understanding of TPACK, how their rationales and vision developed; their general pedagogical decision-making; and their predispositions about teaching. Although the effect of course participation was more profound in two of the participants, there were examples of the other three undergoing elements of change and tension as they progressed in the class. Although this study demonstrates how this technology class could challenge beliefs about TPACK, and participants preconceptions about pedagogy, along with the creating the beginning of burgeoning rationales and visions toward social studies teaching and learning, it is hard to ascertain the extent to which participation in the class made any lasting effect.

In the next and final chapter, Chapter Six, I will discuss the research question alongside these findings. The extent of lasting change to prior beliefs, preconceptions and dispositions will be discussed. I will also evaluate the findings in relation to the literature, particularly the extent to which this study deepens our understanding of how teacher candidates learn TPACK. Other significant issues for discussion arising from the study, such as the placement of the class in the overall course structure, and implications about where TPACK is best learned (in a standalone

technology class, or embedded within content methods) will also be addressed. Finally, I will also discuss other avenues for further research as well as recommendations for future actions regarding the learning of preservice secondary social studies teachers.

CHAPTER 6

Discussion

In Chapter One I outlined some of the perceived problems with teacher education. Teacher candidates, it was argued, are burdened by twelve years of experience as learners in K-12 which leaves them ill-prepared for the complexity of teaching (Lortie, 2002). They are poorly prepared through participation in courses lacking consistency in programs undervalued by students and teachers (Darling-Hammond, 2006; Tom, 1997). Moreover, teacher education in university based settings are often perceived as too theoretical to be of practical use creating a gap between what is learned at the university level, and what is taught in schools (Labaree, 2004). Thus, teacher education programs and teacher educators must look at ways of bridging the gap between theory and practice, whether this be using reflective practices (Zeichner, 2008), or through the development of vision or rationale in student teachers (Darling-Hammond, et al., 2005). The coupling of theory and practice, termed by Kennedy (1999) as the problem of enactment is particularly relevant in social studies, where competing ideologies, combined with the effects of standardization, leads to a teacher education focus on skill application over pedagogical decision making (Adler, 2008). This study focused on issues of enactment by examining how secondary social studies teacher candidates' pedagogical decision-making was influenced by their participation in an educational technology class.

In this chapter I will discuss the implication of the findings. I will begin with an overview of the findings to provide context for the ongoing discussion. I will then describe implications for teacher educators by examining how the findings relate to aspects of the literature, beginning with what the findings show in relation to general issues of teacher education and teacher candidate learning. From there I will focus on the role of the class in challenging issues of

teacher belief, and the extent that rationale was developed. Then I will address the major component and focus of our theoretical framework, discussing how this study related to teacher candidate's learning of TPACK and enactment of social studies pedagogy. Following this, more general implications pertinent for teacher education programs are discussed. These include issues surrounding the class's placement in the course structure, the relevance of the class content to the needs of a teacher education program, and an evaluation of the instructor's analysis of the course. I will then briefly address limitations of this study, outline future directions by investigating issues of where TPACK is best learned, how rationale and vision play a role, where course structure might be further considered, and outlining alternative models for achieving these aims. After recommendations for future research are made, I conclude the study by placing these in the context of school, teacher candidate, and teacher educator needs. However, before I can discuss any of these issues for discussion, we need to address implications arising from the findings. To do so, I begin with a general overview of the findings.

Implications

Implications for Designers of Educational Technology Courses

In Chapter Three I explained how I analyzed the data. From the analysis of data, four key findings were established: (1) Evolving Understanding of TPACK; (2) Developing Rationale and Vision; (3) Influencing Pedagogical Decision-making; and (4) Challenging Predispositions. In summary, it should be noted that as participants progressed through the class, certain modules and assignments influenced their understanding of the different aspects of TPACK. As participants were expected to show how they might enact technology infused lessons by creating a TPACK plan, outlining how they might implement learning using technology, participants were forced to consider their pedagogy. This was a key feature of the new iteration of the

technology class which made it distinct from previous versions. As a result, participants were exposed to concepts such as student-centered instruction, assessment of student created products, and student collaboration, for the first time in their experience. Through completion of two TPACK surveys, and participation in three semi-structured interviews, participants expressed consensus that their thoughts about teaching were shifting to a less teacher-centered and more student-centered approach. However, when thinking about the enactment of social studies instruction, they tended to rely on technological tools to deliver content to students, rather than have students use tools to enhance their social studies skills.

Likewise, participants' understandings of technology integration were deepened by participation in the course. Most participants' experiences of technology integration in social studies was limited to the use of PowerPoint to help their teachers lecture. Their class experiences helped them to see how technology provided tools to help social studies teachers improve content delivery. Through participation in the class, participants were generally impressed by the potential of Web 2.0 tools to aid collaboration, but did not express any desire to incorporate these aspects into their future instruction. Likewise, the class forced participants to examine state standards and consider how they might be taught in the context of TPACK. For them this was their first experience of working with standards and some felt that it limited what they could do pedagogically. As a result, although class participation made participants think about social studies content, their knowledge of how to convey it to students remained at a similar level to where it was at the outset of the class.

Although not an overt aim of the class, there was some evidence that the participants developed their vision for what their teaching might look like, and in the case of Pete, a burgeoning rationale for social studies instruction. Several participants expressed an aim in their

instruction toward developing critical thinking in their social studies students. John expressed a desire to do this by playing interactive games and making the content more entertaining. John decided that there was a benefit to having social studies students go beyond writing papers, and to do this end he would have to teach beyond the standards and have students create products using Web 2.0 technology tools. However, at this stage in his development, he was unsure how that would be enacted. Pete fully realized that he wanted to teach for cultural awareness, but like John, he was yet to work out how this would be achieved. By aiming to challenge teacher candidates' prior experiences with technology, this class did develop some consideration of rationale in the participants.

Through constant modelling of student-centered instruction, particularly using the flipped classroom model, the instructor challenged the participants to consider their pedagogical decision making. Indeed, in their TPACK plans, participants had to justify why they chose certain tools, and why they wanted students to produce certain products. As with the other findings, this was the first time that the participants were required to do this, and so it is no surprise that they expressed a shift in their thinking. In general, the participants were keen at the beginning of the class to fall back on their own experiences as K-12 students and replicate instruction that they received. However, as they were not able to use what they often defined as a lecture, test, paper model of instruction, they were forced to consider other pedagogical choices. Although encouraging for their future development, as I described in Chapter Five, they continued to express a desire to use teacher centered, lecture-based, social studies instruction, relying on technology tools to improve engagement and relevancy.

Finally, the instructors' intention to challenge misconceptions throughout the class had some effect on the participants' predispositions. For example, John shifted his viewpoint to

acknowledge that instruction should be student centered, mainly because of his experiences with the flipped model and formative assessment practices. Through his class participation, he was exposed to a model where the teacher acted a guide, not a lecturer. Therefore, he could redefine his preconception of the teachers' role. For Pete, his preconceptions of his expertise with content and technology were challenged when he struggled to successfully devise TPACK plans. He realized that he would have to rethink how he would use technology to plan instruction, particularly if he wanted to enact his rationale. For the other participants, their initial skepticism about the role of technology in social studies instruction was challenged as they could incorporate tools in their planning. However, their predisposition toward enacting a teacher centered, content delivery, lecture based pedagogy did not change from participation in the class. Their positions were challenged, but they did not fundamentally shift in the enactment of their pedagogy.

Implications for Teacher Educators

By far the biggest implications are for teacher educators. In this case study I could examine in detail not only what teacher candidate learning looked like, but I was also able to investigate the motivations and pedagogical decisions made by the class instructor. For example, it was her intent throughout to model student-centered practice to the class, and where possible to make that practice explicit. She also expressed an intention to challenge teacher candidate's misconceptions about teaching with technology, thereby affecting their beliefs, while infusing TPACK as a model for them to use to consider their enactment. These practices, along with the participant's rationale development all contain implications for teacher educators to consider in their own practice.

Modelling pedagogy. Modelling practice is an important aspect to enhancing teacher candidate's learning about teaching and learning (Loughran, 1995). Linda's intention to challenge participants' apprenticeship of observation was consistent with researchers, such as Loughran, mentioned in Chapter Two. In that chapter I explained how the messy construct of teacher beliefs are best challenged and formed in colleges and universities (Roth, 1999), and it was the role of teacher educators to clear up misconceptions about teaching. As such, the class provided a strong example of a process which both challenges and supports teachers as they address their changing practices and perceptions (Rodgers & Scott, 2008). By exposing the participants to a flipped instruction model, the class directly challenged their preconception of teaching social studies as job of teacher centered-content delivery. Moreover, by modelling flipped instruction, modelling how to use formative assessment, and demonstrating a student-centered approach to instruction, the class instructor showed how teacher candidates might embrace more constructivist pedagogical orientations. In this study, the instructor followed Tom's (1997) definition of constructivism which fostered learning that was personally meaningful, "and intellectually complex" (p. 78).

It was stated in the literature review that one challenge for teacher educators was to balance the need to teach in a manner respectful of the course content, while at the same time modelling constructivist practices (Richardson, 1997). In placing an emphasis on educational themes over the use of technological tools, the class emphasized that the technology tools on their own were not important for good instruction, how teachers use them is. At the same time, participants were given choice in what technology tools they used and how they demonstrated their learning. This provided another example of how the class instructor attempted to model a student-centered pedagogy.

But how did modelling pedagogy impact the learning of the participants? In Chapter Five I described how the participants were influenced heavily by learning through the flipped instruction model. Most notable were John and Pete who commented on how the flipped model of instruction forced them to think about how content should be delivered to students, and that the teacher should not always be at the center of instruction. As a result, Paul commented about reaching an understanding of how “traditional methods of teaching do a disservice to the students” (Interview 2), even though he remained steadfast about how social studies instruction was all about how well teachers could tell interesting historical stories. Similarly, George expressed how the structure of the class and method of delivery was an influence on his practice in the future. He appreciated the transparency of the class, in that everything was prepared in advance and students were at the center of each assignment. George noted, “It made me think about preparing ahead” (Interview 3). He expressed how he now had to think twice about what it means to meet objectives. Yet, consistent with the other participants, he understood and appreciated the value of modelling pedagogy by the instructor, but he was still unlikely to use these strategies in his future instruction. For him, the class influenced his thinking about instruction, but when asked if it would change his ideas about teaching, particularly social studies, George responded that there were “no profound changes” to his pedagogical approach (Interview 3).

This case study, therefore, demonstrated that it is possible to balance the need to model pedagogy with the need to deliver content to teacher candidates in a space such as the educational technology class. However, even though the participants in this study understood the purpose and potential for modelling practices such as flipped instruction, student choice, and formative assessment, their appreciation of it only went so far. In all cases, there was a

reluctance to modify their own pedagogical approaches to teaching social studies. This is likely because the participants were inexperienced in social studies pedagogy, even though they reported in the surveys that they believed they were. Moreover, this is compounded by the nature of the class itself, serving a general education audience, with no guarantee of being taught by a social studies content expert. This largely explains why even those examples of a small shift to student-centered instruction, as shown in the previous chapter, were either not demonstrated in their potential enactment on their TPACK plans, or were refuted when participants were challenged with describing how they might teach their own classes in the future. Therefore, although it was the explicit intent of the class instructor to challenge misconceptions in her students, the long-term impact of the challenge was not necessarily realized. In this study, the role of the teacher educator was crucial in modelling pedagogy with the intent to change misconceptions about pedagogy, however, there seemed to be little influence on the participants' intended enactment. Nevertheless, modelling pedagogy did go some way to challenging belief.

Challenging belief. In Chapter Two I broke down the concept of belief into three stages. Preconception, belief, and disposition. Both Adler (2008) and Zeichner (2005) called for more research into the connection of teacher belief and content delivery, and the complex relationship between how teacher candidates learn to teach and how they enact their beliefs. In this study, I examined the extent to which an educational technology class could challenge and even change teacher candidates' preconceptions, beliefs, and dispositions toward TPACK in social studies. In each area, their stance was challenged but with limited effect. In this section I will explain the extent to which belief was challenged in each stage.

Changing preconceptions. As explained by Hammerness et al. (2005), before examining belief it is important to gain understanding of where a teacher's beliefs originated. Thoughts and

ideas which came first are referred to as preconceptions. In their initial interviews, each participant related the extent to which their apprenticeship of observation was shaped by their K-12 experiences. In general, participants had limited experience with technology use in schools other than as a tool to deliver content by teachers. When they used computers as K-12 students it was often for writing term papers or conducting internet-based research. Their preconceptions about technology aligned with their notion that teaching was principally a teacher-centered mode of content delivery. Their pedagogical approach centered on how they would convey social studies content to students, often desiring to replicate the practices they were good at when they were students. In this way John, Paul, George and Richard all expressed how they wanted to be engaging story tellers like their favorite history teachers. They felt they could connect with students if the content was interesting, and they would do this by supplementing lecture with audio-visuals provided by the latest technology. Students would be assessed by writing papers and taking tests. After all, this is what worked for them. On the other hand, Pete valued collaboration. He excelled at working in groups and wanted this to be the basis for his pedagogical stance. However, he too was good at papers, loved interesting lectures, and felt technology could be used to wow students through excellent audio-visual presentations. At the outset of the class, all participants felt they needed to replicate their K-12 experiences to be successful teachers.

Class participation did challenge preconceptions about both technology and pedagogy. For all participants, how their K-12 experiences of what it means to teach became less important as they progressed through the syllabus. When interviewed, expressions of pedagogical practice shifted away from teacher centered to a more student-centered approach. However, participants still chose to fall back upon their preconceptions of pedagogy when challenged to describe their

future practice. This is consistent with Slekar's (1998) notion of "reflexive conservatism" in which teacher candidates default their practice to one which matches their K-12 experiences, referred to by Britzman (1983) as school biography. For example, John and Richard both advocated for teacher-centered practices consisting of lecture for content delivery, assessed through the writing of papers and taking of tests. By the end of the class, their preconceptions had been challenged through participation in a flipped model of instruction, and being assessed by various performance tasks, yet, according to Richard, "I still think there is a place for lecture and writing papers. I'm not going to give that up" (Interview 3). This is interesting as his tone acknowledged a need to shift away from this pedagogical stance; however, he still maintained his preconceptions of practice merited inclusion in his future enactment. Therefore, it is reasonable to infer that participants' preconceptions were challenged by participation in the class. However, they were not challenged enough to significantly change their pedagogical stances.

Changing beliefs. Along with participants' preconceptions, their beliefs were challenged as they participated in class activities. As I explained in Chapter Two, beliefs are informed by preconceptions, and when associated with various educational issues such as socio-political stances, they influence action (Roth, 1999). As the participants were future social studies teachers, it was important to ascertain what these beliefs were at the outset of the class or even if they existed at all. After all, as implied in Chapter Two, it is beliefs which inform the development of rationale, and the development of rationale or vision is vital for high quality teacher education.

For the participants in this study, their beliefs, held within a sociopolitical context, were not well established. A common theme throughout was that they believed social studies to be

important, and they believed that students should be able to think critically for themselves. However, as Paul explained to me, “History is important so that we don’t make the same mistakes” (Interview 1). This articulation does not reflect a critical thinking mindset. Instead, it supports a knowledge transmission model of instruction. Thus, even though the participants claimed students should be independent critical thinkers, their enactment did not reflect this. Throughout the class, participants were wary of doing anything deemed too political or controversial in their examples. Participants felt it was safer if they had oversight of what was learned as they were the content experts. As they had little knowledge of pedagogy apart from the desire to replicate their experiences as K-12 students, every aspect of the class was a challenge for them in this regard.

Furthermore, there was little evidence in their planning, or in their later interviews of a shift to embrace a socio-political stance that could inform their pedagogy. As with their preconceptions, they adopted a position of reflexive conservatism with beliefs, falling back on what they thought their teachers did with and for them as a model for future actions. As a result, even on issues such as digital citizenship, every participant chose to use the activity to inform future students about how to be digital citizens, thus ensuring that they would be exposed to the correct information. It did not occur to any participant that their students could inform others about what it meant to be a digital citizen.

Changing dispositions. In Chapter Two, I explained how dispositions are derived from teacher beliefs. Dispositions are largely attitudinal, so a teacher candidates’ understanding of how students learn are rooted in their disposition. Disposition provides insight into how instruction may be enacted. For the participants in this study, their dispositions were rooted in their K-12 experiences. As already stated, participants had not yet formulated any clear beliefs,

and as the next section will explain, they lacked a clearly defined rationale. As a result, disposition, through enactment, was barely challenged.

Through participation in the class, participants were expected to consider their enactment through the completion of TPACK plans. As Pete observed, they sometimes felt forced to think a certain way to complete the plans. He called it “extreme” in that it challenged him to reconsider his future teaching through the constraints of the framework. Richard acknowledged how this helped reframe his thinking, while John expressed how using the framework forced him to go beyond the lecture, paper, and test model he was so familiar with. However, even though the participants expressed during interviews how the class made them reconsider their pedagogical approach, when they were challenged to describe how they would teach, they described lessons that were still teacher-centered, and focused on content delivery. The only consistent shift in disposition was in their use of technology to deliver the content. Both Paul and George agreed that using technology to deliver content might be more engaging for students, and this was important to their future pedagogy. However, the over-riding concern for all participants was the desire to maintain expert status in the classroom. Pete, who was generally the most student-centered in his approach, expressed concern that he had to know more than the students, especially about how to use technological tools.

Participation in the class, therefore, certainly challenged participants’ preconceptions, somewhat helped to define their beliefs, and began to shift their dispositions, but it did not create a tangible change in their understanding of TPACK. Participants felt their understanding of technology for teaching was improved, but they were reluctant to use it for anything other than teacher-centered content delivery. They were keen to continue to replicate a pedagogical stance constructed through their apprenticeship of observation. Their disposition was to be not only the

expert in the room, but to replicate the inspirational teachers they had as students. For them, it meant that social studies content had to be as interesting to their students as it was to them. Paul's experience provides the best context for this analysis. When asked about why he liked certain teachers, he described the teacher who would dress up in period costume and tell interesting stories as his inspiration. A teacher's passion for content mattered more to the participants before they participated in the class, and it was still a major factor at the conclusion. As participants' beliefs were challenged but not changed, so their rationale development was also limited.

Rationale development. In the review of the literature in Chapter Two, I made an argument for the development of reflective practices to promote vision or rationale in teacher education programs. In social studies, attempts to challenge preservice teacher belief left researchers despairing that participants focused on content knowledge over pedagogy (Crowe et al., 2012). Reflective conservatism was only challenged when instructors overtly set out to challenge certain preconceptions (e.g. James, 2008, 2010), or when teacher candidates were tasked to define their rationale for teaching social studies (e.g. Hawley & Jordan, 2014).

The Educational Technology class in this study did not overtly address preservice teacher rationale development as suggested by Hawley and Jordan (2014), nor did the instructor specifically challenge predetermined preconceptions as suggested by James (2008, 2010). In fact, there was no explicit reference to defining or developing rationale in the class documentation. Nevertheless, participants did consider rationale development because of class participation. For example, in the initial interviews, every participant struggled to explain a vision or rationale for their instruction. Most participants, (Paul, George, and Richard) enjoyed history as a subject and felt that it was important for students to know the stories that shaped their past. Paul's initial

statement was the oft quoted “Those that do not learn from history are doomed to repeat it” (Interview 1), which is not a rationale statement as much as a reason for learning historical facts. When challenged to explain what he meant in further detail, he could not expand upon this quote. Pete, on the other hand, knew he wanted to instill a sense of cultural awareness in his students, and he knew technology could help him somehow. But he was unsure about how that might happen.

As participation in the class progressed, some participants could use in-class experiences to derive a rudimentary purpose for their instruction. Through their consideration of TPACK, and by writing TPACK lesson plans, participants could articulate burgeoning rationale statements. For example, John’s realization that students could show their learning through media other than writing papers became a reflection of his shift to a more student-centered approach to social studies instruction. Similarly, after the course, George could articulate a desire for his students to learn to be critical thinkers, and how his future instruction would take this into consideration. Conversely, Richard’s rationale was unchanged. He wanted students to know about the past, and technology might play a role in helping them to plug gaps in their knowledge.

Thus, although it was not a class objective to influence rationale development, this study demonstrates how overtly challenging preservice teacher beliefs can help participants consider their rationales. However, it should be noted the extent to which this phenomenon is directly attributable to class participation is questionable. At no point in the course were students tasked with defining their teaching rationales, or their rationales toward technology integration, or even their vision for what their content delivery might look like. As it was the intention of the instructor to challenge preconceptions, any one of these definitions made at the outset of the class would have served as a baseline for developing, and challenging teacher candidate

preconceptions. In seeking to adopt rationale-based practices, I would recommend that classes like this educational technology class be constructed to incorporate rationale based practices into the formal class structure, through opportunities for discussion or reflection. For example, as participants overtly considered TPACK, they also subversively considered their rationales. However, they were not afforded a formal class space in which to articulate their developing understanding of purpose. Nor were participants challenged to critique their ontological stance regarding technology integration. I posit that by providing opportunities for students to describe their purpose, it becomes more likely that beliefs may be more successfully challenged, leading to a more profound pedagogical shift away from the apprentice of observation by participants. A class such as the one in this study might have a more meaningful impact on teacher candidate learning than it already does.

Even though it was not the intention of this course to develop an understanding of rationale in the participants, they further developed their visions for instruction and accompanying purposes for action. The use of TPACK plans, and the framework as a focus for instruction throughout the class has positive implications for teacher educators to consider also.

Class consideration of rationale. Although a key finding of this study was participant development of a burgeoning rationale toward their use of technology in their future teaching of social studies, it was not overtly addressed by the course. As I explained in the previous section, at no point in the course were participants tasked with framing their pedagogical stance, or considering their approach to technology integration. Participants were not expected to consider their purpose or rationale for teaching their discipline. So how could the participants of this study coherently define their burgeoning rationales?

It should be noted how inexperienced the participants were as future teachers. In fact, in their initial interviews, when asked to frame their rationales, and when asked what they taught social studies for, it was almost impossible for participants to answer the question at all. This was to be expected as up to this point they had not formally considered their own rationales for teaching. As I reported in Chapter Five, as they were exposed to different purposes for teaching with technology, for example to improve accessibility, or to enhance student collaboration or creativity, so their understanding of purpose for teaching social studies was enhanced also. Therefore, by the end of the class, each participant had a better, although still limited, conception of what this meant in terms of their future teaching. For Paul, George and Richard, they struggled to go beyond teaching social studies because the content was important to know and interesting, although they acknowledged social studies' value in creating critical thinkers out of their students. Pete and John had better defined purposes which spoke to one of the themes of social studies.

Overall this study demonstrated how studies teacher candidates can consider their understanding of TPACK in a standalone educational technology class. However, the class must be one that is framed around TPACK and that overtly considers pedagogy and content above the teacher candidates' ability to use technology tools. Moreover, as this section implies, if the class can add opportunities for students to consider their developing rationales for teaching their content, teacher candidates may go even further in challenging preconceptions, beliefs, and dispositions. Therefore, it is my recommendation that future iterations of educational technology courses also create opportunities for teacher candidates to develop their rationales for teaching.

Understanding TPACK. The primary focus of this study was to investigate how preservice secondary social studies teachers learned TPACK through participation in an

educational technology class. As I reviewed in Chapter Two, TPACK provides a framework within which educators can consider their pedagogical practice, aiming to thoughtfully interweave “all three key sources of knowledge” (Mishra & Koehler, 2006, p. 1029). Although critiqued as over simplistic and vague (Brantley-Dias & Ertmer, 2013), when instruction is founded on the question, “Why do I want to use this technology?” (Nelson, Christopher, & Mims, 2009, p. 82), teachers can make more meaningful decisions about instruction. In this context, the objectives of the class supported current literature.

As reported in the findings, participants’ understanding of TPACK did grow because of their experiences in the class. As Pete repeatedly pointed out, they were forced to think about teaching using technology, and completing instructional plans based on the TPACK framework ensured participants consider content delivery alongside technology and pedagogy. In this area, the class was successful. In their initial interviews, participants explained how their experiences of TPACK in their school biographies were limited to some internet research at best, or exposure to teacher-centered presentations at worst. So, by forcing participants to consider their teaching in terms of TPACK their understanding was naturally developed. I will examine this through each of the main aspects of TPACK in turn, beginning with how participants developed their understanding of technological knowledge.

Understanding technological knowledge. Perhaps the best example of how a participant developed their understanding of technological knowledge was John. At the beginning of the course he was interested in how technology might be used to break down the barriers between teachers and students. His focus was on how technology might enhance content delivery, as his experience had been in classrooms in which instructional technology was used to add visuals to lectures and for students to type up their papers. However, by his second interview, John could

distinguish his pedagogy as different to that of his K-12 teachers. In comparing established teachers' views of technology to his own he stated:

I think a lot of the more veteran teachers, they are still a little more resistant to the technology because they kind of see it as a toy. These things are not toys, they are tools...I don't see them (students) going to computer labs anymore, because every subject is like a computer class. It's like I'm not sure if they have a computer. It's going to be like this, all this technology, so yeah, I'll definitely come up with ways to incorporate that." (Interview 2)

John's class experiences shifted his understanding from what he was led to believe as a K-12 student which originally was technology was toy, not a tool. This made him more aware of how technology should be incorporated into his instruction. As I described in Chapter 5, John was impressed by the potential of Web 2.0 tools; however, he viewed them as supplements to his teacher centered approach to pedagogy. Although John showed the greatest shift in terms of his understanding of technological knowledge, consistent with the other participants, John's understanding of technology for use in the classroom improved due to participation in the class. Nevertheless, it had limited impact in his pedagogical practice and future enactment.

Understanding pedagogy. Consistent with Slekar's (1998) notion of reflexive conservatism, the participants in this study displayed a tendency to default to practices consistent with their K-12 experiences. A typical example of this was George, who felt participation in the course made him more confident about choosing technological tools. Still, he was not convinced about how the tools might change social studies teaching. He had a dislike of collaborative learning that was informed by his school experiences and participation in the class did not change that impression. Indeed, he openly stated that there was no place for a tool like video chat

in the social studies classroom. When questioned about whether his vision for how his teaching might have changed, he stated:

I don't think it moved me away so much, but I can see in a high school setting doing just activities to break up lecture and stuff, so I still haven't found something that's going to revolutionize the teaching of social studies in a classroom setting. (Interview 3)

For George, participation in the class taught him about technological tools, but did not help him to better understand pedagogy. He defaulted to what he already knew and was familiar with. Moreover, when asked what aspect of the class he might implement, he expressed how he liked learning about the interactive white board and could see that tool as an aid to lecture in the future.

It is possible his state of pedagogical inertia comes down to inexperience with educational theory and the actual practice of thinking about teaching. Participants such as George, Paul and Richard, who had little to no experience of teaching outside of their apprenticeship of observation, were reluctant to shift their pedagogical stance and claimed they learned little about social studies teaching from the class. John, on the other hand, could begin to see some value in teaching social studies from a student-centered perspective. For example, he described how students might be able to create oral stories and reports using Web 2.0 tools, and with laptops they can be creative in how they show their learning. However, even in his planning, he was reluctant to move away from a teacher-centered content delivery model, instead, using technology to replace the writing of papers for assessment, to something more “creative and interesting” for the students. Participants like John and Pete already had some pedagogical experience, and so their pedagogical stance was challenged by the class. However, they too remained teacher-centered in their outlook.

Understanding content. The class was not designed to address content knowledge specifically; however, participants had to become familiar with state standards in their content areas when completing TPACK plans. As already shown in Chapter Five, participants felt strongly that they were content experts, and their experiences as K-12 students already prepared them to deliver content to students. Every participant expressed a love for social studies, especially history. As I described in Chapter Four, Paul is an embodiment of this view. He had a love of American and military history through his relationship with his father. This love of the content drove most of his pedagogical decision-making. He wanted that love of content to filter to his students somehow. By the midway point of the class, he expressed the focus of his content should be skills-based, with students improving their critical thinking. His view was echoed by George and Richard, who felt the most important purpose of social studies was to enable students to critically think. This perspective was a change in how they thought about social studies content. Paul stated he wanted students to “critically think, learn to write properly, and have access to primary sources, not just a textbook” (Interview 2). Paul’s change in his description of what is important in social studies is an example of how his experiences of the technology class developed his understanding of how to teach social studies.

Similarly, George also began to value critical thinking as a component of social studies. Toward the end of the course, he envisioned how he might use lecture and discussion to engage his students to think critically about the content:

I’d probably give a base lecture to lay down the foundation of what’s going on...I think discussion is important for critical thinking skills...listening to other people...being able to argue your point...I think debating is...and talking is...talking things through with other people was a great way to develop critical thinking.” (Interview 3)

For both George and Paul, participation in the class led them to consider social studies content through a different lens. Rather than focus on the importance of learning content because they are passionate about it, they acknowledged the importance of teaching students how to develop social studies skills. Although their understanding is nebulous at this stage, after all, they are yet to participate in a methods class, they are good examples of how thinking about TPACK can influence their understanding of content knowledge. Even though it was not a course objective or clear intention to develop an overt understanding of content, participation in the course caused participants to perceive social studies in a way that was different to their original preconceptions.

Traditionally, social studies methods classes are considered the ideal space in which preservice teacher beliefs can be challenged (e.g. Hawley et al., 2012; James 2008; 2010; Pryor, 2006; Slekar 1998), and spaces in which their understanding of content may be enhanced (e.g. Crowe et al., 2006, Doppen 2007, Salinas et al., 2011). However, this study challenges this stance by demonstrating how participants' understanding of content was challenged and changed somewhat, even though there was no overt intention by the class instructor to do so.

Participant learning of TPACK. In Chapter Two, I described how social studies researchers posit social studies methods classes as the best place to learn content specific technology integration (e.g. Brush & Saye, 2009). This viewpoint was supported by Hofer and Swan (2014) who implied that the best place for the learning of TPACK is in methods classes. They called for methods instructors to take care to unpack their practice and be overt in their use of the TPACK framework in their social studies methods instruction. However, there is a problematic assumption that methods instructors are comfortable with the technological knowledge component of TPACK enough to facilitate this learning. Moreover, the time it takes to unpack practices concerned with the TPACK framework may be at the expense of other

important aspects of social studies instruction, such as teaching for important concepts such as social justice. Likewise, researchers such as James (2008) and Slekar (1998) posit that methods classes have an impossible task in challenging preconceptions about social studies pedagogy. Therefore, as social studies methods classes are already complex and challenging learning environments, contrary to arguments made by researchers such as Hofer and Swan (2014), they may not be the best spaces for teacher candidates to learn TPACK.

This study goes some way to challenge those assumptions made by researchers in Chapter Two. From this study, I argue that a standalone technology course that adopts a focus on TPACK, and through the encouragement of instructional planning around the TPACK framework, teacher candidates learn to better understand TPACK. This is achieved by departing from the traditional focus on how teachers use technological tools. The class design increased the importance of pedagogical and content knowledge and for the participants as this was the first time they had to consider their possible pedagogical approach to content delivery. By doing so, their understanding of all aspects of the TPACK framework was enhanced, while at the same time, their preconceptions were challenged. Therefore, the findings of this study offer a challenge to much of the existing social studies research on educational technology and posit that a standalone educational technology class can help preservice social studies teachers learn about aspects of TPACK and at the same time consider their existing beliefs. Although in this study, participants often defaulted to a state of reflexive conservatism in their enactment, they at least could consider how the interplay of technological, pedagogical, and content knowledge was an important part of their design for social studies instruction.

Participant learning of social studies pedagogy. Similarly, I described in Chapter Two how scholars such as Doolittle and Hicks (2003) stated that good social studies teaching involved

the facilitation of inquiry, real world relevance, fostered local and global interaction, and built on students' prior knowledge and interests. They posited that quality use of instructional technology facilitated good social studies instruction. Likewise, Swan and Hofer (2008) argued for more research on preservice teacher belief about technology integration in social studies as they claimed preservice social studies teachers were not able to effectively integrate technology into their instruction. Adler (2008) claimed that methods classes were the best place for beliefs and preconceptions to be challenged, and the best forum for preservice teacher to learn about technology integration. Indeed, the position of CUFA on the matter was evident in their 2000 guidelines. From this stance, it would be easy to infer that standalone technology classes such as the one under investigation have little to contribute to the content specific learning of preservice social studies teachers. However, this class adopted the approach recommended by Brush and Saye (2009), by focusing on authentic teaching and learning experiences while moving away from an emphasis on pure technological skills. By focusing the course around the TPACK framework, this class introduced participants to standards-based content. They were encouraged to root their technology integration around pedagogical problems centered on the standards. Subsequently participants had to consider how they would enact social studies instruction using technology in a way that went beyond their understanding of technological tools.

It should be noted, however, that the class did not specifically address concepts, ideas, and themes of social studies instruction. It was never intended to. But participation did result in a slight shift in understanding of social studies teaching and learning from a teacher-centered, knowledge transmission model, to a less teacher-centered model in which students use technology to demonstrate their understanding, or help them with accessing content. It is not a radical shift, but it is a starting point that can be enhanced once students enter the program and

take their methods class. Therefore, although Brush and Saye's (2009) content specific stance is largely maintained, this study does show how preservice secondary social studies teachers can begin to learn to teach social studies through participation in a standalone educational technology class, if the class makes good use of the TPACK framework. Participants still defaulted to their own experiences when crafting TPACK plans, yet interviews failed to support the products produced by participants. When interviewed, they showed their understanding of what it meant to teach, and how to teach social studies, had evolved from their stance at the beginning of the class. However, this was still missing in the enactment phase. TPACK lesson plans were focused on how students might use technology to demonstrate their learning, as in George's example of students' creation of a wikibook to show their understanding after they acquired content knowledge from a lecture and discussion. Even Pete, who imagined his instruction as progressive because he valued discussion, could not demonstrate learning beyond a knowledge transmission model.

Therefore, because the participants in this study were unable to demonstrate a shift in enactment to match their dispositions, I suggest that teacher educators be mindful that a standalone technology class cannot and should not replace quality methods instruction. I do contend that in challenging the participants to consider using technology to support instruction in this context, meant the class provided a foundation from which methods classes might build content specific pedagogy.

Implications for Teacher Education Programs

As demonstrated thus far, through participation in a standalone preservice secondary social studies class, teacher candidates can have their preconceptions, beliefs, and dispositions challenged. However, participants remained unable to demonstrate their evolving understanding

in the enactment phase. By using the TPACK framework as an instructional design model, Linda tasked participants to consider how instructional technology could be used to solve problems of pedagogy and integrate with content. Generally, participants demonstrated “reflexive conservatism” in their TPACK plans but in their interviews, they showed their understanding of TPACK, their pedagogical stances, and purposes for teaching social studies were beginning to shift. Although this does not imply that content specific TPACK can be learned in a standalone technology class alone it is important to note how the approach taken by the class instructor to model effective student-centered pedagogy, as well as an overt focus on participants’ ability to think about how technology is used to move instruction to the center of the TPACK model, and thus go beyond merely engaging students or delivering content with technological tools, challenged participants’ existing, albeit minimal, pedagogical stance.

The apparent disconnection between participants shifting dispositions toward a more student-centered pedagogy, and a reticence to construct plans which go beyond replication of knowledge transmission has implications for teacher educators and course designers. Perhaps the most important is the implication for those who are responsible for overall design of teacher education programs, and faculty responsible for deciding where classes should be placed within a licensure course. I will discuss the following areas of interest for programs of teacher education to consider: beginning with the placement of the educational technology class in the education program, then discussing the relevance of class content to teacher candidates, and finishing with the instructor’s analysis of the class which is worthy of discussion in this section as it raises implications for programmatic consideration.

Class placement in the education program. As I explained in Chapter Four, it is worth remembering this class is usually the first or second education class participants take in the

context of their program. As such, the only experience they could consider was their own learning as a K-12 student or initial field observations conducted during the other prerequisite course. John and Pete had some experience in charge of children, as substitute teacher and coach, respectively. However, Paul, George and Richard only had their K-12 apprenticeship of observation and experiences as college students to guide them. As such, participation in this class was certain to challenge their preconceptions, beliefs, and dispositions. However, it could be argued participation in any education class that overtly considered pedagogical enactment would be effective in challenging participants' stances.

The participants themselves noted how placement of the class affected their thinking. For example, John expressed how he would have liked the class to be offered later in the program. His concern was with classroom and resource management and he wanted to know more about pedagogies needed to teach social studies content, without having to consider technology. Similarly, George expressed how he would have appreciated learning classroom management before thinking about teaching and planning instruction. From this I can infer that both George and John were struggling to conceptualize a notion of teachers as pedagogue. Both participants expressed how difficult it was to create TPACK plans with their limited experience. Both participants' beliefs were challenged through participation in the class. It could be argued both George and John were made to feel uncomfortable as their beliefs were challenged, and this explains their desire for this class to be later in the program. Ultimately George and John's desire to move the class to later in the program is a manifestation of cognitive dissonance felt by having their assumptions challenged.

The limited viewpoints about the role of teachers held by George and John could not be shifted by participation in this class. It comes too early in their development, remember that it is

one of the first classes they take, and as such is unable to build on foundational knowledge beyond their apprenticeship of observation. Knowing that an educational technology class has the potential to impact teacher candidate understanding of TPACK in a small way when taken at the beginning of the program, I cannot help but consider how impactful this class might be if positioned toward the end, after acceptance into the program, with content methods passed as a prerequisite. I argue that if our participants were better versed in content and pedagogical knowledge gained in a methods class, then their overall levels of TPACK can only be enhanced further if they took the educational technology class after. Moreover, by this time their rationales for content specific instruction should be further developed and therefore the addition of a student-centered technology enhanced pedagogy can build upon their understanding of what it means to teach.

Participants' struggles to reconcile their dispositions with course expectations are also worthy of discussion. If participants had taken this class later in their program, would they have demonstrated a more student-centered, constructivist approach to social studies in their TPACK plans? Would their rationales have been further developed by this time and if so, would their TPACK plans effectively demonstrate purposeful enactment? To what extent would their beliefs and dispositions have been challenged by participation in other program courses (e.g., classroom management, assessment, methods), or would they be reinforced? If taken later in the program, could an iteration of an educational technology course in this format have the more value and greater impact? I argue that for my participants this class was taken so early in their learning experience that it was bound to have some impact on consideration of TPACK, but minimal impact on their enactment of TPACK. For those teacher educators charged with consideration of

where to place classes in a program, this study raises many questions that merit future discussion.

Relevance of class content. As shown in Chapter Five, certain modules in the class caused participants to deeply consider aspects of TPACK, challenged their beliefs, or helped them shape a burgeoning rationale. However, not all assignments or modules were popular or seen as relevant. Chief among these was the Excel assignment. In this assignment, participants had to create an Excel spreadsheet based on the results of an assessment. They were then tasked with analyzing the results and recommending future action for the class instructor. Participants were divided about the relevance and use of this assignment. For example, Paul and Richard liked the assignment, as they had never used the tool before. Richard expressed that, “It was tedious, but it was something I could see myself using when I’m a teacher” (Interview 2). However, John and Pete believed the task was unnecessary: “The focus was on creating the spreadsheet, not on the analysis. I want to know how to teach it” (Pete, Interview 2).

Opinions on this task were divided because participants saw two different purposes for the task. Paul and Richard saw the assignment as an example of exposing future teachers to a tool they might use in the future, and they saw it as useful, whereas John and Pete saw the task as focused on a tool. Unlike other assignments in the class, this module did not require students to create a TPACK plan and use the tool for instruction. So, participants were unsure about the purpose of the task and therefore did not see much value to it. This was also a concern voiced by Linda. As I explained in Chapter Four, she wanted the class to challenge students to think about how they might teach with technology and not focus on the tools; however, this task was solely based on how a teacher might use a tool. It was teacher-centered in design and did not truly align with the course intent. When asked about why it was included in the new iteration of the class,

the instructor stated that local instructional technology coordinators and administrators wanted teachers who could work with data. They will be exposed to different gradebooks and management systems, but fundamentally they need to know how to collect and use data. She was fully aware of how the assignment was better suited to the old model of instruction and that future iterations would likely focus less on constructing an Excel spreadsheet and more on constructing a TPACK plan that shows implementation of the recommendations made from the data.

The class instructor was surprised at how divided participants were about this assignment. In the context of this study though, it is evident that Paul and Richard's lack of classroom experience made them inclined to enjoy this assignment more than John and Pete. For Paul and Richard, the Excel task did not challenge their beliefs, and so they could enjoy learning the tool without thinking about teaching with it. In contrast, John and Pete felt strongly that unless an assignment was focused on their future instruction, it had little relevance to their development. In this instance, the participants' prior experiences shaped their reaction to the assignment. For those whose stance was rooted in their K-12 apprenticeship of observation, creating an Excel spreadsheet was viewed as purposeful and meaningful. It supported their teacher-centered, content delivery pedagogical stance. Participants whose school biography went beyond their K-12 student viewpoint were less inclined to see relevance in an assignment focused on tools for teaching, even though there was still a meaningful purpose to the task. Although participants created teacher-centered TPACK lesson plans (except for John's Web 2.0 assignment) and expressed how their instruction would remain teacher-centered and often lecture-based, there was an obvious difference in the pedagogical stance taken by the participants who had spent some time in front of children.

Instructor's analysis of class. Although this study was focused on how preservice social studies teachers learned TPACK through their participation in a standalone educational technology class, as illustrated above, other topics of discussion not entirely pertinent to the research question were revealed. As with issues of class placement in the program, and issues surrounding relevance of the class content provide further context in which to understand the findings as well as further avenues of investigation, the instructor's analysis of the class not only provides an alternative perspective on the how the participants learned TPACK, but also affords an opportunity to learn more about the purpose and pedagogy behind the class delivery. This gives the study an extra lens through which future investigation may be conducted.

As I noted in Chapter Four, it was the purpose of the instructor to teach a new iteration of the class in a new way. Whereas the old course was based on how to use technology, the new course embraced the evolution of technology. When interviewed after the class ended, the instructor explained how the old class was an example of "what not to do." For example, the old course had a WebQuest assignment which was, in her opinion, exactly how not to teach with technology. In her opinion, web quests are glorified scavenger hunts in which teachers determine the internet sources used, and the information they want students to learn from it. Web quests often do not facilitate meaningful inquiry, nor do they leverage the potential of Web 2.0 applications which encourage students to collaborate, communicate and create content. In the old course, when participants were asked to consider instruction, they were encouraged to think about teacher-centered instructional uses for technology and not learner-centered instruction. Most of the old iteration of the course was all about, "how to get the teachers to use technology, it had very little to do with incorporation" (Instructor's Final Interview).

Brush and Saye's (2009) contention that meaningful technology integration cannot be taught in a standalone educational technology class was uppermost in her mind when she redesigned the class:

I was adamant about taking the technologies out. The purpose of the class is to understand how to incorporate technology into the curriculum, not how to use LiveText™, so it helps them through the rest of the course. That's the objective. (Final Interview)

Her intention was to design a course that could shift from how to use tools, and instead would move students to think about technology within the context of their future teaching. As such, she also stated her rationale was to challenge the existing experiences of teacher candidates, "I wanted to them to transform learning, to get them thinking...beyond the box...so it's kind of nudging them in a way of well...a hard nudge, of thinking about technology integration, but not necessarily doing what you've always done" (Final Interview). Without overtly embracing the call that teacher educators should challenge teacher candidates' apprenticeship of observation, the instructor incorporated it as an overarching purpose for the course. This goes some way to explaining the impact of the class upon each participant.

Moreover, she addressed the need to address participants' apprenticeship of observation and assumed, quite rightly in this case, their experiences with technology were not pertinent to successful integration and implementation. She noted, "These students have come from an era where not only was it not advocated that you use it. They were told the opposite often. They shouldn't use it." Likewise, she also understood the dilemma they faced when their beliefs were challenged:

They've got this part where teachers who they really respect and telling them not to use it, plus they're at college, so they've done fairly well through the school, so they'll have –

they saw it's doing well – they saw the lessons they had, they said no, they work.

(Instructor's Final Interview)

Her position is consistent with research on challenging teacher beliefs as outlined in Chapter Two. However, unlike researchers who champion rationale development to challenge preservice teacher belief, the class instructor felt it was most important to overtly model practice and refer to how she is modelling it in class. She also emphasized to students her desire for them to put pedagogy and content before the technology tools. She explained, "I would like them to understand standards and some pedagogies, and I'm thinking how to connect the two, how it works" (Final Interview).

Therefore, Linda's intent was to challenge participants' apprenticeship of observation by overtly modelling and discussing her practice, and trying to make them consider pedagogy and content ahead of the technology tool. As I previously discussed, this was a challenge because the class participants had taken little or no formal education classes. Their conception of pedagogy was based in their apprenticeship of observation, and as the findings demonstrated, it was hard to move a teacher candidates' pedagogical stance when their stance was almost non-existent to begin with. This would explain why John and Pete ended the class with the most developed rationales and some thoughts toward student centered instruction, even though the in-class products did not necessarily reflect this.

Moreover, although there was no focus on rationale development among her students, she did notice that their products reflected a difference in approach toward the end of the class. She explained that with technology, the point of it is not always obvious or overt, "...sometimes you don't always see it, especially when you try to look for negatives" (Final interview). At the outset of the class, students showed a reluctance to consider technology as anything more than a

frivolity which distracts from real teaching and learning. This was reflected in the initial interviews of the participants who considered instructional technology as something that is fun, or engaging. Indeed, Paul's stance on the matter barely changed throughout the class, although he did begin to see a need to engage students for them to learn better. However, by the end of the class, the instructor described that her students accepted technology as an essential component of the learning process. Thus, she noticed a difference in her students because of participation in the class. Her anecdotal observation concurs with the other findings of this study.

Limitations

As with most case study research, the boundaries for this study were predetermined, which placed limitations on what could be learned (Yin, 2014). I limited the investigation to one semester's implementation of the Educational Technology course, and limited participants to social studies teacher candidates. Had I investigated an alternative iteration of the class with a similar population, I may have gained greater insight into how much shifts in preconceptions, belief, and dispositions were a result of participation in the class, or participation in any educational class at this point in their developments.

Similarly, although my focus was on the learning of social studies teacher candidates, had I included teacher candidates from other disciplines, I could have ascertained the extent that the class influenced teacher candidate development with more consistency. Teacher candidates from other disciplines could have served as participants whose experiences could be analyzed in comparison to the social studies participants. This would have meant that a cross-case analysis would be necessary, but may have answered questions such as:

- To what extent was class content responsible for shifting pedagogical thinking of teacher candidates?

- How far does the class challenge teacher candidates' experiences of learning with technology?
- Is rationale development the same for social studies teacher candidates as it is for others?
- Are there activities in the older iteration of the class which challenge teacher candidate dispositions?

A study that addresses these questions may be able to reveal a deeper or nuanced understanding of the complex nature of teacher candidate learning, helping to understand the multiple factors at play in more detail.

Likewise, this study was limited in scope to one semester of learning by the teacher candidates. Following their experiences as they navigated other classes in their program, and learning about their evolving pedagogy, understanding of TPACK and development of rationale, would provide more longitudinal data that could help me to better understand how these important aspects of preservice teacher learning are developed. Questions which remain unanswered are:

- To what extent is TPACK addressed in other classes?
- Do teacher candidates' understanding of TPACK develop in other classes?
- How do teacher candidates' dispositions evolve because of participation in different education classes?
- How are teacher candidates' rationales for teaching challenged in other classes?
- How do other classes challenge teacher candidates' K-12 apprenticeship of observation?

By examining these questions, I might develop a better understanding of programmatic vision and goals, with the TPACK framework, and development of rationale in teacher candidates at the

center of the learning. How far their evolving epistemologies were nurtured or challenged in other classes would help me to better understand the impact this class had on participant development.

Issues of validity are also a concern when using limited case studies such as this. Investigating the learning of social studies teacher candidates in such a confined context of one class raises issues of external validity. In my data analysis and findings, I have been mindful not to extend commentary beyond the scope of the case at hand. As I explained in Chapter Three, internal validity was addressed with multiple data sources and member checking (Merriam, 1998, Stake, 2005). However, I could not help but to consider whether external validity may have been improved by using participants from other disciplines and other iterations of the class to provide comparison points. Therefore, the inferences I make, arguments for future directions, and conclusion drawn, would be better supported if I had taken some of the actions outlined in this section.

Future Directions

After conducting this case study, I argue there was more to learn about how preservice social studies teachers develop their understanding of TPACK. The findings and discussion points arising from the study, all previously mentioned in this chapter, provide much to consider for teacher educators, teachers, program designers, and anyone interested in the learning of teacher candidates. By far the greatest implication for future action is the issue of where can teacher candidates best learn TPACK?

Where Best to Learn TPACK

In Chapter Two, I described how the consensus among social studies researchers is for social studies teacher candidates to learn about TPACK in social studies methods classes, or similar content specific spaces. In these spaces, it is argued, they can learn about social studies pedagogy from social studies teacher educators who promote meaningful technology integration into the course. However, not all teacher educators have the knowledge, ability, inclination or time to purposefully integrate technology into their classes. In already overcrowded curricula, there is no guarantee that TPACK would be meaningfully addressed in these spaces.

This study demonstrated how, contrary to the accepted consensus among social studies researchers, a standalone Educational Technology class can be an appropriate venue for teacher candidates to better understand TPACK. In classes like the one in this study, teacher candidates must consider the use of technology to support student learning of content. This is a different type of class to those critiqued by previous researchers, where the emphasis was on learning to use technology tools to support teacher efficacy. By shifting the emphasis of instruction from the tool, to the use of tools to support teaching and learning, the participants could consider their social studies pedagogy through a more student-centered lens. Therefore, a strong case can be made for infusing TPACK as a framework in other classes to promote teacher candidates' understanding of the interplay between technology, pedagogy and content knowledge.

The Role of Rationale and Vision

However, designing courses around the TPACK framework alone is no panacea. In Chapter Two I also described the consensus among researchers who call for a rationale based approach to teacher education. Through the promotion of a vision for quality teaching, or the development of purposeful rationales, it is argued that teacher education programs would have more impact in addressing the already entrenched preconceptions and beliefs of teacher

candidates. Teacher education classes, therefore, would need to consider ongoing development of teacher candidate rationale for such an approach to be successful.

Yet the class in this study was not designed to consider preservice teacher rationale or vision. There was an overt aim to address participants' misconceptions in their understanding of what it meant to teach with technology. The main strategy adopted by the instructor was to model student centered practices such as the use of flipped instruction. Thus, the students were exposed to new ideas, but not given time to reflect on them in any way. Nevertheless, the participants in this study did describe burgeoning rationales which were adapted or built upon as the course progressed. Therefore, I recommend that every teacher education class with a focus on instruction should address issues of rationale building, or development of a curricular vision in teacher candidates. Had this class more overtly addressed rationale, or even promoted more opportunities for students to reflect upon their new learning in relation to their school biographies, it is highly likely that the participants would have already begun to craft more meaningful purposes for teaching social studies that go beyond a love of history content.

As shown in this study, classes such as this do go some way to challenging teacher candidates' preconceptions, beliefs, and dispositions; however, they do not overtly address them. From this study, I support the conclusion that any impact class participation had on rationale development, or any challenge to participants' pedagogical stances, was minimal at best. Indeed, in their final interviews, the consensus among the participants was social studies was more engaging if taught in a student-centered manner. However, they were not convinced the use of technology was essential in meeting students' needs, and generally viewed the tools as helpful to them as teachers who sought more entertaining methods of content delivery. More progressive minded participants such as Pete and John erred toward a lecture, test, and paper model of

instruction, albeit made more efficient using technology tools for testing, organizing, and delivering content. Although they both talked about a desire for student centered social studies instruction using technology to develop student skills, Pete and John still reverted to their original purposes for instruction. Therefore, if this class, and similar classes are to have any future impact upon the epistemological foundation of preservice social studies teachers, it must overtly address rationale development.

Class Placement and Course Structure

Thus far, the principle implication I make concerns issues of where best to learn TPACK, and the importance of rationale development in that process. However, another factor for future consideration is the placement of this class in the overall program of study. In this instance, the class was the first or second education class taken by participants. As a result, they found the coursework challenging. At no time in their careers thus far had they been asked to devise learning plans so by considering instruction centered around TPACK, participants were engaging in pedagogical thinking for the first time in their development. Although Linda considered TPACK plans a gateway to instructional design for the teacher candidates in the class, in their interviews, the participants expressed how they felt unprepared to think in this manner. George, for example, wanted to learn more about classroom management before he could really think about content delivery, while Paul felt that he did not know enough about teaching generally to craft meaningful instructional plans. It is a lot to expect a lasting impact from an introductory class like this one, particularly as it was delivered so early in the program.

Of the participants, only Pete and John really seemed to grasp a deeper understanding of TPACK from their participation in the class. They both could verbalize a rationale for teaching social studies by the end of the class, and they both could advocate for meaningful technology

integration in social studies, even though they reverted to a more traditional model of content delivery in their planning. Both Pete and John had spent some time in front of students, as a coach and substitute teacher respectively. I can infer that teacher candidates with experience of teaching roles in schools and classrooms benefited the most from participation in the class. The implication here is that moving the class to later in the program might create a more meaningful experience for students. Likewise, it could help with content methods instruction by promoting content specific technology enhanced instruction at a time that is more developmentally appropriate for teacher candidates. Likewise, teacher candidates in standalone technology classes should be encouraged to spend time in real classrooms observing how teachers use technology tools, and juxtaposing their learning of TPACK within these experiences. Program administrators need to carefully consider class placement, the need for focused classroom observation hours, and opportunities to meaningfully reflect on rationale development for standalone educational technology classes to be truly impactful.

Future Frameworks: TPACK + R

As a framework, TPACK serves a useful purpose. As demonstrated by this study, it necessitated the reorganization of the class to recognize the role of technology to enhance student learning. teacher candidates had to consider the interplay between technology, content, and pedagogy for the first time in their careers. As a result, they were challenged to reconsider what it meant to teach social studies with technology. To be successful the participants had to reimagine what they knew to be good social studies teaching as informed by their apprenticeship of observation, and try to shift, not always convincingly, or successfully, to a more skills based, student centered approach to instruction. Learning in a class developed and instructed around the TPACK framework was instrumental in this. However, as already discussed, this was not enough

to truly shift the participants' pedagogical stance. Nor was it enough to develop a rationale for teaching social studies which might serve as a keystone to their pedagogical approach.

It is my proposal that future classes adopt a modified TPACK framework to acknowledge the role of rationale development in teacher candidates. As alluded to toward the end of Chapter Two, social studies researchers indicated that methods instruction should merge rationale development with TPACK to ensure the promotion of effective reflective practices and rationale development. From this study I conclude that the need for such a framework is not restricted to methods classes alone. There is much value to embedding TPACK within a rationale-based approach in any education class.

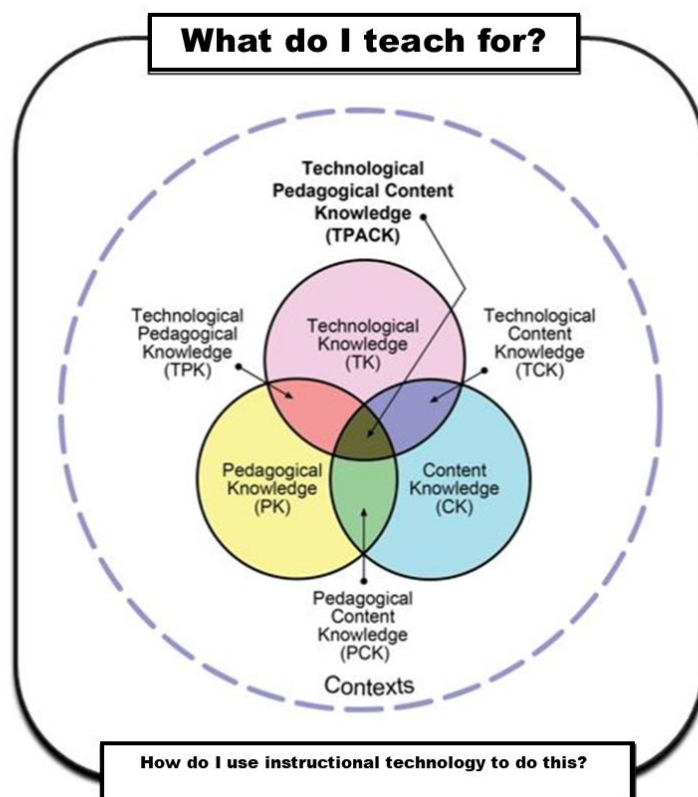


Figure 6.1 TPACK +R

For example, the class used in this case study could be further improved if opportunities for reflection and rationale development were incorporated into the coursework. TPACK would remain at the center, and the key objective of the class would be to develop an understanding of TPACK by teacher candidates. Rationale development would be encouraged by asking Dinkelman's (2009) question, "What do you teach for?" and in the case of social studies teacher candidates, "What do you teach social studies for?" Obviously, the latter question could be reconfigured to suit any content specialty, for example, "What do you teach English / P.E./ Science / Marketing /Elementary Literacy/ for?" The question itself becomes ubiquitous. Therefore, I recommend future iterations of this class adopt TPACK+R as a framework for instruction. Moreover, if whole programs were to fully implement Darling-Hammond et. al.'s (2005) vision for rationale-based practice at the heart of preservice teacher development, adopting TPACK+R as a framework around which all classes are built, might go some way to improving teacher candidates' understanding of what it means to teach and learn in the modern era, as well as combatting preconceptions, beliefs, and predispositions toward reflexively conservative, teacher-centered instruction learned through their own school experiences. At the core of James' (2008, 2010) scholarship was a commitment to challenging preservice teacher belief, even though it was perceived as an impossible task.

In this study, I demonstrated that beliefs can be challenged by a combination of framing instruction around TPACK in the class, and consideration of rationale in the participatory process. I posit that a sustained, programmatic approach to both teaching and learning via TPACK, and rationale development combined in TPACK +R, will make the problem of preservice belief less impossible to overcome.

Recommendations for Further Research

Learning TPACK

Along with other research, this case study only scratches the surface of how teacher candidates learn to understand and implement TPACK. To better understand the learning of TPACK, more research is needed into how teacher candidates learn aspects of the model in a variety of contexts. Indeed, the data for this study may go some way to helping our understanding of the learning of TPACK. As it stands, this study examined the class as a case, and investigates how the activities, structure, and programmatic placement, challenges teacher candidate preconceptions, beliefs, and dispositions as evidenced in their understanding of TPACK. However, if this data was to undergo cross-case analysis, where the learning of TPACK of each participant was questioned, then it would be possible to develop a sense of how the class directly influenced their learning of aspects of TPACK. This type of study would have implications for researchers and teacher educators interested in the learning of educational technology. Similar recommendations for improvement of this dissertation also apply to a proposed cross-case analysis.

Similarly, further investigation is needed in areas of educational technology and teacher education. Attention needs to be paid to the enactment of different contents and subject areas through learning within a TPACK framework. Further cross-case analysis, like the one just mentioned, could be conducted to help outline an understanding of how the complex interplay of technological, pedagogical, and content knowledge are unpacked in the various type of educational classes offered to teacher candidates.

Rationale Development

Similarly, the role played by the development of rationale in the learning of teacher candidates is still under researched. The consensus for an overt, systemic approach to rationale development by teacher candidates to combat issues of preconceptions, belief, and disposition still needs further evidence to more adequately support the notion. As with the learning of TPACK, using a cross-case analysis would generate nuanced understanding about the types of students who would be influenced by the class to enhance their rationales. Furthermore, because of this dissertation, I strongly recommend investigation into how rationale development influences the enactment phase of teacher candidate learning.

TPACK + R

Likewise, it would be beneficial to put the TPACK+R model to the test. Would classes that overtly address rationale development around a TPACK framework have any more success in developing their teacher candidates' learning of TPACK? The effect of rationale development within this context would greatly help in ascertaining how much the participants in this study were influenced to consider their rationales by participating in the study and reflecting upon their practice in their interviews. More case studies of classes that apply this model of instruction would be welcome. Moreover, more cross-case analysis comparing student to student and class to class would also reveal deeper insight into whether this is a viable framework.

Longitudinal Research

Much benefit would be gained if the participants of this study could be tracked and interviewed in their later classes, and followed into their initial placements once they qualify. It would be interesting to observe and report on the methods of instruction they adopt once in

classrooms of their own, and insightful to see if any later classwork completed influenced their understanding of TPACK as well as their developing rationales. The extent to which their beliefs continued to be challenged or re-enforced would be worth understanding as it would provide further insight into the complex nature of preservice teacher education and enactment.

TPACK and SAM-R

As teachers enter classrooms of their own, so their understanding of TPACK is not as important as how they implement technology in their instruction. At this stage, the SAM-R model, Substitution, Augmentation, Modification, and Redefinition (Puentedura, 2008) is the model that should be applied to teacher enactment of practice. As illustrated in the figure below, the SAM-R model evaluates how pedagogy is transformed through purposeful uses of technology. Beginning with substitution and augmentation, for example, replacing a worksheet with a digital copy, to modification of the task with technology, such as conducting group discussions with invited experts using Web 2.0 tools, to redefinition, which is a modification of the pedagogy previous considered inconceivable. SAM-R can only occur when technological, pedagogical, and content knowledge are combined. Therefore, how social studies teachers use technology to go beyond using tools to substitute teacher actions and instead use technology to modify and redesign instruction needs to be examined once they are in classrooms of their own. Questions about the extent that social studies teachers teach powerful pedagogy, meaningfully supported by technology also need to be understood. Likewise, the potential to correlate a teachers' understanding of TPACK and their enactment of SAM-R in the social studies, as well as other content areas would add value to our understanding of how teachers learn to integrate technology into their practice.

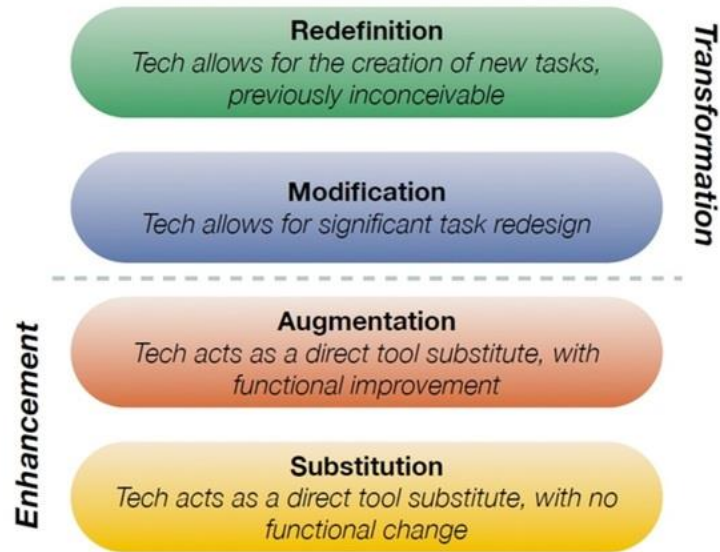


Figure 6.2 SAM-R (Puentedura, 2008).

Challenging Preconceptions, Belief, and Dispositions

As with the other areas of this study, more research is needed on ways to challenge preservice teacher preconceptions, belief, and dispositions. The extent to which rationale development can be a factor in challenging preservice experiences gained through the apprenticeship of observation needs to be better understood. Likewise, other strategies implemented by teacher educators to address issues of preservice teacher belief need to be examined and evaluated. At the time of writing, the research within social studies strongly suggests rationale development can be a successful method to combat reflexive conservatism. However, it may not be the only effective method. The work done by schools and school systems in challenging the dispositions of in-service teachers needs to be evaluated further in this context. Similarly, the role of rationale and vision development in other content areas is also worthy of investigation to achieve a deeper understanding of how teacher candidates learn.

Conclusions

A case study such as this is mainly concerned with how problems of teacher education can be solved by examining soft subjects like vision, rationale development, preservice teacher beliefs, preconceptions and dispositions. As I have shown throughout, these are factors that hold increasing weight in teacher education research. As such, they are important areas to consider when examining the learning of teacher candidates. However, an understanding of how best to investigate the interplay of these factors is burgeoning at best. There is a lot a researcher can offer the academe if they pursue an inquiry along these lines.

In a time of standardization, it would seem counter-intuitive for school systems to focus on pedagogy that goes beyond teaching to a multiple-choice test. Yet increasingly this is the case. Indeed, a local school system served by the university in this study recently released a transformational learning framework calling for a focus on the dispositions of leadership, teachers, students, the learning environment, and the community. This is an important development as it is an example of a school system acknowledging the importance of dispositions in the process of teaching and learning. The implication is that when searching for future teachers, they will closely examine the dispositions and beliefs of teacher candidates who graduated from the College of Education at Southeastern University. Moreover, school systems who recognize the importance of disposition look to challenge the current thinking of their staff to fit the demands of modern curricula for modern learners. It is important, therefore, for teacher educators to embrace the teaching of soft skills in their teacher preparation, regardless of which framework they use. The development of rationale to challenge preservice teacher beliefs is now given more weight and importance because of this shift in school system thinking.



Figure 6.3 Transformational Learning (Cashwell, Banicky, & Gorham, 2017).

In the shifting paradigm of expectations which force school systems to re-articulate values and place an emphasis on dispositions as a core consideration of all stakeholders, this dissertation and similar studies such as this are important. They help teacher educators to better understand how they might tackle the complex issues of preservice teacher belief and disposition. By using this case study as an example, it is possible to infer that a successful teacher education program must be framed around a framework designed with modern pedagogy in mind. TPACK proves to be a suitable model to build a course around as each class can focus on the interplay of the various parts of the framework. I posit that TPACK+R could be an even more successful model for building technology-oriented education classes as it overtly addresses issues of rationale building and teacher purpose. However, this is yet to be tested.

If, as teacher educators we look to break down, challenge, and redefine the beliefs, preconceptions, and dispositions of all teachers, preservice and in-service, then it will be possible to transform classroom practice in schools. Models such as SAM-R can support the developing practice of teachers as they look to modify and redefine how they use technology in their pedagogy. R+SAM-R, placing rationale around the SAM-R model, could continue the work of TPACK+R in challenging in-service teachers to consider how their vision and rationale can become enacted in their classrooms. These models may potentially be influential in social studies and beyond.

Finally, it is my hope that this study goes some way to furthering the consideration of the intricate problem of technology in social studies teacher education, and technology in teacher education in general. Classes that adopt a robust framework which considers the implications of pedagogical decision making, can begin to challenge preservice teacher preconceptions. It is my recommendation that classes should also overtly adopt an approach for rationale building to strengthen pedagogical decision-making of teacher candidates. Modern day classrooms need teachers who successfully transition from an apprentice of their own experience, to a leader of instructional practice. Research such as this helps teacher educators to better understand the complex issues of teacher education, preservice teacher learning, and enactment in content specific contexts.

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APPENDIX 1

Informed Consent Form



Project Title: Developing Technological Pedagogical Content Knowledge in a Complex Learning Space: A Case Study of an Elementary Social Studies Methods Course

Introduction: The intention with this form is to provide detailed information that may affect your decision to participate in this research study. This form also serves as a record of consent for individuals who agree to serve as participants. The purpose of this research is to explore how participation in an elementary social studies methods course influences preservice teachers' preconceptions, beliefs, and dispositions toward technological, pedagogical, content knowledge (TPACK).

Description of Research Study: In this project, a social studies teacher educator will research preservice elementary social studies teachers' preconceptions, beliefs, and dispositions towards TPACK in the context of their elementary social studies methods class. In particular, the researcher is interested in the factors that pre-service teachers consider when making pedagogical decisions. Moreover, the researcher is also interested in any changes of belief and disposition toward TPACK that the preservice teacher experiences as a result of their methods class participation.

Your participation in this project is voluntary. If you consent to participation, I will collect the following data which is a part of the existing methods course experience: drafts of your rationale document (the final exam) and the final version of the rationale document; weekly reading summaries; online writing prompts, and lesson plans developed for the class. Weekly reading summaries and lesson plans will be collected because they are representative of ideas expressed in the rationale document. Additional data includes 3 surveys that will provide a self-reported measurement of your understanding of technological, pedagogical, content knowledge. As well as three semi-structured interviews conducted at the beginning, after the mid-point, and after the conclusion of the course.

Exclusionary Criteria: Participation is based upon one requirement: Enrollment in the social studies methods class.

Risks and Benefits: There are no foreseeable risks to you as a participant. There are no direct benefits for participation, however, the results may contribute to professional growth and provide a better understanding of the preservice teacher experience and your development as a social studies teacher. The researcher will provide you with a copy of the research results at the conclusion of the study upon request.

Confidentiality: Any information you provide for this research study will be treated confidentially and kept in a password protected program on a computer in a private office. Data with identifying information will be destroyed upon completion of study. The results of this study may be used in reports, presentations, or publications; however, no individually identifiable information (i.e., name, school, third-parties) will be presented.

Withdrawal Privilege: Your participation in this research is strictly voluntary. You are free to withdraw at any time. Your decision would not affect the relationship with the researcher or result in any negative consequences related to your enrollment in the course. A decision to not participate will not affect your course grade or standing.

Voluntary Consent: By signing this form, you are saying that you have read and understand the research study procedures presented to you in this form.

I, (print full name) _____, have read and understand the foregoing information explaining the purpose of this research and my rights and responsibilities as a participant. My signature below designates my consent to participate in this research, according to the terms and conditions listed above.

Signature _____ Date _____

Investigator's Statement: I, Mark Diacopoulos, certify that I have explained the nature and purpose of this research, including benefits, risks, costs, and procedures. I have described the rights and protections afforded to human subjects and have not pressured, coerced, or pressured the participant into participating. We are aware of the obligations under state and federal laws, and promise compliance.

Signature _____ Date _____

Should you have any questions, please direct them to the project researcher, Mark Diacopoulos (mdiac001@odu.edu), or the Darden College of Education IRB committee chair, Dr. Ed Gomez (egomez@odu.edu).

APPENDIX 2

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 individual name or identification number will not at any time be associated with your responses. Your responses will be kept completely confidential and will not influence your course grade.

DEMOGRAPHIC INFORMATION

1. Your ODU e-mail address

2. Gender

- a. Female
- b. Male

3. Age range

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

4. Year of Study

- a. Junior
- b. Senior
- c. Masters

5. Area of Specialization

- a. Art
- b. Special Education
- c. English and Language Arts
- d. Foreign Language
- e. Health /P.E
- f. Mathematics
- g. Music
- h. Science
- i. Social Studies
- j. Speech/Theater
- k. Other

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)					
Social Studies					
7. I have sufficient knowledge about social studies.					
8. I can use a historical way of thinking.					
9. I have various ways and strategies of developing my understanding of social studies.					

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.					289
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 mathematics.					
18. I can select effective teaching approaches to guide student thinking and learning in literacy.					
19. I can select effective teaching approaches to guide student thinking and learning in science.					
20. I can select effective teaching approaches to guide student thinking and learning in social studies.					
TCK (Technological Content Knowledge)					
21. I know about technologies that I can use for understanding and doing mathematics.					
22. I know about technologies that I can use for understanding and doing literacy.					
23. I know about technologies that I can use for understanding and doing science.					
24. I know about technologies that I can use for understanding and doing social studies.					

TPK (Technological Pedagogical Knowledge)					
25. I can choose technologies that enhance the teaching approaches for a lesson.					
26. I can choose technologies that enhance students' learning for a lesson.					
27. My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.					
28. I am thinking critically about how to use technology in my classroom.					
29. I can adapt the use of the technologies that I am learning about to different teaching activities.					
30. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.					
31. I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom.					
32. I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district.					
33. I can choose technologies that enhance the content for a lesson.					
TPACK (Technology Pedagogy and Content Knowledge)					
34. I can teach lessons that appropriately combine mathematics, technologies and teaching approaches.					
35. I can teach lessons that appropriately combine literacy, technologies and teaching approaches.					
36. I can teach lessons that appropriately combine science, technologies and teaching approaches.					
37. I can teach lessons that appropriately combine social studies, technologies and teaching approaches.					

Models of TPACK (Faculty, PreK-6 teachers)				
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	<i>25% or less</i>	<i>26% - 50%</i>	<i>51% - 75%</i>	<i>76% - 100%</i>
Models of TPCK				
38. 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?				
39. 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?				

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

73. Describe a specific episode where an ODU 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.

74. Describe a specific episode where one of your K-12 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.

75. 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

Sample TPACK Surveys

TPACK Surveys - Participant 3

Survey Number	One	Two
Pseudonym	George	George
Please specify your gender.	Male	Male
What is your current age?	18-22	18-22
What is your current year of study?	Junior	Junior
What is your area of specialization?	History	History
I know how to solve my own technical problems	Neither Agree or Disagree	Agree
I can learn technology easily	Disagree	Agree
I keep up with important new technologies	Disagree	Agree
I frequently play around with technology	Disagree	Neither Agree or Disagree
I know a lot of different technologies	Disagree	Agree
I have the technical skills I need to use technologies	Neither Agree or Disagree	Agree
I have sufficient knowledge about social studies	Strongly Agree	Strongly Agree
I can use a historical way of thinking	Strongly Agree	Strongly Agree
I have various ways and strategies of developing my understanding of social studies	Agree	Strongly Agree
I know how to assess student performance in a classroom	Disagree	Agree
I can adapt my teaching based-upon what students currently understand or do not understand	Neither Agree or Disagree	Neither Agree or Disagree
I can adapt my teaching style to different learners	Neither Agree nor Disagree	Agree
I can assess student learning in multiple ways	Neither Agree or Disagree	Agree
I can use a wide range of teaching approaches in a classroom setting	Neither Agree or Disagree	Neither Agree or Disagree
I am familiar with common student understandings and misconceptions	Neither Agree or Disagree	Neither Agree or Disagree
I know how to organize and maintain classroom management	Neither Agree or Disagree	Neither Agree or Disagree

I can select effective teaching approaches to guide student thinking and learning in social studies	Agree	Agree
I know about technologies that I can use for understanding and doing social studies	Agree	Agree
I can choose technologies that enhance the teaching approaches for a lesson.	Agree	Agree
I can choose technologies that enhance students' learning for a lesson	Agree	Agree
My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom	Agree	Agree
I am thinking critically about how to use technology in my classroom	Neither Agree or Disagree	Agree
I can adapt the use of the technologies that I am learning about to different teaching activities	Neither Agree or Disagree	Agree
I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn	Neither Agree or Disagree	Agree
I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom	Neither Agree or Disagree	Agree
I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom	Neither Agree or Disagree	Agree
I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district	Neither Agree or Disagree	Neither Agree or Disagree
I can choose technologies that enhance the content for a lesson.	Agree	Agree
I can teach lessons that appropriately combine social studies, technologies and teaching approaches	Agree	Agree

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?	76%-100%	76%-100%
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?	25% or less	25% or less

TPACK Surveys - Participant 4

Survey Number	One	Two
Pseudonym	Richard	Richard
Please specify your gender.	Male	Male
What is your current age?	18-22	18-22
What is your current year of study?	Senior	Senior
What is your area of specialization?	History	History
I know how to solve my own technical problems	Neither Agree or Disagree	Neither Agree or Disagree
I can learn technology easily	Agree	Agree
I keep up with important new technologies	Agree	Agree
I frequently play around with technology	Neither Agree or Disagree	Neither Agree or Disagree
I know a lot of different technologies	Agree	Agree
I have the technical skills I need to use technologies	Strongly Agree	Strongly Agree
I have sufficient knowledge about social studies	Strongly Agree	Strongly Agree
I can use a historical way of thinking	Strongly Agree	Strongly Agree
I have various ways and strategies of developing my understanding of social studies	Strongly Agree	Strongly Agree
I know how to assess student performance in a classroom	Strongly Agree	Strongly Agree
I can adapt my teaching based-upon what students currently understand or do not understand	Strongly Agree	Strongly Agree
I can adapt my teaching style to different learners	Agree	Agree
I can assess student learning in multiple ways	Agree	Agree

I can use a wide range of teaching approaches in a classroom setting	Strongly Agree	Strongly Agree
I am familiar with common student understandings and misconceptions	Agree	Agree
I know how to organize and maintain classroom management	Agree	Agree
I can select effective teaching approaches to guide student thinking and learning in social studies	Agree	Agree
I know about technologies that I can use for understanding and doing social studies	Agree	Agree
I can choose technologies that enhance the teaching approaches for a lesson.	Agree	Agree
I can choose technologies that enhance students' learning for a lesson	Agree	Agree
My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom	Agree	Agree
I am thinking critically about how to use technology in my classroom	Strongly Agree	Strongly Agree
I can adapt the use of the technologies that I am learning about to different teaching activities	Agree	Agree
I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn	Agree	Agree
I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom	Agree	Agree
I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom	Agree	Agree
I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district	Agree	Agree
I can choose technologies that enhance the content for a lesson.	Agree	Agree

I can teach lessons that appropriately combine social studies, technologies and teaching approaches	Agree	Agree
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?	76%-100%	76%-100%
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?	51% - 75%	51% - 75%

APPENDIX 4

Interview Protocol 1

Semi-structured interview protocols

Initial Interview

1) Opening Question:

Thank you for your participation in the study. I am interested to know about your experiences as a learner of social studies. Can you please describe some examples of what you considered to be good or memorable social studies experiences that you had?

Please describe your general experiences with social studies instruction.

Follow up: In Elementary School
 In Middle / Junior High School
 In High school
 At college / university level.

2) Experience of technology infused social studies.

Can you describe any example of how your teachers used technology in their social studies instruction?

Follow up:

Please describe your specific experiences with technology infused social studies instruction.

Follow up: In Elementary School
 In Middle / Junior High School
 In High school
 At college / university level.

3) Referring to the survey that you took. Can you elaborate on your self-assessment? Why did you rate yourself _____ in the area of:

- a. Technology knowledge?
- b. Content knowledge?

- c. Pedagogical content knowledge?
- d. Technological content knowledge?
- e. Other aspects of the survey (as selected by interviewer/researcher).

Follow up:

To what extent do you see yourself using technology in your social studies instruction?

- Can you describe specific examples of how you might use technology in your social studies instruction?

How do you think your participation in the Educational Technology course might influence your pedagogical decisions?

- When thinking about your instruction, how important is technology integration in your thought / planning/ decision-making process?

APPENDIX 5

Interview Protocol 2

Semi-Structured Interview 2.

This interview will use the data collected thus far as a stimulus for discussion.

It will be conducted in four parts:

1) Focus on experiences with educational technology class thus far:

- a. What have you liked about the class?
- b. What have you disliked?
- c. What have you learned about educational technology from participation in the class?
- d. How likely do you see yourself implementing some of the things that you have learned about in the course so far?
 1. What are you most likely to use?
 2. What are you least likely to use?
 - a. Explain your answers, give examples where necessary.

2) Focus on teaching of social studies:

- i. What aspects of social studies teaching do you consider the most important?
- ii. What are the most important skills that you need to consider when teaching social studies?
- iii. Can you describe specific examples of how your learning in this course might relate to your learning to be a social studies teacher?

3) Looking at your TPACK survey, do you think you might change any of your self-assessments? From participation in this course, what might have changed (if at all) about your self-assessment in the areas of:

- i. Technology knowledge?
- ii. Content knowledge?

- iii. Pedagogical content knowledge?
- iv. Technological content knowledge?
- v. Other aspects of the survey (as selected by interviewer/researcher).

4) Examining the class assignments completed so far,

- i. explain which has been your favorite?
 - 1. Why is it your favorite?
 - a. Researcher should inquire about pedagogical choices, future implementation, and try to gain insight into the pedagogical decisions made by the participants.
- ii. Which is your least favorite?
 - 1. Why?
 - a. What pedagogical choices were made.
- iii. Which of the products you have created are you most likely to use in your future social studies instruction?
 - 1. Why did you choose this?
 - 2. How might it be done different/ improved?
- iv. Which of your products are you least likely to use in future instruction?
 - 1. Why?

APPENDIX 6

Interview Protocol 3

Semi-Structured Interview 3.

This interview will use the data collected thus far as a stimulus for discussion.

It will be conducted in four parts:

1) Focus on experiences with educational technology class thus far:

General question:

What aspects of the class influenced your future practice as an educator?

Give examples of class activities and how they influenced thinking about teaching.

2) Focus on teaching of social studies:

What parts of the class have influenced your thinking about how you might teach social studies?

Give examples of the class activities and how they might relate to social studies teaching.

3) Were there any differences in TPACK survey responses now that you have completed the class?

4) Examining the class assignments completed so far,

From your portfolio:

Pick an example of your best work that reflects how you might teach social studies with technology.

Is it an accurate reflection of your current thinking about social studies pedagogy?

Has your view changed about how social studies should be taught?

If so – what has prompted that change in viewpoint?

Now you have completed this, and another course – what do you teach social studies for?

How are you going to achieve it?

APPENDIX 7

TPACK Template

Content	Subject	
	Grade Level	
	Learning Objective <i>The objective of the lesson is what students will be able to do as they finish the activity. For this objective, use the Standards of Learning (SOL) to say what you want to focus on. You can find the SOLs at http://www.doe.virginia.gov/testing/ look on the right of the screen for the subjects and go from there.</i>	<i>Copy and paste the standard/s here from the website</i>
Pedagogy	Activity <i>Describe what the learning activity will be. What will the students and the teacher be doing? (This includes what they are doing with the technology).</i>	
Technology	Technology <i>The link to the IWB lesson.</i>	

Before you submit, delete the explanatory text (the text in small italics).

VITA

Mark Michael Diacopoulos

EDUCATION:

M.S.Ed., Secondary Education,
Old Dominion University, May 2007
Concentration: Literacy

BA (Hons), History & American Studies (2nd Class upper)
Keele University, Keele, Staffordshire, England, May 1994
Certification of Education: History & Social Studies

RESEARCH:

BOOK CHAPTERS

Diacopoulos, M.M. (2017). Mobile Learning and Social Studies Higher Education: A thematic review of recent research. In H. Crompton, & J. Traxler, (Ed.). *Mobile Learning and Higher Education: Challenges in Context* (pp. 166-176). New York: Routledge.

Branyon, A., Diacopoulos, M. M., Gregory, K., & Butler, B. M. (2016). The power of autobiography: Unpacking the past, understanding the present, and impacting the future while establishing a community of practice. In D. Garbett & A. Ovens (Eds.) *Enacting self-study as methodology for professional inquiry* (pp. 119-127). Herstmonceaux, UK: Self-Study of Teacher Education Practices (S-STEP).

ARTICLES

Gregory, K., Diacopoulos, M. M., Branyon, A., & Butler, B. M. (2017). From skepticism to scholarship: Learning and living self-study research in a doctoral seminar. *Studying Teacher Education*, 13(3), 257-274. DOI: 10.1080/17425964.2017.1365702

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Overbaugh, R.C., Lu, R., & Diacopoulos, M.M. (2015). Changes in teachers' attitudes toward instructional technology attributed to completing the ISTE NETS*T certificate of proficiency capstone program. *Computers in the Schools* 32 (3-4), 240-259. DOI: 10.1080/07380569.2015.1059254

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BOOK REVIEWS

Diacopoulos, M. M., & Butler, B. M. (2015). Exemplary elementary social studies in the age of accountability [Review of the book *Exemplary elementary social studies: Case studies in Practice*, by A. S. Libresco, J. Alleman, S. L. Field, & J. Passe]. *Theory and Research in Social Education*, 43 (4), 560-567. DOI: 10.1080/00933104.2015.1064735