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District Mandated Changes in Technology and Inquiry-Based Instruction

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DISTRICT MANDATED CHANGES IN TECHNOLOGY AND INQUIRY-BASED INSTRUCTION

by

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Federal and state mandates aimed at improving the American K-12 school system abound (Spillane, 2004). Federal legislation of the No Child Left Behind Act of 2001 (NCLB, 2002), and state-mandated curriculum are aimed at improving teaching and learning thus ultimately improving student achievement. The purpose of this phenomenology study was to examine the experiences of 7 middle and high school social studies teachers through district-mandated changes in inquiry-based instruction and technology-integrated lessons. By capturing how individual teachers experience mandated changes, this research aimed to discover the existence of policy coherence within a district as it translated federal and state policy into changes in teacher beliefs, knowledge, and practice, and whether mandating change really works to change teacher beliefs, knowledge, and classroom practice.

Multiple methods of data collection were used in this research. The interview protocol was designed to elicit descriptions of how teachers interpreted their experiences with mandated pedagogical changes through the lens of (a) beliefs regarding instructional technology and its use in the classroom, (b) using inquiry as a teaching approach, (c) professional development, (d) administrative support, (e) collaboration with colleagues, (f) resources for inquiry-based instruction and technology, (g) facilitating or

impeding factors to effective implementation, and (h) change in instructional practices. The interviews were transcribed, analyzed, and grouped in the aforementioned eight themes. Also, a classroom observation protocol was developed based on the participating district's Principles of Learning (POLs) and Disciplinary Literary (DL) expectations. Furthermore, Professional Learning Community (PLC) and professional development events artifacts were analyzed.

This study reveals policy incoherence within the district. Even though participating teachers had differing operational definitions of technology integration and their application of inquiry-based instruction varied, they worked diligently to implement the policy expectations. This study also documents significant barriers to effective policy implementation when working in an at-risk urban environment; most significantly noted were unbalanced resource allocation, lack of administrative press and accountability when it involves teachers who are resistant to change.

The study concludes with recommendations for improvements in these important reform strategies.

DEDICATION

To my wife, Jessica

Who encouraged me to pursue this dream;

her love, patience, and sacrifice made it possible

To Jana and Kalani

Whose daddy missed so many family dinners, bedtimes, and Saturdays

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Thanks to my Curriculum Department colleagues who used their expertise to bring clarity to data collection instruments, and thanks to the teachers who participated in this study. I hope this study will be useful to the participating district and other school districts in their effort to improve teaching and learning.

Finally, a special word of thanks to the family, specifically to my parents, Kizombo and Wababili Feza-Kalumbula; Dan and Mary-Ann Conklin, and Scott and Dee Dee Rolff, who made the spiritual commitment and financial sacrifices to give their children the solid foundation of a Christ-centered education. You have been true rainbows in my life. Thanks, Moms. Thanks, Dads.

Mulonge Musa Kalumbula

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CHAPTER I

INTRODUCTION

Background and Purpose

Federal and state mandates aimed at improving the American K-12 school system abound: federal legislation of the No Child Left Behind Act of 2001 (NCLB), and in the state of Michigan, the state-required curriculum known as the Michigan Merit Curriculum (MMC).

> The Michigan Merit Curriculum defines a common set of required credits for graduation and provides educators with a common understanding of what students should know and be able to do for credit. It also provides students the learning opportunity, knowledge and skills they need to succeed in college or the workplace. (Michigan Department of Education [MDE], 2004)

This curriculum sets forth Grade Level Content Expectations (GLCE); High School Content Expectations (HSCE) for the core academic subjects of English Language Arts, Mathematics, Science, and History/Social Studies; and Michigan Educational Technology Standards (METS). These expectations or standards are aimed at improving teaching and learning with the ultimate goal of improving student achievement.

In 2006, the State of Michigan mandated that schools integrate inquiry-based instruction and technology into teaching and learning. There are numerous studies that

investigate federal and state mandates or policy regarding school reform (Elmore, 1987, 1990; Fuhrman, Clune, & Elmore, 1991; Hess, 2003; McDonnell, 2005; O'Day, 2002; Resnick & Zurawsky, 2005; Spillane, 2004). Much has also been written about change in schools (Abelmann, Elmore, Even Kenyon, & Marshall, 1999; Wagner et al., 2006), inquiry-based instruction (Lambert, 2002; Matusevich, 1995), and technology-integrated instruction (Eteokleous, 2008; Lei, 2009; MacMillan, Timmons, & Liu, 1997; Simpson et al., 1994, cited in Glynn, Taasoobshirazi, & Brickman, 2007). Unfortunately, there has been little research about how district-level policymakers' interpretation of state policy results in mandated change at the classroom level in inquiry-based instruction and technology integration.

Furthermore, many districts have responded to federal and state policy by mandating change within their systems through a variety of policy instruments such as curriculum, common assessments, and professional development. However, not many district leaders (i.e., central office personnel and lead teachers) take the time to understand the experiences of individual teachers as they grapple with implementing these expectations at the classroom level. The current study may help provide some insight into the questions, "How do individual teachers experience mandated changes?" and "Does mandating change at the classroom level in inquiry and technology really work in changing teacher beliefs, knowledge, and practice?"

Statement of the Problem

Numerous studies (e.g., Junker et al., 2005; Oppenheimer, 2003, cited in Spillane, 2004; Semich & Runyon, 2002) have illustrated the interplay between federal and state

mandates in directing policies that drive school reform, especially triggers such as low student achievement on standardized tests, decreased graduation rates, and industry complaints about ill-prepared work force, which lead to the creation of such policies and reform efforts. The most notable trigger, the Back-to-the-Basics movement of the 1970s, which gave rise to others like it, prompted many school districts to pay greater attention to instructional issues (Elmore & McLaughlin, 1988; Fuhrman et al., 1991; Glickman, 1995; Shulman, 1987). A number of districts have responded to federal and state policy by mandating change within their systems through a variety of policy instruments (Spillane, 2004). They have attempted to influence classroom instruction through various combinations of policy instruments such as curriculum guides, student assessments, instructional supervision, curriculum materials, and professional development (Spillane, 2004, p. 47).

The majority of these reforms aimed at improving teaching and learning, with the ultimate goal of improving student achievement through changing teacher practice. Research has been clear about the relationship between improved teaching practices and student learning (Brand & Moore, 2011; Cambourne, 2002; Cochran-Smith, 2000; Dinkelman, 2003; Ryan & Hornbeck, 2004). However, what happens when these mandates are disseminated through the aforementioned policy instruments is less clear. Consequently, not many district leaders take the time to understand the experiences of individual teachers as they grapple with the mandated expectations and how these expectations are being implemented at the classroom level. Literature that chronicles how teachers undergo change or respond to changes, whether the change is brought about

through mandates or by other means, suggests several impeding or facilitating factors on how that how that change occurs: (a) teachers' belief systems regarding teaching in general (Richardson, 1996; Van Driel, Bulte, & Verloop, 2007); (b) teachers' beliefs about students' ability to learn (Blackwell, Trzesniewski, & Dweck, 2007; Cohen & Ball, 1990; Dweck, 1991, 2008; Resnick & Hall, 1998); (c) teachers' perceptions and overall feelings about organizational leaders and their ability to usher in substantive change (Elmore, Abelmann, et al., 1996, cited in Elmore, 2000; Grove, Strudler & Odell, 2004; Pelgrum, 2001; Rogers, 2000); (d) teachers' views of technology and its role in the classroom (Ertmer, Addison, Lane, Ross, & Woods, 1999); (e) lack of technology resources (Russell & Bradley, 1997); (f) training in and comfort with the use of technology (Guha, 2001; Yang & Huang, 2008); and (g) time (Zhao & Frank, 2003).

Research that bears directly on the proposed study includes studies conducted by Ertmer (2005) and Bodur, Brinberg, and Coupey (2000, cited in Hew & Brush, 2007), who argued that teachers' beliefs and their willingness to change those beliefs have a great effect on how they experience mandated changes. Furthermore, Fullan (1985) and Smith (2000) stated that even if teachers' beliefs may have changed, incorporating a new practice takes time. In the same vein, studies by Magnusson, Krajcik, and Borko (1999) and Calderhead (1996) claimed that an adjustment in one's beliefs and the act of trying new practices brings about only limited change. For a more substantive transformation, the continuation of building new knowledge is essential. Furthermore, it is suspected that lack of subject matter knowledge is an impeding factor for teachers who want to try something new. More often than not, due to fear of the unknown and/or fear of failure,

teachers stick to what they know, seeking comfort in the familiar. As Mann (1978, cited in Guskey & Sparks, 1996) argued, while teachers are strongly committed to student learning and want to improve learning outcomes, they often oppose radical alterations to their instructional procedures.

Contrary to a number of studies about teacher beliefs, practice, and knowledge that portray classroom practice as impenetrable by policies, Spillane (2004) found that, for most teachers, specifically the participants in his study who taught math and science, the district instructional policies became the standards. The study concluded that state standards, as mediated by district policy, do indeed reach classrooms. He pointed out that a major facilitating or impeding factor to individuals adhering to the policy is often the manner in which it is implemented. To underscore the assertions of Spillane, for example, in discussing why more teachers do not use the constructivist approach of knowledge building, often referred as disciplinary literacy, or other inquiry-based practices to teach history/social studies in the classrooms, Dr. Sam Wineburg, director of the Read Like an Historian Project at Stanford University and author of *Historical Thinking and Other Unnatural Acts*, said, "With lackluster planning and spotty implementation, any well intentioned change process is doomed to fail" (S. Wineburg, personal communication, May 27, 2011). Wineburg's comment is underscored by Spillane (2004). Spillane found when school district policymakers initiated policies that supported only surface-level understanding of the standards, they limited the opportunities within the formal school system for teachers to make sense of those standards. In contrast, when district policymakers initiated policies that nurtured deeper-level understandings of the standards,

they created opportunities to make sense of the standards at a more substantive level. Spillane added that classroom teachers do heed instructional policies, especially local school district policies. Moreover, teachers attempted in good faith to incorporate the ideas they understood from these policies into their practice, even though some teachers were much more successful in that than others (Spillane, 2004). Interestingly, in Spillane's study, when the materials that were being used to instruct closely resembled the expectation/standards, teachers had an easier time of trying new things in changing their practice.

As previously discussed, state, federal, and district-mandated policy may have an impact on teacher beliefs, knowledge, and practice. It is important to understand how teachers experience these mandates. Specifically, it is important to know how teachers reflect on the process through which they make sense of the mandated changes regarding how they teach using inquiry methods and technology. It is equally important to understand how teachers build new beliefs, new knowledge, and new practices in their profession, as well as how they relate to and fit into their professional learning community and their role within the classroom environment.

Research Purpose

The purpose of this study, which uses a phenomenological approach, is to understand the experiences related to new knowledge, new beliefs, and new practices required of 7 secondary school teachers in one Midwestern urban district (Carver Public Schools) in response to district-mandated changes in pedagogical requirements, both in technology and inquiry-based instruction.

Research Questions

Using the lens of constructivism, innovation diffusion theories, and technology integration models, this study seeks to answer:

1. In terms of knowledge, beliefs, and practices, how do teachers experience district-mandated changes in both technology and inquiry-based instruction in their daily practice?
2. Is there policy coherence within a district as it translates federal and state policy into changes in teacher beliefs, knowledge, and practice?
3. Does mandating change at the classroom level in inquiry and technology really work in changing teacher beliefs, knowledge, and practice?

Research Significance

There are several reasons why this study may be important to federal, state, district policymakers and school administrators (i.e., principals, chief technology officers), and classroom teachers. One reason is the limited literature and research pertaining to the lived experiences of middle and high school social studies teachers in a school district as they work to meet the expectations of ever-present mandated changes aimed at school reform.

A potential benefit of conducting this study is that understanding more about how teachers experience mandated changes in inquiry-based instruction and technology may assist school policymakers to better engage teachers in either (a) helping to validate, commit to, and implement the changes in instructional practice associated with inquiry- and technology-integrated lessons; or (b) taking initiative to investigate, propose, and

implement new evidence-based policy as school reform strategies relate to inquiry- and technology-integrated lessons. Learning more about how teachers experience mandated changes in inquiry-based instruction and technology may provide insights for future school policymakers as they consider mandating inquiry-based instruction and technology as a reform strategy. Furthermore, a potential direct benefit to the participating teacher may be that, by receiving a copy of the scripted lesson via researcher's notes and engaging in conversation with the researcher, he or she may reflect on teaching practice.

Theoretical Foundation

Hughes and Busch (1991) stated, "Theories are most useful for influencing practice when they suggest new ways in which events and situations can be perceived" (cited in Spillane & Diamond, 2007, p. 103). In that vein, the theoretical foundation of this research is social constructivist theory. Constructivism has been developed through the contribution of notable individuals such as Thomas Kuhn, John Dewey, and Immanuel Kant. Constructivism as a theory helps explain how people learn (Lambert, 1995, 2002; Matusevich, 1995; Resnick, 1983; Sherman & Kurshan, 2005; Vygotsky, 1962/1986). Inquiry-based instruction is often associated with constructivism. Central to the tenets of inquiry-based instruction and constructivism is the premise that students are the primary focus of instruction. All texts, tasks, and conversations associated with instruction are intentionally selected and orchestrated to facilitate sense-making and knowledge-building for the learner.

As corroborated in Spillane (2004), using mathematics as an example, if students are to appreciate what it means to do mathematics, they will need opportunities to make and revise conjectures, to reason with one another about their mathematical ideas, and to justify their solutions and methods to others (Lakatos, 1986; Lampert, 1990; National Council of Teachers of Mathematics [NCTM], 1989, cited in Spillane, 2004). In Spillane's example, the students are doing the work. The teacher's role is to facilitate the conversation and aid students in making sense of what they are learning.

Additionally, this study is anchored in Diffusion Theory. Everett Rogers' (1995) Diffusion Theory attempts to explain how innovations permeate social networks. Diffusion Theory is applicable to this study's phenomenon of inquiry-based instruction and technology integration in instruction and fits the scope of this study in that Rogers defined an innovation as "an idea, practice or object that is perceived as new by an individual or other unit of adoption" (p. 11). It helps explain the stages of innovation adoption, rate of adoption, and effects of the innovation on adoption process and the varying degrees of adoption (Fuller, 2000; Van Braak, 2001). It does not matter if the idea, practice, or objective is new; rather, it is the perception of novelty. Furthermore, Rogers argues, innovation does not necessarily mean "better," or that the new idea is more beneficial to an individual. Whereas innovation can refer to something abstract, like an idea, it can also be concrete, like a new piece of technology (Straub, 2009, p. 626). The phenomenon of mandated changes in inquiry and technology experienced by the participants identified for this study represents innovation. Throughout this study, there

will be mention of Christensen's (1997) Disruptive Innovation Theory as referenced by Yu and Hang (2010).

Contextually, in order to participate in this study, the subjects had to be veteran high school social studies teachers in an urban district and must have taught for at least 5 years. Due to factors such as a history of low achievement and budgetary constraints, high school teachers in Carver Public Schools (CPS) were abruptly assigned to teach in a blended environment as a means of cutting costs and boosting student achievement. In a short period, they were asked to deliver instruction in both a face-to-face and online environment. The abruptness of the expected change in how their teaching and learning occurred constitutes disruptive innovation. The expectations for teachers who had been teaching grades 6-8 were not quite as disruptive. Although these teachers were not directed to flip their classroom immediately, they had to adhere to common syllabi and assessments that incorporated numerous web tools and teacher resources, as well as a textbook that could be accessed both digitally and in print. To briefly explain, in a traditional classroom, the introduction to the content is given in class through a lecture or small exploratory activity, and the deeper engagement occurs outside of class through homework. In what is now referred to as "flipping the classroom" (Baker, 2000) or "inverted classroom" (Lage & Platt, 2000; Lage, Platt, & Treglia, 2000), the students are assigned to watch the lesson introduction video outside of class, while the deeper content exploration happens in the face-to-face environment (Bergmann & Sams, 2012; Strayer, 2007).

In their in-depth review of literature dealing with disruptive innovation, Yu and Hang (2010) argued that mainstream studies divide technological innovations into two types but use different terminologies to define different stages in history. They argued there are two general classes of technologies: (a) revolutionary, discontinuous, breakthrough, radical, emergent, or step function technologies; and (b) evolutionary, continuous, incremental, or "nuts and bolts" technologies (Florida & Kenney, 1990; Morone, 1993; Utterback, 1994). Regardless of the category in which the technological innovation falls, organizational culture and climate play a major role in how disruptive that innovation is. Yu and Hang reported that a school district's organizational culture is a critical component of its success. Culture is an effective way of controlling and coordinating people without elaborate and rigid formal control systems (Tushman, O'Reilly, Fenollosa, Kleinbaum, & McGrath, 2007). Specifically, for this research, which studies the lived experiences of secondary teachers regarding mandated changes in inquiry and technology, issues of culture may arise and be explored within the scope of this study. When momentous changes such as disruptive innovation occur, case studies have shown that the organizational culture generates cultural inertia, which is often difficult to overcome directly. Oftentimes cultural inertia is a key reason why managers (policymakers) often fail to introduce timely and substantial change, even when they know that it is needed (Christensen & Raynor, 2003; Henderson, 2006; Tushman et al., 2007). Within the context of this study, the question of organizational culture is explored in-depth through the lens of leadership, administrative support, and professional development.

Finally, Technology Pedagogy Content Knowledge and Technology Pedagogy Activity Content Knowledge (TPCK/TPACK) models of technology integration (Harris & Hofer, 2009; Koehler & Mishra, 2005) will be referenced in this study. The ideas of Koehler and Mishra (2005) fit this study in that the findings from their research were used to develop the policy instruments of technology-infused curriculum, lesson organization, and selection of activity types that help teach the standards outlined in the Michigan Educational Technology Standards (METS) and provide classroom teachers professional development in how to intentionally incorporate technology tools in daily instruction.

Methods Overview

Qualitative Approach

This study uses the phenomenological approach (i.e., the descriptive study of how individuals experience a phenomenon) to examine the phenomenon of district-mandated changes in inquiry and technology. The phenomenology method explores the in-depth the meaning, structure, and essence of the lived experience of a certain phenomenon by an individual or by many individuals. This method allows the researcher to search for commonalities across individuals, rather than focusing only on what is unique to a single individual.

In keeping with Robert Stake's (1995) classification of phenomenology, this study is focused on understanding only the particulars of the case, specifically the experiences of teachers in one urban district with district-mandated instructional changes in inquiry and technology. Multiple methods of data collection were used in this

phenomenology research (e.g., interviews, observation, documents). This phenomenological study's final report provides a rich (i.e., vivid and detailed) and holistic (i.e., describing the whole and its parts) description of the phenomenon and its context.

Even though it not the focus of this study, some participating teachers' interpretations of relationships with others with whom they interacted in experiencing this phenomenon surfaced based on their frames of reference in the classroom with technology and technology-literate students (Bogdan & Biklen, 1998; McGrail, 2005). These interpretations have been noted as information that helps create context for the unfolding narratives. The research findings, therefore, are not generalizable to all policymakers and district-mandated changes in technology and inquiry. The focus of qualitative research is to understand the participants' perceptions and the manner in which those experiences make sense in their lives (Creswell, 2009; Maxwell, 1992). To ensure the trustworthiness of the themes revealed in the findings, member checking and feedback loops with the participants were used, thereby improving the accuracy of the interpretation of their experiences.

Conceptual Framework

To understand the effect of district-mandated change in inquiry-based instruction and technology integration on the lived experiences of secondary school teachers in an urban school district, it is important understand the assumptions and literature on how mandated change has been conceptualized in the past. The conceptualization below is presented in several sections, as presented in Figure 1. At the top of the figure, section 1

describes the theoretical foundations of constructivism, innovation diffusion theories, models of disruptive innovations and Technology Pedagogy Content Knowledge (TPCK/TPACK). This study is anchored in the grand theory of constructivism. In conducting this research, I looked broadly at social constructivism (Vygotsky, 1978) as a micro theory, as well as Diffusion Theory (Rogers, 1995). Section 2 describes the areas that the mandated changes intended to impact (i.e., inquiry and technology). It specifically describes the mandated changes in how teaching and learning were to occur in Carver Public Schools using technology and inquiry-based instruction. Disruptive innovation theory (Christensen & Raynor, 2003) and the TPCK model (Harris & Hofer, 2009; Koehler & Mishra, 2005) for technology integration are referenced because these ideas jointly add context to the process of bringing about new knowledge, cultivating new beliefs, and facilitating new practices. Section 3 of the conceptual framework describes the individual dispositions of teachers in terms of current attitudes, belief systems, knowledge, practice, and past experience. The described attributes (i.e., current belief systems, past experiences, attitudes, current knowledge and practices of an individual) are important to explore in that they mediate how he or she experiences mandated changes. The fourth section of the conceptualization articulates the district's policy instruments (i.e., curriculum guides, student assessments, instructional supervision, curriculum materials and professional development, and technology in terms of software and hardware) aimed at fostering the desired changes in teachers. The fifth section shows the expected outcomes of the mandated changes in terms of new beliefs, new instructional practices, and new knowledge. The literature reviewed concerning teacher beliefs,

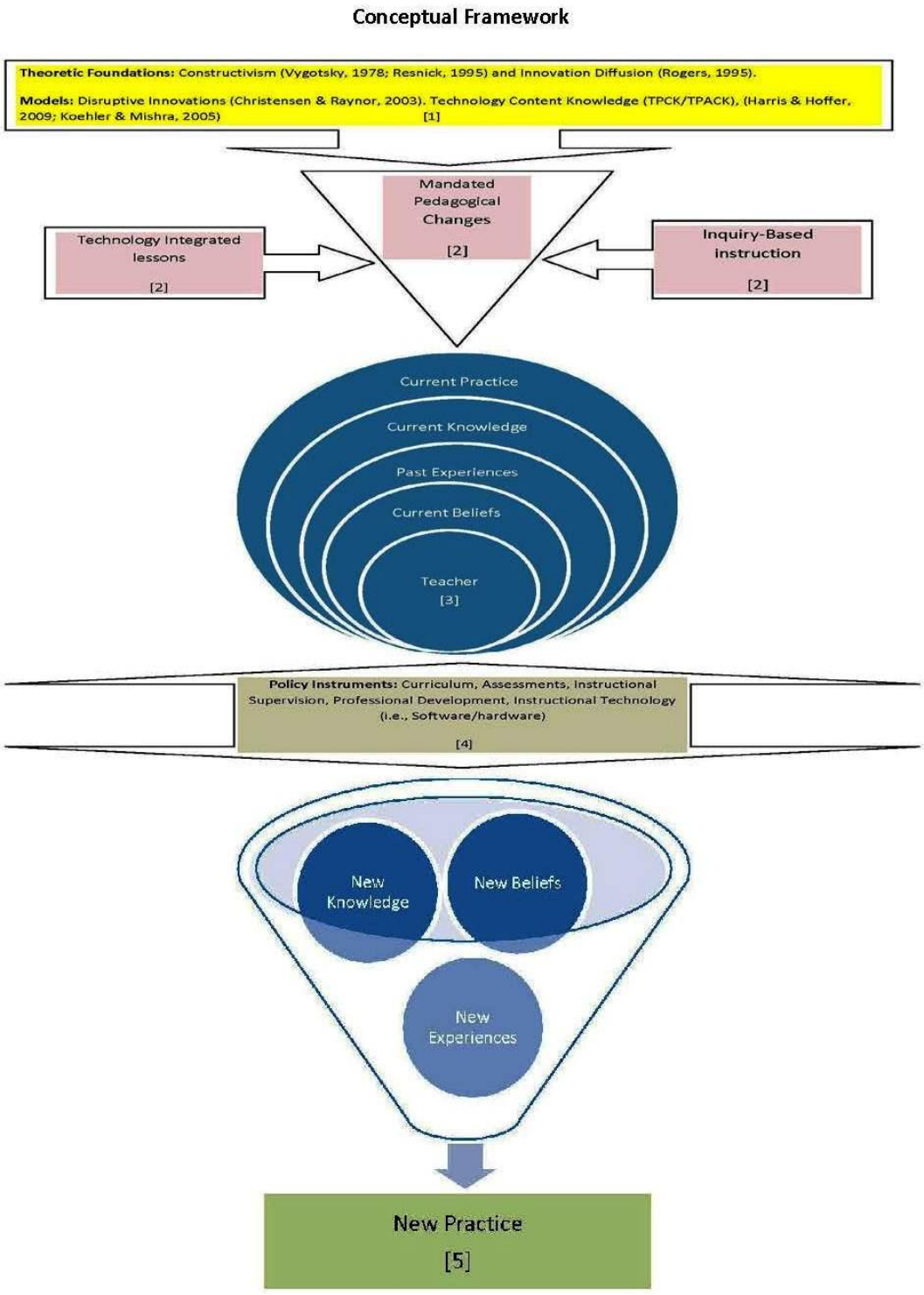

Figure 1. Conceptual model of study.

knowledge, and practices includes discussions of current understandings regarding effectiveness, or lack thereof, in the area of district-mandated changes, teacher beliefs, attitudes toward inquiry instruction and technology in the classroom, implications, and recommendations for district policymakers. See Figure 1 for further explanation of the study's conceptual framework.

Definitions of Terms

The definitions of the following terms provide explicitness and direction for the study.

Android: Android is the operating system of smart phones, like the Windows is the operating system on a computer (http://answers.yahoo.com/question).

Beliefs: Beliefs can be defined as premises or suppositions about something that is felt to be true (Calderhead, 1996; Richardson, 1996).

Constructivism: Constructivism is an epistemology, or a theory, used to explain how people know what they know. The basic idea is that problem solving is at the heart of learning, thinking, and development (http://www.kohlerlearningcenter.com).

Disruptive innovation: Disruptive innovation is a powerful means of broadening and developing new markets and providing new functionality, which, in turn, may disrupt existing market linkages. It also includes not only technological products, but also services and business models innovation, such as discount department stores, low price, point-to-point airlines, and online businesses education (Adner, 2006; Charitou & Markides, 2003a, 2003b; Christensen, 1997; Christensen & Bower, 1996; Christensen & Raynor, 2003; Danneels, 2004; Govindarajan & Kopalle, 2006; Yu & Hang, 2010).

Edmodo: Edmodo is a social networking site made for communication between teachers and students. It operates a lot like Facebook, with wall posts and status updates. It can be incorporated into classrooms through a variety of applications including Reading, Assignments, and Paper-studying.

The EDUCATION 2020 program: E2020 program enables a student to recover one or many credits in a manner flexible to the needs of the school as well as the student. The administrator may assign credit recovery work ranging from a section missed or failed by a student up to and including the entire course.

The Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects: The "standards are the culmination of an extended, broad-based effort to fulfill the charge issued by the states to create the next generation of K-12 standards in order to help ensure that all students are college and career ready in literacy no later than the end of high school" (www.corestandards.org).

Close and critical reading: Reading carefully to thoroughly comprehend and evaluate what is read. To the critical reader, any single text provides but one portrayal of the facts, one individual's "take" on the subject matter. Critical readers thus recognize not only what a text says, but also how that text portrays the subject matter. They recognize the various ways in which each and every text is the unique creation of a unique author.

- *What does the text say?*
- What a text says – restatement
- *How does it say it?*

- What a text does – description
- *What does it mean?*
- What a text means – interpretation
- *So what does it mean to me?* – application

(Michigan Department of Education, 2010)

Creative Commons: Creative Commons helps you share your knowledge and creativity with the world. Creative Commons develops, supports, and stewards legal and technical infrastructure that maximizes digital creativity, sharing, and innovation (http://creativecommons.org/).

Database: A collection of data on which we can perform operations such as:

1. Storing data (save)
2. Manipulating data (update, delete, insert, sort)
3. Retrieving data (whenever necessary, we can see the data in a particular table form, or use selected data, as in a computer program)

Disciplinary Literacy (DL): Disciplinary Literacy asks students to think, talk, write, and read like historians or social scientists.

Disciplinary Literacy Coach (DL Coach): A DL coach or IC in the Carver Public Schools (CPS) played various roles, some of which are to assist teachers in applying the disciplinary literacy strategies learned during Professional Learning Community team meetings into their classroom instruction, to facilitate Learning Walks, to hold instructional conversations, to conduct collegial observations, and to facilitate Professional Learning Community team meetings (CPS, 2011).

Ebook: Ebook is abbreviation for "electronic book." Unlike a normal printed book, an ebook is in document format such as pdf. It can be read on a computer and some special ebook readers.

Evernote: Evernote is an intuitive program that allows its users to capture information from many interfaces (https://evernote.com).

Flipped or inverted classroom: A classroom structure that moves the lecture outside the classroom via technology and moves homework and practice with concepts inside the classroom via learning activities.

Gaggle: Gaggle is an Internet website for schools (www.gaggle.net).

Google docs: It is simply a document reader/writer like Microsoft Word, but from here you can access your documents from any computer using your Google account (www.wiki.answers.com).

Governance Board: Governance Boards in Carver Public Schools were designed as a mechanism through which teachers reported how they were increasing student achievement. Governance Boards were composed of a building administrator (e.g., principal or assistant principal) and district level administrators (e.g., deputy superintendents, executive directors, and various supervisors).

Glogster: Glogster is a social network that allows users to create free interactive posters, or Glogs. A Glog, short for graphics blog, is an interactive multimedia image. It looks like a poster, but readers can interact with the content (http://en.wikipedia.org/wiki/Glogster; www.glogster.com).

Hardware: Hardware consists of the physical components of a computer.

Info-Host: Carver Public Schools' hosted self-paced professional development portal.

Innovation diffusion: Innovation diffusion explains how innovations permeate social networks.

Inquiry-based instruction: Learning that allows participants to interact around common topics has been found to lead to deeper levels of understanding (Vygotsky, 1978).

Inspiration Software: Inspiration Software is computer software is visual learning and thinking software used by educators, students and business professionals (www.inspiration.com; http://www.chacha.com/question/what-is-the-inspiration-software-used-for#sthash.08zoHciO.dpuf).

Intermediate School District (ISD) and REMC8: ISDs are public agencies, supported by tax dollars, providing administrative and instructional services to local school districts, particularly in the areas of special and vocational education.

Institute for Learning (IFL): Institute for Learning bridges the domains of research and practice by conveying to educators the best of current knowledge about learning processes, principles of instruction, and the design of school systems (http://ifl.lrdc.pitt.edu/ifl/).

iPads: The Apple iPad is a tablet computer that has a 9.7-inch screen, Wifi, 3G (optional), 10-hr battery life, 1GHz processor, and comes in 16GB, 32GB, or 64GB (http://www.chacha.com/question/what-is-the-apple-ipad#sthash.WmDrxiO2.dpuf).

Letter of Agreement (LOA): A letter of agreement can be used to define the terms of agreement between two parties. This type of letter is typically used during negotiations in an attempt to outline the expected outcomes between two parties (www.rocketlawyer.com/document/letter-of-agreement.rl).

Mandated change: Mandated change is change that is "commanded" or "ordered" to occur by a person(s) in position of authority.

MAP testing: Measures of Academic Progress (MAP) tests are measures of academic progress. They are administered to students in over 1,200 school districts across the United States by the Northwest Evaluation Association. Measures of Academic Progress contains a series of assessments that students take to demonstrate academic growth in the areas of math, reading, using language, and science (http://www.ehow.com/about_5063650_map-testing.html#ixzz2gCE7opb3).

Michigan's High School Course Content Expectation (HSCEs): The High School Content Expectations (HSCE) establishes what every student is expected to know by the end of high school. Social Studies High School Content Expectations are not a social studies curriculum nor are they intended to limit what is taught. They are meant to be used as a guide for both curriculum development and assessment of learning, and the Michigan Merit exam (MDE, 2004).

Marginalia: Marginalia is the general term for notes, scribbles, doodles, and editorial comments made in the margin of a book (http://www.levenger.com/masterly-marginalia-694.aspx).

Michigan Educational Technology Standards (METS): "The Michigan Educational Technology Standards for Students (METS-S) are aligned with the International Society for Technology in Education's (ISTE) National Educational Technology Standards for Students (NETS-S) and the Framework for 21st Century Learning. The Michigan standards are intended to provide educators with a specific set of learning expectations that can be used to drive educational technology literacy assessments" (MDE, 2009).

MEAP tests: The Michigan Educational Assessment Program (MEAP) tests are criterion-referenced assessments based on Michigan's Grade Level Content Expectations (GLCEs). They are administered each fall to assess the content expectations of previous grades.

Nook: The Barnes & Noble Nook (styled "nook" or "NOOK") is a brand of e-reader developed by American book retailer Barnes & Noble, based on the Android platform (http://www.barnesandnoble.com/u/NOOK).

No Child Left Behind Act (NCLB): NCLB is the Education Reform Act signed into law by President George W. Bush as a continuation of the Goal 2000 Educate America. Its main purpose is to increase accountability on the part of schools as they address the needs of all students (http://www2.ed.gov/nclb/landing.jhtml).

NovaNet: NovaNet is a computer assisted instructional program, sort of an electronic textbook (http://schools.mukilteo.wednet.edu).

Practices (instructional best practices): Good and effective teaching methods that enhance student learning (Gagen & Bowie, 2005; Geisler, 1994; National Academy of Education, 1999; NASPE, 2009; Stein, Smith, & Silver, 1999).

PowerSchool: PowerSchool is the fastest-growing, most widely used web-based student information system (www.pearsonschoolsystems.com/products/powerschool/).

Phenomenology: Phenomenology is the descriptive study of how people experienced a phenomenon (Bogdan & Biklen, 1998).

School Improvement Grant (SIG): SIG schools are schools that have been in the lower 5% of the state's performing schools. Because of the schools' achievement history, SIG schools were given addition support, which included an infusion of technology and additional adults.

Sheltered Instruction Observation Protocol (SIOP): Sheltered instruction is an approach to teaching English language learners, which integrates language and content instruction.

Socrative: Socrative is a smart student response system that empowers teachers to engage their classrooms through a series of educational exercises and games via smartphones, laptops, and tablets.

Symbaloo: Symbaloo is the easiest start on the Internet. It can be used to discover pages with the best links about a subject, create pages with favorites, and share with other users (www.symbaloo.com).

Smarter Balanced Assessment: Smarter Balanced is a state-led consortium developing assessments aligned to the Common Core State Standards in English

language arts/literacy and mathematics that are designed to help prepare all students to graduate from high school college- and career-ready (http://www.smarterbalanced.org/).

Technology Pedagogy Content Knowledge (TPCK): This framework builds on Lee Shulman's (1987) construct of pedagogical content knowledge (PCK) to include technology knowledge. TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies, pedagogical techniques that use technologies in constructive ways to teach content, knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face, knowledge of students' prior knowledge and theories of epistemology, and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones.

Thinking Maps: Thinking Maps are visual tools that students and teachers can use to organize ideas and thus enhance learning (www.ehow.com).

Teacher Curriculum Institute (TCI): TCI is a K-12 publishing company that provides social studies textbooks and interactive social studies curriculum.

Weebly: Weebly is a free website hosting site which has free website building tools (http://www.weebly.com/#how-it-works).

Wired Wednesdays: Wired Wednesday was a day of the week designated by a team of teachers in one Carver Public Schools middle school to collaboratively learn about technology (CPS, 2012).

Summary

There has been significant research conducted on the interplay between federal, state, and district educational policy and how this connection manifests itself in the form of mandated changes, as well as numerous studies on how district policy is created in response to the legislated standards and is implemented in requisites of mandated changes through various policy instruments such as curriculum, assessments, and professional development. There is not enough known about the inherent impact these mandated changes in instruction and technology have on teachers as they work to implement the expected outcomes. Teachers' reflections on their lived experiences pertaining to district-mandated changes in technology and inquiry-based instruction have not been explored.

The discussion at the beginning of this chapter was centered on federal legislation of the No Child Left Behind Act of 2001 (NCLB, 2002), which states that all American students are entitled to high quality education delivered by highly qualified teachers. The NCLB reauthorized the Elementary and Secondary Education Act (ESEA) of 1965 and placed emphasis on the importance of teacher quality in improving student achievement. The Act further articulates the standards in the areas of content to be taught. Specifically, as pertains to this study, the broad intended outcomes for national standards for social studies and technology were mentioned. Also discussed were the State of Michigan's interpretations of those mandated standards through a merit curriculum (i.e., Grade Level and High School Content Expectations) and educational technology (i.e., Michigan Educational Technology Standards). Additionally, studies by Spillane (2004), Kelly (1999), and Firestone and Shipps (2003) showed that when confronted by federal

mandates, state and district policymakers do comply. In order to move beyond compliance, studies by Guskey (1986, 2002), Smylie (1988), Louis (1994), and Coburn and Stein (2006) talk about how change processes impact beliefs, practice, and knowledge of teachers and that most schools and teachers want what is best for students.

Much of the research, both empirical and theoretical, has especially focused on how policy is created, how policy is interpreted, and how schools change as well as specific impeding and facilitating factors to that change. In addition to the plethora of studies, journals containing prescriptive articles are widely available to those who seek information on educational research. Much of this literature includes meta analyses and longitudinal studies aimed at understanding policy, change process, barriers to the realization of desired change, interpretations of what constitutes constructivism, inquiry-based instruction, and technology-integrated instruction.

A varied and comprehensive look at how policy is interpreted by district policymakers and how those interpretations lead to district-mandated changes through forms of innovations that are aimed at changing teacher beliefs, knowledge, and practice is necessary.

This study is uniquely guided and structured by the lack of theoretical research relevant to teacher experiences with district-mandated changes in inquiry-based instruction and technology. This study explores how teachers respond to and make sense of mandated changes in teaching and learning. The researcher's intent is to uncover teachers' reflections on their lived experiences as they made sense of district-mandated changes in how they teach using technology and inquiry-based instructional methods, as

well as how those experiences have impacted their beliefs, knowledge, and practice. The background for this study includes the pertinent research and literature discussed in Chapter II. In particular, Chapter II examines the history of educational policy at the federal, state, and district levels and how individuals in experience the mandates that arise from its interpretations.

This study's design, including the research method and questions, is explained in Chapter III. The findings and data gathered for this study are described in Chapter IV, and the implications of this study are summarized in Chapter V, along with recommendations for future studies and additional research.

CHAPTER II

LITERATURE REVIEW

Background

Marshall and Rossman (2006) suggested three main functions of a review of pertinent literature while conducting qualitative research: (a) it demonstrates the underlying assumptions behind the general research questions, (b) it demonstrates that the researcher is knowledgeable about related research and the scholarly traditions that surround and support the study, and (c) it shows that the researcher has identified some gaps in previous research for which the proposed study will fill a demonstrated need.

As stated in Chapter I, the rationale for this study hinges on the unfortunate reality that very little has been written about how district-level policymakers' interpretation of state policy plays out within their organizations. Specifically, there is even less written about policymakers' understanding of how teachers experience district-mandated changes in their daily practice. It was also previously stated in Chapter I that the focus of this study is not so much about how district policy is crafted, but rather about understanding how teachers experience (in terms of knowledge, beliefs, and practices) district-mandated changes in both technology and inquiry-based instruction in their daily practice.

This chapter is outlined as follows. First, a brief discussion is presented regarding educational policy in broad terms. Second, the roots of current federal and state policy are explored. Third, federal policy on K-12 education is addressed. Fourth, the states'

response to federal policies on technology and inquiry is discussed. This study helps address some of gaps that have been mentioned by others who have studied educational policy. For example, Hew and Brush (2007) called for further research to examine in greater detail the specific barriers of technology integration. This study also aims to uncover barriers to integration as experienced by practitioners, classroom teachers.

Fifth, the impact of inquiry-based instruction and technology on student achievement is addressed by conducting a brief cost-benefit analysis of the financial investments at the federal, state, and district levels. It hoped that the findings of this study add to the conversation regarding the effectiveness or ineffectiveness of inquiry-based instruction.

Sixth, the district response to federal and state policy is explored, as well as how trying to meet the expectations outlined in those policies leads to mandated changes in how teachers teach using inquiry and technology. Also, this study addresses the scholarly shortcomings mentioned by Spillane (2004), Louis, Febey, and Schroeder (2005), and Hargreaves (1998), who lamented that few studies have investigated sense making in terms of the affective dimension of the implementation process, nor have they examined the relationship between district policymakers' and teachers' values and emotions and their sense making. This study addresses the aforementioned gaps in literature by looking at the teachers' lived experiences and extrapolating meaning from their narratives.

Also, as mentioned in Spillane (2006), scholars often focus too narrowly on the connection between school leaders' work and teachers' classroom work. Leadership practice, however, might connect with teaching and learning through a variety of

different activities that are linked directly to students, teachers, materials, or some combination of the three. Additionally, studies in school reform address the need for trust within an organization. Fullan (2008) stated that "transparency helps employees, customers and other stakeholders develop trust in the organization, which is critical to long-term survival" (p. 102).

Finally, constructivism and diffusion of innovation, the theoretical base for this study, are discussed. The literature on the connection between constructivism and inquiry-based instruction is explored, as well as how Rogers' (1995) diffusion of innovation theory addresses integration of instruction technology lessons.

Major Theme: Educational Policy in Broad Terms

To better understand the rationale for why district policy instruments of inquiry-based instruction and technology were chosen as areas of focus for this study, a contextual background for the research location must be well established. To that end, educational policy will be discussed through the lens of the democratic right for all students to receive a quality education. When asked to articulate the purpose of K-12 education in America today, one would be hard pressed to give an answer that appeals to everyone. Bierlein (1993) stated:

> Many citizens want a return to the basics, but they also want art, music, computers, sex education, foreign language, athletics, vocational education, and a dozen other topics. Multiple constituencies need to be served, each wanting education to fulfill its version of the American dream.

Without a common purpose, policies are often written and pushed based on different values, ideologies, and perspectives.

The participants and the policymakers at the setting for this study, as a community, believed that there is no one-size-fits-all education (Cuban, 1988; Gregory, & Chapman, 2002; Hornby, 1999; Pratt, 2002). The policy discourse that was taking place at the research site could be closely connected to the democratic values proposed in Fowler (1990, cited in Bierlein, 1993). These values include Quality/Excellence—where the standard is set for the best possible outcome; Equality/Equity—having an "equal standing" in terms of societal rules and stations and an "equal opportunity" compared to others (Bierlein, 1993); Fraternity/Common Good—the ability to have valuable relationships with others and seriously committing to the responsibilities toward other human beings and caring about the welfare of others; Economic Growth—providing proper education to ensure a productive workforce; Efficiency—receiving the highest value for the investment, whether it be in people, money, or time; Individualism—the need to strive for self-reliance and to advance self–interests, sometimes at the expense of others; and this policy discourse was loosely connected to the democratic value of Liberty/Freedom—the ability to make choices without restraint and the ability to choose a direction in life and the future (Fowler, 1991).

Fowler (1990) defined policy as "the dynamic and value-laden process through which a political system handles a public problem." The research setting is like a political system that is trying to handle the public problems of low student achievement and financial shortfall by mandating policy. Policy action seems to be focused on a well-

documented problem. There has been a multifaceted approach to addressing these problems within the district that was studied. To name a few of the approaches used, the research setting has instituted Professional Learning Communities, common syllabi and assessments, instructional frameworks with a specific pedagogical approach anchored in Principles of Learning (POL) originating from the work of Lauren Resnick and the Institute For Learning (IFL), a blended instructional delivery model in grades 9-12, and technology integration in grades 6-8. The philosophy of problem solving in the research setting appears to be based on the Rationale Perspective; policy is directed by data-driven analysis of problems and potential solutions (Malen & Knapp, 1997).

Fowler (1990) stated, "Policy agenda is usually set by powerful politicians, such as presidents, governors, and legislators." In the case of the site of this research, all the aforementioned efforts have been coordinated through the vision and leadership of district policymakers, the schools' powerful politicians. Fowler continued:

> Like a game, the policy process has rules and players. Like a game, it is complex and often disorderly. Like a game, it is played in many arenas and involves the use of power. And like a game, it can have winners and losers.

Unfortunately, in the district in this study, the teachers feared that policies of inquiry-based instruction and technology integration would make them "losers" in this policy game because of distrust and the belief that accountability may lead to job losses for teachers who do not adhere to and comply with the policies. Furthermore, the literature reviewed regarding the setting of this research suggests that policymakers had a history of implementing reforms without garnering the support of the community. Conversely,

the policymakers (i.e., district leaders and teacher leaders who were a part of policy creation) believed the actions taken were justified in that they were acting according to best practices. It was their contention that their actions were in line with ideas espoused by Bierlein (1993): "The goal of liberalism is to enhance social equality, specifically for the poor and the powerless, through reliance of a strong central government." The ideals of American liberalism, which highlight the rights for students to receive a high quality education that prepares them to succeed in school, work, or life, are very much at the center of this study. In the setting in which this study took place, district policymakers represent that "strong central government" that is working to secure these rights by mandating specific changes in teacher practice.

Subtheme: Roots of Current Federal and State Policy

In 1957, the launching of the Sputnik satellite prompted a call to action that successfully put greater emphasis on mathematics and physical science instruction in our nation's schools. Bob Samples, author of *The Metaphoric Mind: A Celebration of Creative Consciousness*, tells of the impact in the United States of the launch of Sputnik in 1957. The immediate response was to call education to account for what was considered a national "disgrace" (Tinkler, 1993). Policymakers at all levels strove to restore national supremacy in mathematics, sciences, technology, and economics through education. Today, it is commonly believed that the laser-like focus on math and science has waned. However, in a world made infinitely smaller and more competitive by the technological advances of the last half-century, the calls to find workable solutions to the major challenge of preparing students for technical careers in today's economy grow

increasingly louder (NEAP, U.S. Department of Education, 2006). Although the scrutiny by policymakers of the K-12 educational arena diminished as the U.S. seemed to have "won" the race to space, schools have remained front and center in the debate of how we can maintain national viability through the education of our youth beyond the subjects of math and science.

Since the 1980s, U.S. policymakers have taken up more complex social problems, using policy in an attempt to leverage change in local behavior and alleviate a variety of social ills. Perhaps nowhere have these ambitions been more evident than in education; federal, state, and local government policymakers have attempted wide-ranging changes in K-12 schools and classrooms in an effort to improve learning opportunities for all American children (Spillane, 2004). This reform deluge has included proposals for school-based management, restructuring, parental choice, state standards, policy alignment, whole school reform, and charter schools (Spillane, 2004). In this unprecedented era of governmental oversight, Donlevy (1999) remarked that the current K-12 climate was characterized by a zeal for identifying academic standards, setting them, measuring high performance, and delivering consequences to those unable to master the new mandates. His remarks still ring true today.

Subtheme: Federal Policy

Although it has been around for a long time, standards-based educational reform and accountability came to the fore of American educational policy in the early 1980s, with the National Committee on Excellence in Education's (NCEE) open letter to the American people, *A Nation at Risk* (NCEE, 1983), which laid out a forceful set of

recommendations, including rigorous definitions of content standards in English, mathematics, science, social studies, and other basic subjects, as well as rigorous and measurable standards for student achievement and instructional quality (Junker et al., 2009). The reformers who were proponents of the standards-based reforms suggested that reform initiatives of the 1970s and 1980s did not go far enough to produce substantial improvement in instruction, but reinforced the school system's emphasis on basic skills (Smith & O'Day, 1991, cited in Spillane, 2004). The ideas outlined in the policies of the 1980s were codified 10 years later into eight national goals in the federal Goals 2000: Educate America Act of 1994 (King, 1994), which emphasized student achievement in both basic and challenging subjects and specifically mentioned teacher education and professional development. The most recent coding took place through the federal No Child Left Behind Act of 2001 (NCLB, 2002; Junker et al., 2009). Although there has been subsequent research proving that *A Nation at Risk* data were manufactured to create an educational and economic "crisis" (Berliner & Biddle, 1995), much of educational policy is still driven by the conclusions of that report. Within the confines of this study, I do not intend to judge the trustworthiness of the data from which the policies are made, but rather to understand how that policy is lived out in the day-to-day work of classroom teachers and districts.

Subtheme: Federal Policy and Technology

Studies have shown that the integration of computer technology into instruction and its effect on student learning is of increasing interest to stakeholders such as policymakers, administrators, educators, students, and parents (Adkins, 2009;

Christensen, Horn, & Johnson, 2008; Levin & Arafeh, 2003). Today, a major portion of most schools' discretionary budgets are directed toward technology acquisition and implementation, and sustainability (Oppenheimer, 2003; Semich & Runyon, 2002). To underscore the heightened expectation for computer use, No Child Left Behind requires that every student be technologically literate by the completion of middle school. It is believed that the experiences of digital natives, those students born in the digital age, have not only changed the way young people communicate, socialize, and entertain, but also have fundamentally altered the way they approach learning (DeDe, 2005). They are technology savvy, confident in the positive value of technology, and reliant upon technology as an "essential and preferred component of every aspect of their lives" (U.S. Department of Education, 2004, p. 19, as cited in Lei, 2009).

> We cannot assume that our schools will naturally drift towards using technology effectively. We must commit ourselves to staying the course and making the changes necessary to reach our goals of educating every child. These are ambitious goals, but they are goals worthy of a great nation such as ours. Together, we can use technology to ensure that no child is left behind. (President George W. Bush, U.S. Department of Education, 2004)

To accomplish the aforementioned goal, NCLB set requirements for state and district technology plans (Lecker, 2005). Additionally, the National Educational Technology Plan was established in 2004 to enhance effective instruction with technology (Blankson, Keengwe, & Kyei-Blankson, 2010). As argued by Oblinger and Oblinger (2005), the increase in the availability of technology in schools provides for the

needs of the *Next Generation learners*, a term often used to refer to students born after 1990.

One way that states receive funding from the national government to implement technology-related projects is E-rate discounts. E-rate discounts were created as part of the Federal Communications Act of 1996. E-rate reduces the cost of telecommunications services, Internet access, and internal connections. The funds for this program fall under the oversight of the Federal Communications Commission (FCC). The-day-to-day operations are managed by the Universal Service Administrative Company (USAC), a subsidiary of the Schools and Libraries Division (SLD). Libraries and schools that qualify for the E-rate dollars receive between 20% and 90% funding for new or existing network and telecommunication services. The amount of discount received is determined by the number of students who receive free and reduced lunch through the National School Lunch Program and whether the schools or libraries are located in urban or rural communities (AT&T Intellectual Property, 2010, cited in West, 2009; Grant, 2011).

Subtheme: Federal Policy and Inquiry

Although federal policy has not explicitly required schools to use constructivist or inquiry-based instruction in the classroom, the language in the national core content standards for history/social studies suggests constructivist expectations. To explain, NCLB expects that students are able to solve complex problems in an increasingly competitive global economy. Breaking it down further, the newly adopted Common Core State Standards imply a student-centered classroom. For example, the Council of Chief State School Officers (CCSSO) recently published a document aptly named *Vision for*

College, Career, and Civic Life (C3) Framework for Inquiry in Social Studies State Standards. This document is meant to serve as a guideline for states to use in enhancing their standards for rigor in civics, economics, geography, and history in K-12 schools. At the heart of the C3 Framework is an inquiry arc—a set of interlocking and mutually supportive ideas that feature the four dimensions of informed inquiry in social studies: (a) developing questions and planning investigations; (b) applying disciplinary concepts and tools; (c) gathering, evaluating, and using evidence; and (d) working collaboratively and communicating conclusions (CCSSO, 2012). The CCSSO collaborative was very intentional in focusing on the disciplinary and multidisciplinary concepts and practices that make up the process of investigation, analysis, and explanation outlined above. CCSSO contends that the C3 framework will be informative to states interested in upgrading their social studies standards.

The goals of the CCSSO are staying true to the "mission of schools-based civic/social studies education which is to develop competent citizens who have the knowledge, skills and attitudes necessary to participate responsibly and effectively in the political and civic life of a democracy" (NCSS, 2013, p. 31).

Major Theme: States' Response to Federal Policies

According to the National Center for Education Statistics, in 2007, the federal government contributed nearly $72 billion to elementary and secondary education, largely through state payments (Institute of Education Science, 2008, Table 362, cited in Ownes-Gish, 2010). Common sense dictates "There's no such thing as a free lunch," as the cliché says. The deluge of federal dollars brings with it specific expectations,

oversight, and accountability. One such legislation containing specific expectations, oversight, and accountability is the NCLB Act of 2001. The purpose of NCLB was to "improve student achievement and to change the culture of America's schools" (U.S. Department of Education, 2004, p. ix). Furthermore, the program was focused on ensuring that every child in schools receiving federal funds met state-defined educational standards by the end of the 2013-2014 school year.

Before one can examine the districts and the classrooms within those districts for evidence of federally mandated expectations in inquiry and technology, it is important to understand how the expected standards came into existence by looking at how the state interacts with such mandates. Specifically, this section of the literature review discusses the how the State of Michigan, the state in which this study is situated, has responded to federal mandates in inquiry and technology.

Literature on the process of policy creation and implementation is plentiful (Elmore & McLaughlin, 1988; Fullan, 2004; Howard, 1999). In this age of ever-increasing federal policymakers' appetite for instructional policymaking, Spillane (2004) explored state and national standards from the perspective of district policymakers and teachers. While state efforts at accountability appear to have been weakening due to budget constraints, policy instruments such as measurable growth on academic performance indexes have become fundamental components of federal efforts under the No Child Left Behind Act that is a high-stakes accountability measure (EdSource, 2003).

Being cognizant of the possible sanctions that may be applied for failing to meet the expected outcomes outlined in NCLB, which was more comprehensive than previous

acts (Gastic & Gasiewski, 2008), state policymakers have taken measures to ensure compliance. According to NCLB, state-level Boards or Departments of Education were mandated to demonstrate compliance with the public law at the end of each school year. The plans for such compliance activities were created based on the interpretation and current practices of that state. Spillane (2004) underscored this point, stating that the actions taken contradict studies that suggest federal policy goes unheeded by states. "Recent research suggests that bureaucrats [state- and district-level administrators] tend to be hard working; they do not typically work to undermine policy directives from above" (Brehm & Gates, 1999). The Michigan Department of Education (MDE) is working to meet policy directives.

> To the extent possible, MDE will work within any national academic or curricular standards consortium in which Michigan participates (e.g., mathematics, English Language Arts, etc.) to incorporate the National Educational Technology Standards for Students (NETS-S) and 21st Century Skills where appropriate. (MDE Technology Plan, 2010)

States have continued to interpret the particulars of the Act within their own context. Using these interpretations, states have created unique plans for implementing inquiry and technology in their schools.

Subtheme*:* Technology

Title II, Part D of the No Child Left Behind Act (NCLB) legislation requires states and districts to have a current and approved educational technology plan that outlines how the funds received from the federal government will be used (Broadening

Education through Technology, Section 2414, Local Application). The objectives outlined in the states' educational technology plans are intended to focus current efforts aimed at utilizing the limited state-level resources. To that end, a substantial degree of motivation for the objectives stated by state educational technology plans is found in the National Educational Technology Plan (U.S. Department of Education, 2004) and in the No Child Left Behind (NCLB) Act. Specifically, the State of Michigan has identified the following objectives:

> *Leadership:* Michigan will provide leadership for educational technology in order to expand and develop transformative learning environments that increase student achievement.
>
> *Digital Citizenship:* Every Michigan student will be proficient in technology and will demonstrate the ethical use of technology as a digital citizen and lifelong learner.
>
> *Student Learning:* Every Michigan student will have meaningful technology-enabled learning opportunities based on research and best practice that include virtual learning experiences.
>
> *Data-Driven Decisions:* Every Michigan educator will use data effectively for classroom decision making and school improvement planning through an integrated local and statewide decision support system.
>
> *Professional Learning:* Every Michigan educator will have the technology competencies to enable the transformation of teaching and learning to improve student achievement.

Broad Access: Every Michigan classroom will have broadband Internet access to enable regular use of worldwide educational opportunities.

Shared Resources: Every Michigan educator and learner will have equitable and sustained access, through statewide coordination and support, to resources necessary to transform teaching and learning through educational technology.

Funding: Michigan will develop innovative methods of funding to transform and sustain teaching and learning through educational technology and build local, regional, and statewide capacity. (MDE Technology Plan, 2010, p. 4)

Within the context of this study, not all of the stated objectives above are discussed. However, some discussion of the objectives addresses digital citizenship, student learning, and professional learning, as these are directly connected to how the state policy plays out in the daily practices of teachers. It is expected that every student in Michigan will achieve a certain level of proficiency in the use of technology and use it ethically as a learning tool. To accomplish this, the State of Michigan looked to the overarching skills outlined in the National Education Technology Standards (NETS) and Technology Standards for School Administrators (TSSA). First, Michigan Curriculum Framework (MCF) benchmarks and content expectations contain essential elements of the Michigan Educational Technology Standards (METS) and 21st Century Skills. Second, the state has the set the goal to provide effective technology-enabled environment that facilitates opportunities for project-based, challenge-based, and "real world" experiences (MDE Technology Plan, 2010, p. 5). Furthermore, there have been specific expected performance indicators for each of the numerated goals, such as the

indicator for the goal of technological proficiency: "Every Michigan student will complete one credit-earning course or learning experience that incorporates online learning into instructional delivery as part of his or her successful completion of the Michigan Merit Curriculum's (MMC) high school graduation requirements" (MDE Technology Plan, 2010, p. 5). The outlined fundamentals characterize target technology proficiency and integration levels in that technology use is embedded to create challenging and engaging learning experiences that promote problem-solving, critical thinking, and self-directed learning. The expectations for technology have the potential for inquiry depending on how one reads the goal. The expectations of NCLB, NETS, and TSSA are aimed to improve the capacity and likelihood of teachers who are teaching in schools receiving federal and state educational technology funds to integrate technology effectively into the curriculum and instruction (Lecker, 2005). Contextually, as pertains to this study, in compliance with federal law, the State of Michigan created a technology plan to aid in meeting federal expectations. Michigan Department of Education Technology Plan 2010 states:

> MDE, with the help of its partners, will align and integrate the Michigan Educational Technology Standards for Students (METS-S) and 21st Century Skills within the Michigan Curriculum Framework (MCF) benchmarks and the High School Content Expectations and Grade Level Content Expectations (HSCEs/GLCEs).

Subtheme: Inquiry

Inquiry-based instruction is buttressed by the tenets of Constructivist Theory, which indicates that learners construct knowledge from prior knowledge, they learn through authentic learning opportunities, and they attain information through rich and multiple perspectives (Lambert, 2002; Matusevich, 1995). Notable constructivists like Vygotsky, Resnick, and others theorize that children develop through social interaction; this interaction involves a variety of media such as books, computers, and toys (Leong & Bodrova, 2001).

Based on the description of the technology integration and inquiry-based instruction articulated in this study, one can understand why the State of Michigan considers inquiry and technology high-yield initiatives through which federal and state expectations can be reached. For example, "MDE, with its partners, will work to integrate project-based, challenge-based learning, and 'real world' experiences into traditional academic classroom settings, especially those that focus on integrating science, technology, engineering, mathematics" (MDE Technology Plan, 2010).

In order to comply with the federal expectation of NCLB and the standards-based movement (i.e., National Standards for History Education), states outlined the Grade Level Content Expectations (GLCE) and High School Content Expectations (HSCE) for all subjects. Currently, a discussion is raging in light of the Common Core State Standards (CCSS), which have been be adopted by most states nationwide. The content and skill expectations outlined in the CCSS are currently measured and will continue to be measured in Michigan in high-stakes assessments in the forms of the Michigan

Educational Assessment Program (MEAP) and Michigan Merit Exam (MME). It can be argued that much time is spent preparing students for standardized tests. Schoenfeld (1998, 1999) recounted a scenario in which students may memorize proofs and formulas to pass the test; however, when assessed later, these very students fail to demonstrate facility with geometric principles, even though their learning was assessed in the same manner as it previously was. Katz (1994) and Gardner (1991) attributed this discrepancy to the difference between actual learning and performance. Although it is an important topic, the pros and cons of high-stakes testing is not the focus of this study and will not be explored further.

In trying to balance the need for high stakes accountability with real learning, MDE states:

> Effective social studies instruction and assessment incorporate methods of inquiry, involves public discourse and decision making, and provide opportunity for citizen involvement. Each year, students should receive instruction that allows them to think and act like historians, geographers, political scientists and economists. (Grades K-8 Social Studies Content Expectations, MDE, 2007)

Likewise, across the nation, states like Ohio, Delaware, and Nevada have created performance indicators anchored in researched best practices. For example, the assessments are written at various Depth of Knowledge levels according to Webb's criteria:

Recall of Information: Requires students to recall and recite facts from a text.

Basic Reasoning: Requires mental processing beyond recalling information—summarizing, interpreting, classifying, predicting, comparing.

Complex Reasoning: Requires students to show a deep understanding of the text—explaining, generalizing, synthesizing, connecting, analyzing.

Extended Reasoning: Requires higher order thinking on a multi-stepped task over an extended period of time.

(Depth-of-Knowledge Levels for Four Content Areas, March 28, 2002)

The above information is not provided to debate the merits of high-stakes tests. It is provided merely as an example of how states have strived to meet the requirement of inquiry-based instruction. The state-level Boards or Departments of Education continue to look to local school districts for verification of compliance. If evaluated successfully, districts ensure the continued receipt of federal funds by a state. Since a major evaluation metric is the student achievement on standardized tests, a short discussion about technology and inquiry as they pertain to students' achievement is warranted.

Subtheme: Impact of Instructional Technology and Inquiry-Based Instruction on Student Achievement

The National Educational Technology Plan (U.S. Department of Education, 2004) posits needed technology often can be successfully funded through innovative restructuring and reallocation of existing budgets to realize efficiencies and cost savings. The new focus begins with the educational objective and evaluates funding requests—for technology or other programs—in terms of how they support student learning. Every program in No Child Left Behind is given an opportunity for technology funding, but the focus is on how the funding will help attain specific educational goals (p. 40).

Schools have invested heavily in programs and resources to aid in increasing student achievement. One such resource is educational technology. Russell, Bebell, O'Dwyer and O'Connor (2003), and O'Dwyer, Russell, Bebell, and Tucker-Seely (2005) reported the national expenditure on technology to be approximately $850 million, of which $600 million was spent on software and $250 million on hardware. Although expenditures in educational technology have increased in recent years, there are varying opinions regarding the returns on the investment. Policymakers believe that providing students access to technology will increase engagement and raise achievement. The proponents of educational technology tout its merit in helping students learn and achieve at higher levels (Mayadas, 2001; O'Toole & Absalom, 2003; Wenglinsky, 1998). Those who oppose large-scale investments in educational technologies are both emboldened and infuriated by the knowledge that, despite the enormous amount of dollars spent on computer-related technologies, only a few states such as Maryland and South Carolina collect data about students' technology proficiency. Research by Cuban (2001, cited in O'Dwyer et al., 2005) suggests that evidence between technology use and student achievement on standardized tests is scant. A meta analysis by Norris, Hossain, and Soloway (2012) also found, even though the research is inconclusive about a true link between technology and student achievement, conditions under which technology is used matter. Russell et al. (2003) argued that to better gauge the return on investment, a comprehensive review of the technology's impact on students must include an assessment of students' computer skills.

The International Society for Technology in Education (ISTE) is a not-for-profit organization dedicated to supporting the use of information technology to aid in learning and teaching of K-12 students and teachers. One of many projects sponsored by the ISTE is the Center for Applied Research in Educational Technology (CARET). A study conducted by CARET focusing on how student achievement is impacted by technology in the classroom found a strong correlation between the use of technology and student learning as well as performance in the areas of content attainment, development of higher-order thinking and problem-solving skills, and workforce preparation. Furthermore, Cradler, McNabb, Freeman, and Burchett (2002) found that students taught by teachers who intentionally integrate technology in their instruction outperform their counterparts in tasks that require higher-order thinking skills. Corroborating the work of CARET, Bain and Ross (2000), in their study of SAT performance in a New Hampshire school, found that students who were exposed to a technology-rich classroom environment scored an average of 94% higher than those who were not.

Taking into account factors of race, ethnicity, socioeconomic status, class size, and teacher preparation—reasons often cited as predeterminants of poor student performance in school, studies of students who fit the stated statistics have shown higher student achievement on standardized tests as well as an overall knowledge increase (Becker, 1998, cited in Kimble, 1999; Wenglisky, 1998). Technology that is properly integrated in instruction and inquiry in the classroom does impact student achievement. Cradler et al. (2002) argued that the complexity of student writing, reasoning, and communicating of ideas is much increased when technology that promotes inquiry is used

in the classroom. They recommend that technology proficiency be one of the basics that students must have if they are to fully participate in the workforce of the 21st century. It is important to reiterate here that the research linking technology and student achievement is inconclusive.

Major Theme: District Response to Federal and State Policy

In order to address certain state standards, align policy, and bring about whole school reform, district policymakers communicate their interpretation of state policy through mandated initiatives. More often than not, school districts take on numerous initiatives in an attempt to achieve their goal of educating all students. Studies such as Abrahamson (2004), Elmore (2004, 2007), Fullan (2006), and Spillane (2006) deal specifically with the issue of too many district-mandated initiatives. Abrahamson (2004) argued that quick-fix changes to turn around failing schools often exhaust the teachers and principals, and improvement efforts are not sustained over time (p. 57). Often, the consequence of these quick-fix efforts is change-related chaos—"the continuous state of upheaval that results when so many waves of initiatives have worked through the organization that hardly anyone knows which change they're implementing, or why—which leads, in turn, to loss of organizational memory."

The work of Spillane (2004) considers the interplay of state and school districts' policymaking and explores how this interactive policymaking is evidenced in the classrooms. District and school administrators, curriculum specialists, and teachers craft district instructional policy (Kirst & Walker, 1971; Spillane, 2004). It can be argued, although studies in educational policy often do not show it, that local officials have a

great deal of discretion vis-à-vis federal and state policies (Lipsky, 1980; Spillane, 2004). For example, NCLB specifically states that local curricula and assessments are to be aligned with state guidelines. As policy moves from the Capitol to the classroom, school districts work to figure out what the policy means to their work (Spillane, 2004). Additionally, recent implementation studies suggest that teachers and administrators frequently not only heed higher-level policies, but also work diligently to implement these policies (Cohen & Ball, 1999; Firestone, Fritz, & Broadfoot, 1999, cited in Spillane, 2004). In this study, two initiatives aimed at ushering the changes desired by K-12 district policymakers are technology integrated lessons and inquiry-based instruction.

Major Theme: Beliefs, Knowledge, and Practice with Inquiry-Based Instruction and Technology

Decades of research have suggested that classroom practices were resilient to policy and other reform initiatives (Cuban, 1993; Fullan & Stiegelbauer, 1991; Meyer & Rowan, 2006; Tyack & Tobin, 1994). Prior policies that sought modest change compared with standards often failed to get beyond the classroom door (Spillane, 2004).

The ever-evolving perception about teachers and their relationship with technology is well documented in educational technology literature. The majority of the perceptions are grounded in individual teacher beliefs about the craft of teaching and the role technology plays in it. Researchers have found that beliefs determine a person's attitude (Bodur et al., 2000). A comprehensive chronicling of the progression of research in teacher use of technology was conducted by Lei (2009). Whether or not a true characterization of teachers, studies by Bryson and De Castell (1998) and Benson, Mannes, Pittman, and Ferber (2004) associate teachers with Luddites in the Industrial

Revolution who destroyed machines. The portrayal of teachers' response to technology is continued by Harris and Grandgenett (1996), Marcoulides (1989), McInerney, McInerney, and Sinclair (1994), and Paivi (1992, cited in Lei, 2009), who document teachers' feelings of anxiety when it comes to integrating technology into instruction. Building on the aforementioned body of research, Cuban (1996) and Lei (2009) described teachers as gatekeepers, because they decide what technologies may enter the classroom and whether or how they could be used. Overall, teachers are characterized as reluctant and unwilling to use new technologies (Eteokleous, 2008; Lei, 2009; MacMillan et al., 1997). It can be argued that the determining factor for the willingness or reluctance to use technology or inquiry-based instruction is the teacher belief about technology. Teachers' beliefs may include their educational beliefs about teaching and learning (i.e., pedagogical beliefs) and their beliefs about technology (Ertmer, 2005; Ertmer & Ottenbreit-Leftwich, 2010; Windschitl & Sahl, 2002).

It would behoove school policymakers who are employing innovative uses of educational technologies and inquiry-based instruction to listen to research findings regarding policy implementation. Research has also been conducted to explain the success or failure of disruptive innovations from the employees' perspective. In the following process of implementation for the disruptive idea, instead of accepting one-size-fits-all policies, policymakers should spend time ensuring that capable people work in organizations with processes and values that match the task. One factor that influences teachers' willingness to embrace the use of technology in everyday classroom practice is closely connected to how they see it helping students meet the standards.

For example, a study in Australia that investigated the perceptions of students and teachers toward the use of portable computers at a secondary school found that the majority of teachers believed that computers would not lead to better understanding or faster learning (Newhouse, 2001, cited in Bodur et al., 2000).

As demonstrated above, teacher beliefs, knowledge, and practice are closely connected to how instruction is carried out in classrooms across America. Knowledge and experiences are integrated into a web of interdependent relationships—what psychologists refer to as scripts and schemas. We filter new incoming information through these scripts (Rumelhart, 1980; Spillane, 2004). Furthermore, the usability of knowledge depends in part on the situation in which it is acquired. To explain, constructivism's apprenticeship model of learning may best fit what Brown and his colleagues called "cognitive apprenticeship." In keeping with this thinking, teachers need to have experiences that resemble the environments in which they work. If learning is to affect behavior, it must not only change knowledge and beliefs, but also occur in or be linked to the contexts in which the learning is to be used (Brown, Collins, & Duguid, 1989; Resnick, 1988, cited in Spillane, 2004).

Major Theme: Leading Organizational Change

In discussing federal and state education policy with respect to technology and inquiry, an understanding of how organizations change is important. The literature is clear: leading change is not a linear process. Districts have responded to state interpretations of federal policy by mandating change within their systems through policy development. This trickle-down effect is not a new phenomenon. School districts have

been making policy for decades and have not decreased such action because state policies have increased. Spillane (2004) stated that district officials make sense of state policy initiatives as makers of local policy about instruction, rather than as implementers of state policies. Effective schools are distinguished by their research and data-driven decision-making process. Research about how schools make decisions regarding policy implementation abounds (Spillane, 1996; Spillane, 2000; Stone, 1997). In addition, much has been written about how schools change (Elmore, 2005; Fullan, 2008; Schachter, 2005) and how teachers' beliefs and attitudes about the teaching and learning effect change (Battista, 1994; Fang, 1996; Tyack & Cuban, 1995). There are also few studies that address federal/state mandates or policies regarding school reform and their manifestation at the district level (Little, 1989, cited in Spillane, 2004).

In *Coming Even Cleaner about Organizational Change*, Patterson (2003) quotes Fullan (1999): "'Re-culturing' is the name of the game. Transforming culture, changing what people in an organization value and how they work together to accomplish it, leads to lasting change" (p. 18). Patterson also refers to Barth (2002) to corroborate his ideas about organizational change, stating, "A school's culture has more influence on life and learning in a school (school district), than the president of the country, the state department of education, or any school district's senior administrator" (p. 8). It is essential to understand organizational culture if you want to make changes to how work is done, what type of work is being done, or at the broadest level, to affect the organization's standing (Schachter, 2005, cited in Patterson, 2003). Additionally, what an organization believes, what it says, and what it does is critical in implementing lasting

change. This is optimal organizational climate, which is defined as one that openly shares ideas and practices while meshing employee and organizational values (Fullan, 2008, p. 45). Within each of these broad ideas, an organization asks these questions: What is important? What is right? and What is true? (Patterson, 2003).

Collaborating with Peterson (2002) on a discourse about change in schools, Elmore (2006) argued that changing the structure of a school district and school building does not result in changed practice. He further criticized how schools try to change by putting an enormous amount of energy into changing the structure, such as new bell times, attendance policies, and discipline codes, but usually leave instructional practices untouched (p. 4). One of the problems with the usual approaches to change in schools as organizations is that buildings often "move the boxes around on the organizational chart, to fiddle with the structures" (p. 7). Elmore pointed out that school districts are attracted to these types of demonstrative changes largely because they are visible and easier to do than making the hard changes that deal with instructional practice. For districts that are serious about making changes that impact the classroom, Kotter (2002, 2008) described eight proven steps for leading substantive change initiatives:

1. Create a sense of urgency.
2. Pull together a guiding team with the needed skills, credibility, connections, and authority to move things along.
3. Create an uplifting vision and strategy.
4. Communicate the vision and strategy through a combination of words, deeds, and symbols.

5. Remove obstacles, or empower people to move ahead.
6. Produce visible signs of progress through short-term victories.
7. Stick with the process and refuse to quit when thing get tough.
8. Nurture and shape a new culture to support the emerging innovative ways.

Likewise, exemplary leadership practices that instill change include "challenging the process, inspiring a shared vision, enabling others to act, modeling the way, and encouraging the hearts of your stakeholders" (Kouzes & Posner, 1995). According to the work of Firestone (1989, cited in Spillane, 2004), policies fail to get implemented because the policy is unclear or weak or it does not fit the interests of local officials. Independent-thinking local officials are thought to intentionally ignore or selectively enforce policies that best fit their interests and agendas. Policy implementation in districts rests squarely on two role groups: central office leaders and building principals.

Subtheme: Central Office's Role in Leading Policy Implementation

Waters and Marzano (2006, 2007) suggested that school leaders have a significant impact on student achievement when they focus their efforts on collaborative goal-setting sessions involving multiple constituencies that identify non-negotiable goals with a broad but common framework for classroom instruction. They must also secure the support of the Board of Education, parents, and the community throughout this process. As leaders, they must monitor district goals and provide the necessary resources to support those strategies designed to improve outcomes (Eaker, Dufour & Burnette, 2002). Furthermore, Collins (2001) argued,

> The real path to greatness, it turns out, requires simplicity and diligence. It requires clarity, not instant illumination. It demands each of us to focus on what's vital—and to eliminate all of the extraneous distractions. School leaders must focus on what is vital, monitor it, and celebrate the successes no matter how small.

To that end, districts have made major changes in their hiring practices. The changes, however, did not only affect the hiring of teachers; they also affected the hiring of principals (Rammer, 2007). School districts realized that principals leading schools to success as measured by NCLB needed a different skill set than in years past. As noted by an extensive study at the University of Michigan, principals need to be able to invoke change in their staffs, handle the "increased demands for documentation" (Abernethy, Bouwens, & Van Lent, 2010), "become expert[s] in best practices in curriculum and instruction," and under Title IX, Part A, Section 9109 (34) of the Act, "provide learning opportunities for all staff to increase student achievement" (cited in Ownes-Gish, 2010, p. 97).

Despite the enormous body of research on the indispensable role of leadership in policy implementation, literature on schools and school change offers many examples of leadership in opposition, in which formally designated leaders and teachers perform leadership routines that are intended to promote different or contradictory goals (Firestone, 1979, cited in Spillane, 2006). One reason has to be that effective teaching and instructionally focused leadership are still largely voluntary (Elmore, 2000). Fullan

(2005) postulated that changing current practice will require the establishment of a new set of results-oriented "leadership standards . . . at all levels" (p. 34).

In essence, principals play a major role in making sure federal, state, and district policies are adhered to and implemented with fidelity. The question of exactly how essential a role the principal plays in policy implementation through instructional supervision and holding teachers accountable needs to be addressed. The following subtheme explores this notion further.

Subtheme: The Principal's Role

> In many ways the school principal is the most important and influential individual in any school. . . . It is his leadership that sets the tone of the school, the climate for learning, the level of professionalism and morale of teachers and the degree of concern for what students may or may not become. He is the main link between the school and the community and the way he performs in that capacity largely determines the attitudes of students and parents about the school. If a school is a vibrant, innovative, child-centered place, if it has a reputation for excellence in teaching, if students are performing to the best of their ability, one can almost always point to the principal's leadership as the key to success. (U.S. Congress, 1972, p. 56, cited in Lyons, 2010)

The above quotation from the U.S. Congress encapsulates how important principals are in the success of schools. Furthermore, principals, teachers, and district and state leadership were urged by NCLB to work in one accord to ensure that no child in public education was left behind; however, harmony starts and ends with leadership

(Covey, 1990, cited in Russell, 2001). If the principal believes in the initiatives or policies being propagated, a single school has the power to "create a pocket of greatness," Collins (2001) writes, without having to wait for the school, district, state, or provincial leaders "to get it" (p. 104). The most effective principals demonstrate the major aspects of being effective change agents, as outlined by Fullan and Ballew (2001), who indicated that they:

- Provide resources for their schools,
- Communicate effectively with all stakeholders,
- Embrace resistance as a time to learn or discuss,
- Maintain a visible presence, and
- Build and sustain relationships inside the school and with community stakeholders. (cited in *Educational Leadership, 58*(8), 16-20)

If the literature on principal leadership proves true, as pertains to this study, principals' influence or impact on how teachers experience mandated changes in inquiry-based instruction and technology is important

Major Theme: Theoretical Foundations

Subtheme: Diffusion of Innovation/Adoption Theories

Organizations in today's hypercompetitive world face the paradoxical challenges of "dualism," that is, functioning efficiently today while innovating effectively for tomorrow. Organizations have to understand and learn how to manage the dynamics of innovation that underlie both disruptive and sustaining innovations (Paap & Katz, 2004).

School districts are not exempt from this inconsistency. One of the most exciting times in education is the implementation of new programs and technology.

> Getting a new idea adopted, even when it has obvious advantages, is difficult. Many innovations require a lengthy period of many years from the time when they become available to the time when they are widely adopted. Therefore, a common problem for many individuals and organizations is how to speed up the rate of diffusion of an innovation. (Feliciano, 2006, p. 1)

There is always the danger, however, of the enthusiasm for the innovative program being squelched by the perceptions of stakeholders.

In his study, Straub (2009) wrote that Everett Rogers' 1962 work, *The Diffusion of Innovations* (and, subsequently, numerous later editions), has become arguably the most influential book in the area of understanding how innovation infiltrates a population (or not). Drawing from a wide range of research crossing fields of sociology, education, psychology, geography, and others, Rogers (1995) provided a comprehensive structure for understanding individual adoption and, collectively, diffusion. Rogers' theory is particularly important because it has influenced numerous other theories of adoption and diffusion (Boyne, Gould-Williams, Law, & Walker, 2005; Deffuant, Huet, & Amblard, 2005; Venkatesh, 2006; Venkatesh, Morris, Davis, & Davis, 2003).

Everett Rogers' diffusion theory (1995) aims to explain how innovations permeate social networks. Researchers have applied diffusion theory to many disciplines, some of which include education, health care management, technology use, and social behavior. This theory is applicable to the integration of technology into instruction and

inquiry-based instruction in that it explains the stages of innovation adoption, rate of adoption, and the effects of the innovation on the adoption process and the varying degrees of adoption (Fuller, 2000; Van Braak, 2001). Decision process is most critical if someone is to adopt any type of innovation. Over time, as one contemplates whether to adopt an innovation, he or she undergoes the following innovation adoption progression, which entails five stages: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation.

First, before one can identify an innovation to adopt, the need for such innovation must be specified. Due to the natural process of trying to solve a problem, one searches and becomes aware of an innovation; the solution seeker dedicates time to better understand its characteristics or functions and determines if it will suit its intended purpose. Rogers, Medina, Rivera, and Wiley (2005) called the aforementioned process the *knowledge* stage. Since individuals filter information through personal worldviews, as a consequence, there exists a certain level of individual bias as one believes that he or she needs the said innovation. This perceived need is referred to as *selective perception*.

Interestingly, the second phase of the adoption decision is the *persuasion* stage. During this stage, an individual seeking a solution forms a favorable or unfavorable attitude toward the identified innovation. This seems counterintuitive in that one would see the selective perception as having formed a concrete opinion one way or the other about the innovation. During this period, the adopter actively seeks information about the innovative resource, deciphers it, and decides if it is important. Because most individuals

are a part of a social network, the investigating adopter will seek counsel from peers, looking for reassurances that he or she is going down the correct path.

As it pertains to this study, Ertmer (2005) argued that the decision of whether and how to use technology for instruction ultimately depends on the teachers themselves and the beliefs they hold about technology. For example, in an investigation of one elementary school in the United States, Ertmer et al. (1999) found that teachers' beliefs about technology in the curriculum shaped their goals for technology use. Teachers who viewed technology as merely "a way to keep kids busy" did not see the relevance of technology to the designated curriculum. Computer time was commonly granted after regular classroom work was done as a reward for the completion of assigned tasks. To these teachers, other skills and content knowledge were more important. Similarly, other researchers have found teacher beliefs about technology to be a major barrier to technology integration (Windschitl & Sahl, 2002). Reading the preceding sentences, one may incorrectly conclude that teachers are against technology and/or trying out innovations. One may also assume that teachers are opposed to taking risks. Fullan (2008) contended risk taking is a necessary component of problem solving; however, fear of punitive consequences decreases the likelihood of this positive organizational behavior. Therefore, practical advice for leaders is "don't roll your eyes on day one when you see practice that is less effective by your standards; instead, invest in capacity building" (Fullan, 2008, p. 58). Fullan continued, "Successful organizations mobilize themselves to be all over the practices that are known to make a difference" (p. 77).

Subtheme: Constructivism—Inquiry-Based Instruction

Since the inception of the NCLB legislation, there have been major changes in how curriculum is organized at the federal, state, and district levels. Although "NCLB forces schools to teach the test" (Fitzgerald, 2009, para. 5), districts have discretion as to which instructional framework they adopt to teach the mandated standards. There are studies whose sole purpose is to define constructivism in terms of its tenets (Albanese & Mitchell, 1993; Aspy, Aspy, & Quimby, 1993; Dewey, 1916; Glickman, 1991, cited in Van Driel, Beijaard, & Verloop, 2001). There are even studies that argue that not all ways of knowing can be taught through constructivist methods (Kragh, 1998; Olssen, 1996; Peou, 2002). Because this study employs the phenomenological approach in trying to understand the lived experiences of teachers as they teach using technology and inquiry in social studies classes, constructivism as a theory is addressed in terms of how instruction may appear in a history/social studies classroom.

Constructivism is a philosophical view on how we come to understand or know. Although not a new concept, Bodner (1986) succinctly sums up the ideas of Rorty (1991) by stating, "Knowledge is not a representation of the real world or a 'match' between knowledge and reality but rather a collection of conceptual structures that are adapted, or viable, within a person's range of experience." Using primarily the work of Dewey and Piaget that learners construct their own knowledge, in that stimulus for learning is some experience of cognitive conflict or "puzzlement," Savery and Duffy (1995) agreed that knowledge building is aided by multiple experiences. Additionally, Von Glasersfeld (1989) stated that "cognitive change happens as a result of interaction with other learners

who may have different understandings." To that point, students whose teachers incorporate collaborative learning or study groups into the classroom will have more opportunities to think reflectively as they apply new knowledge. For students to become engaged in a subject, they must be both immersed in it and intrigued by it—and they must believe that their new learning has relevance to their lives. Consider why adults think critically: to solve a problem, satisfy curiosity, or increase knowledge. Rarely do we dig into learning just for the purpose of passing a test (Lent, 2006). A constructivist approach to teaching does well in bringing relevance to what is being learned. For example, in regard to guiding students through reading in the content area such as history/social studies, Ivey and Fisher (2006), reminded educators that

> Like adults, teens read because it satisfies their minds. So when we recommend books to older, inexperienced readers, we want to show them that reading can stimulate their minds—make them laugh, puzzle, empathize, question, or reconsider previously held notions. We cannot think of any other reason that students would adopt the habit of reading. (p. 17)

Beyond stimulating the mind, tasks that are organized and presented in constructivist philosophy should provide opportunities for the learners to interact with others. "Humans make meaning through sharing, discussing, exchanging, and refining experience and language" (Oblinger & Hawkins, 2006). Specifically, in a subject such a history/social studies, teachers have greater opportunities to encourage higher-order thinking and collaborative problem solving while sticking to evidence-based conversations. "The problem with many youngsters today is not that they don't have opinions, but that they

don't have the facts on which to base their opinions—Critical thinking helps us distinguish between appearance and reality" (Shanker,1995, pp. 45-46).

In the setting in which this study was situated, the policymakers used research-based rationale to institute a common instructional model as a policy instrument to ensure uniformed instructional planning across the district. Even though it was mandated, the design of the instructional model included collaborative efforts to design units of study (Lenz, Bulgren, & Hudson, 1990; Wiggins & McTighe, 2005), develop lessons, identify instructional strategies, carry out curriculum development, and foster professional networking, staying true to the understanding that inquiry process involves all students. A constructivist approach demands that students are engaged in learning.

The 5-E model of instructional design was chosen by the Carver Public Schools policy makers because it best incorporated the learning goals of engaging the students' emotions, sense of novelty, and relevance, regardless of their background. Furthermore, the district selected an issues inquiry approach because studies have indicated that when students are involved in their community and have direct experience with how decisions influence their lives, they see purpose and value in their education (Battistoni & Hudson, 1997; Niemi & Chapman, 1999; Putnam, 2000; Skocpol, 2002; Verba, Schlozman, & Brady, 1995). While developing students' understanding of civics concepts and increasing students' skills by using Content Enhancement Strategies (Lenz et al., 1990) and reading, writing, and presenting strategies, teachers will be preparing students for using an issues-centered approach to learning civics. This approach relies on "higher-level thinking [and] challenging issues-centered learning" (Caron & Gely, 2004, p. 13).

Subtheme: Designing Curriculum Systemically and Methodically to Ensure the Use of Technology

Over the years, the use of computers and other technologies as learning tools has sky-rocketed. Specifically, a plethora of hardware and software to support secondary devices used in learning has changed classroom environments (Ringstaff & Kelley, 2002). Reasons for integrating technology into daily instruction vary. School districts like Carver Public Schools rush to heed the advice of Donlevy (2006), who suggested, "As newer technologies emerge into view, students, teachers, and administrators should incorporate them into daily teaching and learning practice" (p. 122). As sound as this advice may be, however, it is important to keep in mind that technology skills alone cannot guarantee effective technology use in the classroom (Ertmer et al., 2003). Meaningful technology integration is more of a pedagogical endeavor than a technological one (Dutt-Doner et al., 2005, cited in Lei, 2009). Cognizant of research-based best practices, the district in which this study is situated heavily leaned on the work of Mishra and Koehler (2006; Koehler & Mishra, 2008a), who argued for a new understanding of the complex, situated, and interdependent nature of teachers' technology integration knowledge, termed *technological pedagogical content knowledge* or TPACK. Although evidenced in the non-blended courses, courses that were taught only in a face-to-face fashion, special attention was given to how the content was organized for consumption by teacher and students. TPACK is the intersection of teachers' knowledge of curriculum content, general pedagogies, and technologies (see Figure 2).

Koehler and Mishra (2005) recommended a learning-by-design approach to TPACK development in which educators, content experts, and technology specialists design instruction collaboratively, building TPACK as they do so (Koehler, Mishra, & Yahya, 2007).

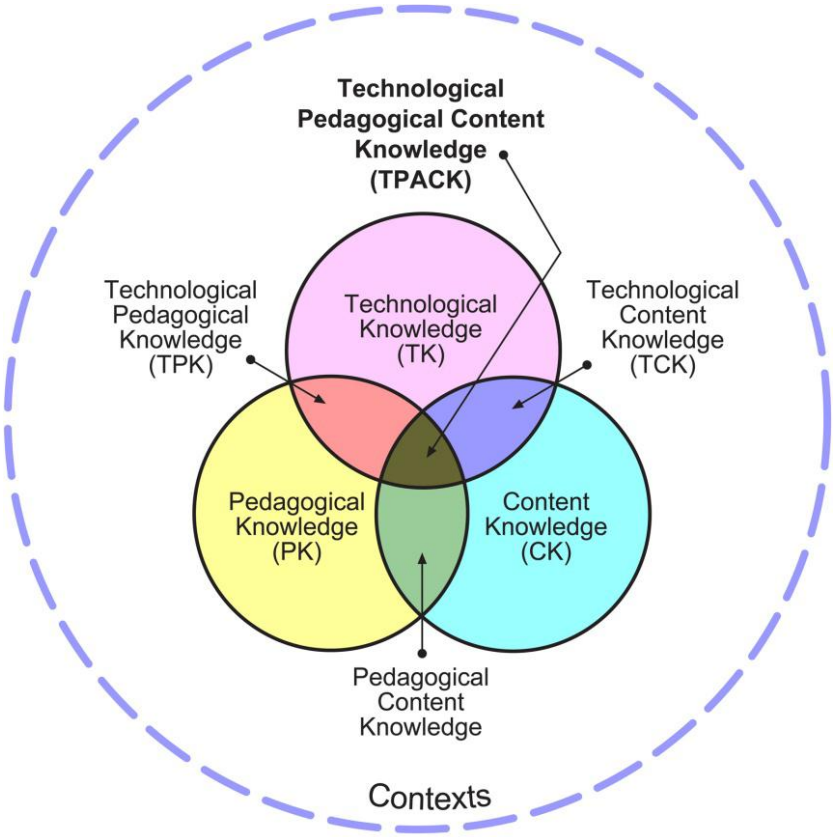

Figure 2. The TPACK framework and its knowledge components.

Major Theme: Effective Professional Development and Policy Implementation

In an effort to ensure adherence to educational policy, federal, state, and district policymakers have specific expectations for professional development. For example, at the federal level, as it pertains to technology, NCLB legislation directs states to include in

their technology plan the process through which teachers will be supported to teach using technology. For example, at the state level, Michigan requires its teachers to complete a minimum of 5 days of professional development annually, regardless of tenure status. There are an additional 15 days required for new and non-tenured teachers (Holley, 2008). The Michigan Department of Education requires that all teachers complete 36 hours of professional development each year. Because the State does not mandate the topics to be covered during the professional development time, schools have been empowered to organize professional development in creative ways. For example, districts have allocated the PD time for technology or inquiry-based instruction as long as the "participants are experiencing effective instructional practices in university-linked professional development schools, or that the PD is conducted by master/mentor teachers" (MDE, 2003). The only caveat is that local policymakers must monitor and collect data on how and when professional development is completed. Going beyond compliance and completion, districts that are intentional in making sure the professional development received by teachers is evidenced in the classroom have instituted internal mechanisms to monitor implementation.

The primary means of propagating new practices within an organization is through its mechanism for organizational learning. Research on organizational learning defines it in the following ways:

"Organizational learning means the process of improving actions through better knowledge and understanding" (Fiol & Lyles, 1985).

"An entity learns if, through its processing of information, the range of its potential behaviors is changed" (Huber, 1991).

"Organizational learning occurs through shared insights, knowledge, and mental models . . . builds on past knowledge and experience—that is, on memory" (Stata, 1989).

Organizational learning in many organizations occurs through its professional development process. In an empirical study of the effects of different characteristics of professional development on a national sample of over 1,000 teachers, Garet et al. (2001) found that both traditional and innovative types of professional development of the same duration tend to have the same effects on reported outcomes. They concluded on this basis that it is more important to focus on the features of professional development rather than its types (i.e., innovative types vs. traditional types such as study groups, or mentoring vs. formal training workshops or conferences) (Garet et al., 2001). The aforementioned research is noteworthy because Carver Public Schools professed commitment to providing professional development that was anchored in researched best practices.

Whether learning about technology or inquiry-based instruction, professional development is an important policy instrument in districts. The conventional perception of professional development in many districts is that of external consultants, district specialists, and teachers with specialized knowledge transmitting knowledge about instruction to classroom teachers in a "show and tell" manner (Spillane, 2004). An alternative understanding of professional development also exists. According to the National Staff Development Council (NSDC), quality professional development occurs

when the content and the standards being addressed engage participants in long-term learning communities guided and supported by leadership and resources. Also, quality PD must employ process standards to include evaluation, research-based decision-making processes, and skills in collaboration, as well as content that includes growth in subject area content knowledge, pedagogical skills, and dispositions about teaching and learning. It must also provide support and risk taking in which implementation of knowledge is supported by knowledgeable others, and thoughtful reflection is practiced.

The ideas regarding quality professional development presented here show a clear paradigm shift from the old process of PD, which viewed PD as being a private or individual activity to a public act where the learners are expected to talk about their problem of practice and think about their thinking. Research by Guskey (2003) refers to an NSDC (2001) report, which describes adults as learners, suggests quality adult learning occurs when adults are engaged in learning content through units of study that are motivating, are related to real-life situations, and provide choice and collaboration. In the same token, on behalf of the professional developers, quality teaching or presentation occurs when there is deep understanding of subject matter, deep alignment of curriculum and assessment, and when the instructor has deep understanding of pedagogical ways of meeting adult learners' needs.

Furthermore, effective professional development provides teachers with opportunities for active learning. For example, active learning can take a number of forms, including the opportunity to observe expert teachers in action (Garet et al., 2001).

Additionally, effective professional development is situated to teachers' needs (Dexter, Anderson, & Ronnkvist, 2002; Keller, Bonk, & Hew, 2005).

With the foundational understanding of what constitutes quality professional development as mentioned in the preceding paragraph, it can be argued that professional development focused on technology may look different from PD focused on how to help teachers build their capacity in the use of inquiry-based instruction. To explain, with the knowledge that professional development can influence a teacher's attitudes and beliefs toward technology (Shaughnessy, Chance, & Cobb, 2005; Teo & Wei, 2001), as well as provide teachers with the knowledge and skills to employ technology in classroom practice (Fishman & Pinkard, 2001), it is critical that purposeful PD be aimed at developing the skills of the participants and help facilitate the application of the newly acquired skills. There are vivid examples from literature that identify poorly organized training in the use of technology as a determining factor in if and how teachers use technology in their classroom. In the case of instructional technology, effective professional development should also focus on technology-related classroom management techniques, teacher knowledge building, and skills development. Sandholtz et al. (1997, cited in Hew & Brush, 2007), noted that, in every classroom, events typically take unexpected directions. The changes in a classroom environment caused by the addition of technology often lead to an even higher level of unpredictability. One way to help manage unpredictability is to establish clear rules and procedures for technology usage (Lim et al., 2003).

> Some of these rules included the following: (a) no unauthorized installation of programs and (b) no unauthorized change to the features of the computer control panel. Some of the procedures included: (a) indexing the computers with the index number of the student to facilitate student seat assignment and enable the teacher to track down the student who abused the computer, and (b) pairing students with stronger technology skills with those who needed more support using technology to reduce the need for students to frequently interrupt the teacher for help.

In the same vein, professional development that is inquiry-based focuses on improving the learning of all students by providing teachers with ways of understanding the complexities of teaching; understanding how to set successful student expectations; and creating learning environments that are safe, orderly, and supportive (Brophy, 1998; Cambourne, 1995; Jackson & Davis, 2000). Professional development activities must provide teachers as adult learners with learning experiences that allow participants to interact around common topics. These activities have been found to lead to deeper levels of understanding (Vygotsky, 1978). The common topic on which interaction takes place must be grounded in scholarly materials to further their conceptual knowledge base (Corcoran & Goertz, 1995).

Subtheme: Professional Learning Communities

"As anyone who has worked in the field knows, implementation of new practice is the biggest challenge of all" (Farrington, Hollin & McMurran, 2001, cited in Fixsen & Blasé, 2009). Inherently, when faced with new knowledge or experiences, we work to

assimilate them into existing knowledge scripts, or we adjust our script to accommodate the new knowledge (Piaget, 1972). Assimilation is a conserving process striving to "make the unfamiliar familiar, to reduce the new to the old" (Flavell, 1963, p. 50, cited in Spillane, 2004). A powerful mechanism for the bridging the policy implantation gap is Professional Learning Communities (PLCs). As previously discussed, there has been a major paradigm shift in how professional development is defined and facilitated within districts. The old paradigm was well grounded in additive learning, which constituted a private act of individual teachers attending district-mandated one-shot events addressing unrelated topics presented by external experts in a learning environment that perpetuated passive learning and was focused on skill development (Kaser, Mundry, Stiles, & Loucks-Horsley, 2002). Most often, the topic or topics addressed at these training sessions were theoretical quick fixes aimed addressing the crises of the moment (Smith, 2000). The new paradigm, however, grounded in transformative learning, categorizes quality PD that is a shared process focused on school-related issues of the "why and "how" of teaching and learning. Instead of being a one-shot deal, PD is recursive and sustained through the development and use of internal experts who strive to create a learning environment that fosters active learning as they apply research-based best practices (Kaser et al., 2002). Succinctly put, in additive learning, the goal is to acquire new skills and incorporate them into an existing repertoire. The goal of transformative learning is to change deeply held beliefs, knowledge, and habits of practice. Additive learning alone will not suffice when new ways of thinking about something are also needed (Thompson & Zeuli, 1999). In this study, such deeply held beliefs include those

dealing with inquiry-based instruction and technology integration. The new paradigm described here has a greater chance of taking root in a learning-oriented organization that has well developed Professional Learning Communities.

> The transformative approach to professional development is new and cutting edge. Transformation focuses on designing learning experiences that challenge participants' current thinking and often startle them into new beliefs. The old way can be described as evolutionary tinkering within the traditional paradigm. This contrasts sharply with revolutionary changes that transform the basic thinking and beliefs of participants in education, transformational learning occurs when teachers engage with student thinking and assess how well their current methods address the students' learning. Teachers are likely to discover that using the same old approaches to teach more challenging content just is not effective. They see the need to rethink what they do and how they interact with students. These experiences produce discomfort with current practice and the need to adapt to create better outcomes. Both additive and transformative professional development may be necessary. Additive learning is appropriate for developing new skills. However, learners must understand the assumptions and beliefs that guide the skill; or they may learn the skill well but lack the understanding of why they are using it. Transformative learning focuses more on making shifts in assumptions and beliefs and helping learners understand why a new approach might be necessary. The emphasis of education today is moving toward integrating both transformative and additive learning. (Kaser et al., 2002)

Corroborating Kaser et al. (2002), “Teachers who spend more time collectively studying teaching practices are more effective overall at developing higher-order thinking skills and meeting the needs of diverse learners” (Darling-Hammond & Ball, 1998). To best serve their students, educators need to learn how to provide rigorous, content-specific instruction to all students. Instructional personnel such as teachers, coaches, and leaders need to develop knowledge of content so that they can teach rigorous core mathematics, ELA, science, or social studies. In addition to content knowledge, they must also possess knowledge of pedagogy, seek out effective teaching methods that bolster pedagogical content knowledge, seek effective teaching of rigorous content area, have knowledge of student thinking, and have powerful habits of reflective practice (Shulman, 1987). Furthermore, in order to improve teacher practice, a teacher’s re-conceptualization of his or her teaching practice is facilitated by professional interactions with colleagues and others providing thoughtful feedback and assistance, the use of innovative curricular materials that provide scaffolding for teacher learning, and exposure to new ideas and experiences related to teaching and learning that provide opportunities to reflect on current teaching practices in light of new experiences (Smith, 2000).

CHAPTER III

METHODOLOGY

Overview of Methods and Rationale

This chapter covers the following topics. First, it provides an overview of the methods used and rationale for this study. Second, the research design is thoroughly explained by including a description of the setting and participants of this study. Third, it provides a brief description of the instruments that were used to collect data and how those data were coded after the interviews were transcribed. Fourth, data collection procedures are outlined, followed by the data analysis process. Fifth, since all research has shortcomings, delimitations are discussed. Finally, all the aforementioned processes are summarized to provide the reader a concise picture of how this study was conducted.

Situating the Study

In Chapter II, the discussion of educational mandates policy moved from the broad, federal level to the narrower, state level; now we discuss the more specific level, the district. However, before discussing how the district interprets state mandates regarding technology and inquiry, it is important to understand the context in which this study took place.

Carver Public Schools delivers instruction to students in a multitude of ways, including preschool services, elementary schools (K-5 and K-8), traditional 6th to 8th grade middle schools, a variety of themed schools (including Montessori, Spanish

immersion, International Baccalaureate, and others), and traditional high schools. The larger community in which Carver Public Schools is located, as reported in the 2000 census, is primarily Caucasian/White, with only about 20% of the population living at or below the poverty level. In contrast, of the approximately 18,000 students in the Carver Public Schools, 81% are eligible for free or reduced meals. The school district is comprised of 75% minority students, with 25% eligible for special education services or programs, and 20% identified as English Language Learners (ELL), speaking over 49 different languages and representing 70 different countries. A number of reasons for these striking discrepancies between the community and school population exist, among which are the large number of students who attend private or parochial schools, the growing number of charter schools, and the movement of middle-class populations to the outlying areas.

Carver Public Schools struggled to meet Adequate Yearly Progress (AYP) as required by the No Child Left Behind (NCLB) legislation. For example, 67% of incoming 9th grade students in Carver Public Schools were reading below grade level, as measured by the total national percentile on the MAP Reading Test. In addition, Michigan Educational Assessment Program (MEAP) English Language Arts scores for this same group of students showed only 46% of the students met or exceeded state standards, compared to 71% at the state level. The percentage of students in the district who met state standards on the 2011-2012 Michigan Merit Examination (MME) English Language Arts assessment for 11th grade students show 31% exceeding or meeting state standards, compared to 51% at the state level. The district's preliminary graduation rate,

one of the measures of Adequate Yearly Progress, for the four comprehensive high schools for 2011-2012 is well below the state's target of 80%. Carver Public Schools considers this graduation rate unacceptable and has an expectation that all students can meet or exceed state standards.

To this end, Carver Public Schools is committed to providing a guaranteed and viable curriculum to all students through the following mandated initiatives: common syllabi and assessments, integration and use of an electronic grade book, increased access to and use of computers for students and teachers, and constructivist-based instructional framework (5-E instructional model—Engage, Explore, Explain, Elaborate, Evaluate). The 5-E instructional model was adapted by Carver Public Schools from Roger Bybee's curriculum work through the Biological Sciences Curriculum Study **(**www.bscs.org). This constructivist-based model is being used throughout the district at the secondary level in order to foster content interaction by all. Additionally, Principles of Learning (POLs), based on the work of the Institute for Learning (IFL), were introduced in the district. The POLs at a glance are as follows:

1. *Organizing for Effort*. This learning principle seeks to provide learners with clear and high expectations, fair and credible evaluations, recognition of accomplishment, and a curriculum that is geared to standards.
2. *Clear Expectations*. The idea of this principle is that standards the students adhere to are available and discussed, models of student work are visible, students judge their own and others' work based on a clearly articulated

rubric, intermediate expectations are specified, and families and the community are informed of progress or lack thereof.

3. *Fair and Credible Evaluations.* This is defined by exams that are referenced to standards, a curriculum and assessments that are aligned, and grading against absolute standards. Scores are not based on a curve, and the reporting system makes clear how students are progressing toward expected standards and ensures that public accountability systems and instructional assessments align.
4. *Recognition of Accomplishment*. This encourages a learning organization to have frequent recognition of student work, recognition for real accomplishment, clearly demarcated progress points that are celebrated with family and community, as well as recognition by employers and colleges for those accomplishments.
5. *Academic Rigor in a Thinking Curriculum.* This principle emphasizes a commitment to a Knowledge Core, which is expressed by an articulated curriculum that avoids needless repetition and progressively deepens understanding of core concepts. A rigorous curriculum and instruction are organized around major concepts, the mastery of which are the focus of teaching and assessment. Furthermore, in a rigorous curriculum students are expected to raise questions, solve problems, and reason. These students encounter challenging assignments in every subject; they are expected to complete extended projects, provide explanations and justification for their

products, and reflect on learning strategies. Additionally, students apply active use of knowledge to synthesize several sources of information as they test their understanding by applying and discussing concepts while they are learning.

6. *Accountable Talk* ^{SM}. The main idea behind Accountable Talk is that learners are accountable to the learning community. Students actively participate in classroom talk as they listen attentively so that they can elaborate and build on each other's ideas and work to clarify or expand a proposition. Additionally, students are accountable for accurate and specific knowledge. They must provide appropriate evidence for claims and arguments and be committed to getting it right. Beyond the academic conversation, Accountable Talk holds students accountable to rigorous thinking as they synthesize several sources of information, formulate conjectures and hypotheses, and challenge the quality of evidence and reasoning.
7. *Socializing Intelligence.* This asks students to believe that they have the right and obligation to understand what is being taught and that they have the power to make things work. Students are empowered to know that they can attain a toolkit of problem-analysis skills (meta-cognitive strategies) and develop a good intuition about when to use them. Through working with peers, students know that problems can be analyzed and that they are capable of that analysis. They are encouraged to know how to ask questions, when to seek help, and how to gather enough information to solve problems.

8. *Self-Management of Learning.* This principle states that meta-cognitive strategies are identified, explicitly modeled, discussed, and practiced. Students who can self-manage play active roles in monitoring and managing the quality of their learning. To ensure that students learn self-management, a teacher scaffolds student performance during initial learning and gradually removes supports until students become agents of their own learning.
9. *Learning as Apprenticeship.* In this principle of learning, **s**tudents create authentic products and performances for interested critical audiences. Experts critique and guide students to create finished products that meet public standards of quality. Throughout the process, learning strategies are modeled (IFL, 2007).

Simultaneously, Disciplinary Literacy (DL) was introduced. The main idea of DL is that students are supported to work in the discipline. For example, in social studies, DL asks students to learn to inquire, investigate, problem solve, think, read, write, and talk as an historian about the big ideas and driving questions in history (IFL, 2009). To increase the likelihood of the new expectations being implemented, professional development was given greater scrutiny by the district policymakers. Carver, as a district, allocated significant human and financial resources toward increasing student achievement and improving instruction in the core content areas of English, math, science, and social studies.

Adequate Yearly Progress (AYP) is one of the measures of the viability of Carver's curriculum. Since the four comprehensive high schools did not meet AYP for

four successive years, curriculum development, targeted assessments, and technology integration became a major focus.

In the past, implementation of major initiatives aimed at bringing about substantive changes for the betterment of Carver, professionally or academically, had not brought the desired outcomes. Specific examples of these implementation breakdowns for Carver Public Schools include past curriculum programs that no longer exist, lack of total buy-in to the aforementioned 5E academic delivery training, and teacher technology cabinets and laptop carts standing unused. These failed implementations are no surprise, as items listed constitute major changes in the way schools deliver instruction. Hence, the process can run into many pitfalls and the number of those pitfalls only increases as a district gets larger in size. Carver's latest initiative, to implement common syllabi across the board, has taken off and they are looking to avoid pitfalls that could impede its implementation. The problem of sparsely implemented initiatives and unmet instructional improvement goals is not unique to CPS. This scenario is commonplace in other school districts across the state and the nation and is well documented in research (Fuhrman et al., 1991; Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Ross et al., 2004).

To better illustrate how policy interplays between federal, state, and school districts leading to district-mandated changes in inquiry-based instruction and technology integration and how social studies teachers in Carver's secondary schools experienced such mandates in their daily practice, it is important to understand the specifics of this study. The purpose of this phenomenological study was to understand the experiences related to new knowledge, new beliefs, and new practices of 7 secondary school social

studies teachers in one urban district (Carver Public Schools) in response to district-mandated changes in pedagogical requirements, both in technology and inquiry-based instruction. Due the nature of phenomenological studies, deeper exploration of participants' experiences reveals that personal experiences mediate response to mandates and have a profound impact on beliefs, knowledge, and practices. From this perspective, there is no attempt to claim an ability to generalize to a specific population, but instead, the findings are relevant from the perspective of the user of the findings (Bailey, 1982, p. 30).

At the onset, 25 teachers were invited to participate in this study. However, I was prepared to conduct the study if only 13 to 15 teachers agreed. To my surprise, less the half of the teachers that were contacted responded in the affirmative. Seven teachers agreed to participate in this study—four who teach middle school and three who teach high school. I used the phenomenological approach to examine the experiences of teachers; one lesson was observed for each the participants, one open-ended interview was conducted within 2 days of the observed lesson, and document analysis was conducted. The documents examined and analyzed were Professional Learning Community minutes, curriculum materials, common assessments, sample units, and other artifacts created during the interpretation and implementation of the mandated changes in inquiry-based instruction and technology-integrated lessons. I also engaged in two professional development experiences, as both a participant and a process observer. In short, I investigated the phenomenon of mandated changes (observations, one-to-one interviews, document analysis, and participation in one of several professional

development opportunities as a research participant). Also investigated was how teachers interpreted the mandated changes through the following lens: (a) beliefs regarding instructional technology and its use in the classroom, (b) using inquiry as a teaching approach, (c) professional development, (d) administrative support, (e) collaboration with colleagues, (f) resources for inquiry-based instruction and technology, (g) facilitating or impeding factors, and (h) change in instructional practices.

Research Design or Approach

Deciding on the right methods when conducting research is critical. Although no problem in education exists in isolation from other human behaviors (Merriam, 1998), the phenomenon that was explored in this study had unique characteristics which forced me to have a firm grasp of how each design may influence the flow and direction of the study. Patton (2005) stated, "There are no perfect research designs—there are always trade-offs" (p. 223). I had to negotiate the different types of research methods and see how each research method is suited to answer certain types of questions but may not be appropriate for other types (Creswell, 2003; Thomas, 2003).

To explain, I considered conducting surveys as a means of data collection for this study. According to Marshall and Rossman (2006), "Survey research is the appropriate mode of inquiry for making inferences about a large group of people based on data drawn from a relatively small number of individuals in that group" (p. 125). Also, a survey would have allowed me to focus in on this sensitive topic (mandated changes) (Marshall & Rossman, 2006). Furthermore, doing a survey would have offered me and the participants of this study the convenience, generalizability, and accuracy that are

associated with quantitative research (Creswell, 2009; Marshall & Rossman, 2006; Muijs, 2004).

I wanted a more personal approach to data collection. I wanted to understand the meaning of human actions and use any nonnumeric data that emerged in the form of words (Schwandt, 2001). A qualitative study was most appropriate. Since I concluded that what was happening in Carver Public Schools was unique; the concepts of blended learning, inquiry-based instruction, and innovation were not well understood; and the causes of the problem of mandated changes in inquiry and technology were new to the population at CPS and had not been addressed, this study fit the very attributes of a qualitative study (Patton, 2005).

Rudestam and Newton (2007) and Creswell (2003) listed eight distinctions between quantitative and qualitative research. Most notable are how they approach data, research design, and research site. This study focused on qualitative data (i.e., words or text collected from interviews, observations, and minutes from Professional Learning Community meetings). One reason for using qualitative data is that with qualitative data one can observe the chronological flow, see which events lead to which consequences, and come to meaningful explanations (Miles & Huberman, 1994). According to Miles and Huberman, "Words, especially organized into incidents or stories, have concrete, vivid, meaningful flavor that often proves far more convincing to a reader" (p. 1). For example, the participants in this study chronicle their experiences with mandated changes in inquiry and technology by talking about items such as the professional development they received, or relationships formed with colleagues in order to make sense of the

mandated expectations. I tend to follow the constructivist paradigm because I believe that we do not find or discover knowledge as much as we construct or make it (Schwandt, 2001). I took on the constructivist of myself as a researcher in that the researcher and participants work together to co-construct understandings, create meaning, and interpret the results. The participants and I co-constructed meaning for this study.

The interviews conducted for this study utilized specific and issue-oriented focused questions to facilitate the conversations and explore informants' experiences (Briggs, 1986; Hatch, 2002; Mishler, 1991; Spradley, 1979). This study was conducted in the natural setting. I used multiple methods to collect the data. Among the methods previously stated in this chapter, the interviews were the most humanistic in that they drew up the experience of many people. During the interview process, I remained flexible and "emergent," being mindful that the questions I asked may have changed as the research evolved, and that the data that emerged from questions as interviews were conducted may have been impacted as well. In Chapter IV, I interpret the data by describing the setting and analyzing the data to discover themes to draw conclusions; I also attempted to look holistically at the phenomena of mandated changes in inquiry and technology.

I had to establish clear criteria for choosing a design approach that would provide the best way of getting answers to the questions that I was asking. A phenomenological approach is defined as follows: "A phenomenological study describes the meaning of the lived experiences for several individuals about a concept or the phenomenon" (Creswell, Plano Clark, Gutmann, & Hanson, 2003, p. 132), focusing on "insight, discovery, and

interpretation rather than hypothesis testing" (Merriam, 1998, pp. 28-29). Additionally, staying true to the tenets of a phenomenological approach (i.e., the descriptive study of how individuals experience a phenomenon), I explored the meaning, structure, and essence of the lived experience of this phenomenon by several individuals. I searched for commonalities across individuals rather than focusing only on what was unique to a single individual. I was more interested in an in-depth understanding of the participants' experiences across a diverse sample rather than in generalizing their experiences to a larger population (Locke, Spirduso, & Silverman, 2000, 2014).

This research had the potential to be broad in nature. However, staying within the scope of the study, my goal as the researcher was to provide rich details of the participants' lived experiences to all interested parties, while acknowledging that I bring biases, values, and interests from my own experiences as I interpret and report the findings. I have acknowledged this bias and I designed the study in a way that limited those biases from influencing the findings. The design of this study was multi-faceted, as it tried to address varied interests in how inquiry and technology were viewed and experienced. Inductive and deductive reasoning was used throughout the process of data collection and analysis. I was intentional in how the questions were formulated. I applied the process of member checking to ensure the questions were not leading to the interviewees. In member checking, the researcher shares his finding with participants so they can judge the accuracy and credibility of the account.

Furthermore, I used one or more strategies of inquiry (Creswell et al., 2003; Marshall & Rossman, 2006). I was intentional in remembering that the setting and

participants of this study exist in a unique environment and that the key to quality data collection lies in building relationships. Because I was an employee of the school district in which this study is situated, there existed a level trust between the participants and me that an external researcher would not have had (Creswell, 1998, p. 289). The participants and the setting of this study are described next.

Research Sample and Participants

As mentioned earlier, criterion sampling was used in this study because I wanted all participants to represent people who have experienced the phenomenon that I was studying (Creswell, 2007). Equally important was identifying individuals who were likely to have relevant information about the mandated changes in inquiry-based instruction and lessons that integrate technology, so that they serve as rich sources of information (Patton, 2005, p. 143).

The teachers targeted for this study were selected using purposeful sampling, also referred to as a criterion sampling approach (Creswell, 2007). Regarding purposeful sampling, Creswell (2007) stated, "The inquirer selects individuals and sites for study because they can purposefully inform an understanding of the research problem and central phenomenon in the study" (p. 125). Topics of interest were identified and individuals were sought who would most likely provide relevant information and serve as rich sources of information (Patton, 2005, p. 143). Specifically, this group of secondary teachers in the Carver Public Schools (CPS) had undergone a similar experience of district-mandated pedagogical changes in both technology and inquiry-based instruction. The criteria used for sampling was based on (a) the teacher's school location, (b) content

areas taught during the 2010-2011 through 2012-2013 school years, (c) the number of years the teacher had been teaching, and (d) and whether a teacher received an effective or ineffective evaluation as defined by the Danielson Instructional Framework Rubric during the teacher's tenure up through the 2012-2013 school year. To further explain the qualifications, the researcher sought teachers who had at least 5 or more years of teaching experience, taught social studies, worked in grades 6 through 12 in CPS, and had participated in no less than 2 years of professional development (PD). According to district records, 2 years of PD equaled a minimum of 100 hours of professional development in instructional technology and inquiry-based instruction.

Technology integration varied in form and process depending on whether the teacher taught in grades 6-8 or grades 9-12. For the teachers who taught in grades 6-8, technology integration was broad in that teachers had greater freedom as long as they addressed technology standards (i.e., METS). In grades 9-12, however, technology integration was prescribed in the form of blended/hybrid classroom environments using predetermined curriculum and scripted lessons plans that were located on the Moodle, an open source learning management system (LMS). In regard to inquiry-based instruction, all secondary school teachers (grades 6-12) identified for this study were exposed to this phenomenon equally through various district policy instruments such as curriculum materials, common syllabus and assessments, instructional supervision, and professional development (Spillane, 2004, p. 47). The data sample did not include the building administrators.

Social Studies teachers were recruited in the following manner:

1. I met with the principal of each school and personally described the purpose and process for the study.
2. Following the meeting with the principal, I placed the "Requesting Participation Letters" in all social studies teachers' mailboxes (see Appendix A for the sample letter for these teachers).
3. Eligible and interested teachers had the opportunity to ask clarifying questions at meetings that took place between November and January.
4. Eligible and interested teachers reviewed the consent document before deciding whether to be observed and interviewed (see Appendix B for consent document).

Qualitative Data Collection Methods

This study involved collecting qualitative data from 7 teachers who have undergone similar experiences of district-mandated changes pedagogically in both technology and inquiry-based instruction. Data were collected through one-on-one interviews, agendas and minutes from Professional Learning Community meetings and classroom observations, and through the participant observer process in professional development sessions. The questions that were asked during the interviews were designed to extrapolate how teachers experience and reconcile any conflicts between their deeply held beliefs, values, assumptions, and practices, specifically when and if the conflict relates to changes in pedagogical requirements both in technology and inquiry-based instruction.

The interviews were not tightly structured, thus allowing the interviewees to develop topics and raise issues concerning their experiences with mandated changes in inquiry-based strategies and technology integration that they felt were important. Interviewees were guided in the following ways:

- After I greeted the interviewee and introduced myself, I provided a brief overview of the purpose of the research project, which was to understand teachers' experiences with mandated changes in teaching using inquiry-based strategies and technology and how that impacts teacher beliefs, practices, and knowledge.
- I asked the interviewees to state their name, total number of years in education, and the number of years teaching in CPS, and to indicate consent to be voice-recorded.
- I asked the interviewees to provide an overview of their experience with inquiry-based instruction and technology integration.
- I prompted the interviewees to talk about mandated changes in their practice, beliefs, and knowledge in regard to inquiry and technology integration.

Later in the interview, as issues emerged, I asked interviewees to address specific areas if they had not covered them in their unstructured conversations. These questions filled out any developing clusters of data and served as a means of verifying or dismissing the presence of phenomena that emerged earlier in the conversation. The questions were asked in broad, non-directed terms such as, "Describe opportunities for job-embedded professional development," and "Why are some teachers not using inquiry

and/or technology in their classrooms? What do you think could be done to change their opinion?"

My direct involvement as the researcher in the data collection and analysis is one of the key challenges of qualitative research. An important factor in the data-analysis portion of a qualitative study is interpreting findings and minimizing the impact of bias when the researcher is the primary means of data collection. I was acting as the "human instrument" of data collection. I used inductive data analysis, which resulted in a different type of knowledge that is a byproduct of quantitative inquiry (Hoepfl, 1997).

Consequently, I made every attempt to limit the impact of any bias that may exist. This was done by allowing participants to review and clarify transcripts from the interviews and to verify the accuracy of statements made during data collection.

After the audio transcription process was completed and a written record produced, and the participants were confident that the written transcripts accurately reflected the comments made during the interview, the process of data analysis began and was completed 3 months later. Written transcripts are currently stored in a locked filing cabinet in the office of the researcher, as they were during the process of data collection transcription, coding, and summation. Following the completion of the project, the aforementioned written transcripts will be stored on the campus of Western Michigan University for at least 3 years.

Research Procedure

Three types of data were collected for this case study from participants: one-on-one interviews (30 minutes), classroom observations (entire class period—approximately

60 minutes), and artifacts from Professional Learning Community (PLC) meetings. There are disadvantages to this type of data collection. Polkinghorne (1989) recommended that researchers interview from 5 to 25 individuals who have all experienced the phenomenon. Marshall and Rossman (2006) explained that interviews involve personal interaction and cooperation is essential. Interviewees may have been unwilling or uncomfortable sharing all that the interviewer hoped to explore. During observations, the subjects may have altered their normal behavior due to the presence of the observer. Despite these disadvantages associated with this type of data collection, participants were genuinely engaged in the research project and were eager to share their lived experiences.

Due to the participants' teaching schedules, interviews were scheduled at a time that was convenient for them. The interviews took place in an office within the school building, with each session being audio recorded to guarantee accuracy of records and to permit the researcher to focus on the teacher and his or her responses. The participants had the discretion to request that recording device be turned off at any time. One participant requested that the recording device be turned off during the interview because she tearfully recalled an intense conversation she had with her principal regarding instructional resource allocations. The researcher and the educator equally had the opportunity to review the written record at a later date to ensure accuracy and to permit any follow-up questions or comments by either the researcher or the participant. The observation and interviews remained anonymous with no identifiable information shared with any party, at any time. No audio or video recording device was used during classroom observations. Scripted notes were taken by the researcher. The final pieces of

data collected from participants were the minutes and agendas used as part of weekly Professional Learning Community (PLC) meetings. Since PLCs are pseudo focus groups (Locke et al., 2000, 2014; Mertens, 2010; Patton, 2005), I was intentional in making sure that in the course of the interviews the participants made a distinction between their personal experiences and those of their colleagues, which may have been shared in the PLC. The information collected was divided by grade level taught (i.e., grades 6-8 and grades 9-12) because of how differently these groups experienced technology integration. Minor points of distinction were highlighted in the final analysis. The findings are reported in terms of "5 of 7 secondary teachers reported that . . ." The content of PLC meetings helped in triangulating data from the classroom observations and interviews. The Classroom Observation Tool/Protocol (Appendix C) and Interview Protocol (Appendix D) were attached to the consent letter for teacher review.

The researcher estimated it would take 1 to 2 weeks to receive the informed consent from each of the participants. The data collection process for this study took place from December 2012 through October 2013. Because this study was conducted in his current work environment, the researcher was intentional in ensuring that there was no predetermined linking of teacher data, and no data were collected from any teacher who did not agreed to participate in the study.

Instrumentation/Data Collection Procedures

Interviews

In-depth phenomenological interviewing techniques were used to interview 7 secondary school teachers in Carver Public Schools. Pilot interviews took place with

three staff members who were not a part of the study to ensure the questions were appropriate. The pilot interview process helped eliminate confusing questions (Merriam, 1998). Interviews (semi-open ended), two classroom observations, and an examination of documents and artifacts (i.e., PLC minutes) were completed (see Interview Protocol in Appendix E).

Observations

The interviews followed a 1-hour classroom observation as means of collecting enactment data since the study took place in a natural setting, the teachers' classrooms (Creswell, 1998, p. 15). Field notes on the behavior and activities of the participants at the research site were taken in the natural setting. It was important to see if the information gleaned during the interviews matched the observations or vice versa. Reflections were added to the field notes as they were typed after the observation (see Observation Protocol in Appendix C).

Artifact Analysis

In a qualitative study, artifacts can be archives, literature, media records, instruments, art, clothes, etc. (Miller, 1999; Sandelowski, 1986, 2000). As they pertained to this study, I reviewed minutes and agendas from Professional Learning Community meetings, teacher resources, and student textbooks, both print and digital, to ascertain their connection to inquiry-based instruction and technology integration.

Data Analysis Plan

Data Analysis

Creswell's (2003) generic process of data analysis was used. The process is outlined as follows.

Step 1 – Organize and prepare the data for analysis. Transcribe the interview tapes and type field notes. Each interview consisted of 30 minutes of conversation. Due to the length of the discourse, a professional court stenographer was hired to transcribe the interviews. The notes taken at the time of the observation were recorded exactly. The short hand comments were fully explained in order to provide a full picture of what was seen during the classroom visit.

Step 2 – Read through all the data. Get a general sense of the information and reflect on the meaning. It was interesting to read through all the data that were collected during the observation and the interviews. I was astonished to find that, on average, 30 minutes of conversation resulted in 10 pages of single-spaced text. Even though there was a lot of text, the thoroughness of the responses provided a clearer insight of how teachers experienced mandated changes in inquiry-based instruction and technology in their daily practice.

Step 3 – Begin detailed coding process. Organize the material into manageable portions before bringing meaning to them. Once I had read the transcribed interviews and the observational notes several times, certain themes began to emerge. These themes were coded according to the interview questions with which they were closely correlated. The interview questions had previously been correlated to research questions. The themes

that did not match a particular question were added and addressed as unsolicited insight. An example of one such theme was the issue of resource inequity across Carver Public Schools. In CPS, schools that were identified on the state's failing school list received more technology and resources for inquiry instruction than those that met adequate yearly progress (AYP).

Step 4 – Use the coding process to describe the setting and people, as well as the categories and themes. The setting in which the study took place is described in vivid details while maintaining anonymity. The school names and teacher name are pseudonyms. The themes that emerged were categories to reflect the major themes identified in literature.

Step 5 – Determine how the data will be presented in the qualitative narrative. Since the purpose of this study was to understand teacher experiences with mandated changes in inquiry and technology, the data are represented in narrative format. Participant comments are represented as they were transcribed from the interviews. Minor grammatical changes were made for clarity after member checks were done.

Step 6 – Make an interpretation of the findings or a meaning of the data. The interview data were interpreted to according the research questions to which they were aligned. The information gathered from classroom observations and artifacts from Professional Learning Communities (PLCs) were used to triangulate the findings.

Validating the Accuracy of the Findings

Since this study is a phenomenology, I anticipated that it may be difficult to find studies similar in scope against which to compare the findings. I was concerned with

whether I interpreted the data correctly (Arminio & Hultgren, 2002; Creswell et al., 2003). Applying qualitative analyses, I depended on verification procedures to assure credibility and "goodness" of the data (Arminio & Hultgren, 2002, p. 450). Furthermore, in order to check the accuracy of the findings, I use used member checking by taking the final report back to the participants in order to determine if the findings were accurate. Creswell (2007) stated, "Validation in a qualitative research is an attempt to assess the 'accuracy' of the findings as best described by the researcher and the participants" (pp. 206-207). I also used the information gathered from classroom observations, artifacts from PLCs, and the information gathered from the professional development events to triangulate the data. I was also cognizant of my personal bias as Carver Public Schools' curriculum specialist and a district-level employee based in the central office; thus, I used self-reflection to create an open and honest narrative that would resonate well with the audience (Creswell et al., 2003).

Delimitations

Ethical Concerns

Due to the nature of the research questions, confidentiality was maintained throughout the research. Participants completed the Human Subjects Institutional Review Board Consent of a Responsible Adult, which outlines ethical concerns that could have possibly risen in the course of this study (see Appendix B).

A protocol for informed consent was developed, as the participants should be informed of the nature of the investigation and the reasonable time and effort required of them as participants in the study (Locke et al., 2000, 2014). Throughout all phases of the

research process, I was sensitive to ethical considerations (Creswell, 2007). Since the teachers who agreed to take part in this study worked closely together in Professional Learning Communities, in the course of this study I was purposeful in protecting the confidentiality of individual participants. I was sensitive to vulnerable populations and imbalanced power relations, and of placing participants at risk (Hatch, 2002).

Hatch (2002) suggested that researchers need to address the following ethical issues when conducting a study:

1. Provide some kind of remuneration to the participants for their time and effort. (In this study, the participants received remuneration in the form of a $15 gift card to the teacher store, as well as feedback and a one-to-one coaching session to reflect on the lesson that was observed.)
2. Leave the scene of the research study slowly after conveying information.
3. Always be sensitive to potential of the research to disturb the site and potentially (and often unintentionally) exploit vulnerable populations.
4. Be sensitive to any power imbalances the researcher's presence may establish at the site that could further marginalize the people under study.

It was important that the participants were treated with respect and that the study itself was conducted with the highest level of integrity and honesty. In the course of conducting this study, I remained completely transparent in recognizing the potential risks to the teachers participating in this study. Two of these were potential breeches of confidentiality and my perceived position of authority, due to my current work in the district central office. To explain, prior to conducting this research, in my capacity as

curriculum coordinator, I frequently worked with teacher participants in organizing curriculum resources such as common syllabi, common assessments, and other instructional materials. Also, when called upon, I coordinated professional development opportunities for social studies teachers.

To mitigate the risks mentioned above, prior to transcription, participants were assigned pseudonyms. Also, the audio recordings were destroyed once the transcription process had been completed. A written record was produced, and the participants were confident that the written transcript accurately reflected their comments during the interview. In light of this reality, the nature and level of occupational risks were assessed. Information collected in this study was not and will not be connected to any teacher evaluation process or occupational merit. Teachers dedicated approximately 2 hours and 30 minutes to this study. There were no other known risks or discomforts associated with participating in this study. As an employee of the district which was studied, I, as the researcher, had to "bracket" my own experiences in order to fully understand the experiences of the participants (Creswell, 1998). "Bracketing describes the act of suspending one's various beliefs in the reality of the natural world in order to study the essential structures of the world" (Phenomenology Online, 2012).

Limitations

In this qualitative research, the findings will be important to policymakers and teacher leaders in Carver Public Schools. The findings of this study may have great implications in district policy regarding instruction, specifically in terms of defining high quality instruction, effective technology integration, and teacher effectiveness. Although

the participant sample size was small, it was appropriate for a qualitative study. To explain, 5 out 7 the teachers who participated in this study were Social Studies Disciplinary Literacy Coaches. The teachers were selected as coaches because they were early implementers of the mandated changes in technology and inquiry-based instruction. Having the majority of participants as DL coaches may present a bias in that their experiences portray the CPS actions from a favorable position. It could be assumed that as chosen leaders, they may have felt compelled to speak favorably about district leadership. On the other hand, having 5 of 7 participants as DL coaches provides a broader insight into how other teachers in CPS experienced the mandated changes because each DL coach worked with a minimum of 6 teachers weekly. Overall, the 5 DL coaches worked with 32 regular and special education social studies teachers. Thorough analysis of their responses to the interview questions brought to life the experiences of their colleagues. The themes may not be generalizable to other districts or schools, but it is my hope that the findings of this study will add to the existing body of literature regarding the topics of mandated changes in inquiry-based instruction and technology-integrated lessons. Furthermore, it is my hope that the themes outlined in this study will add to the body of literature in this area and encourage further studies that will lead to an ongoing dialogue about mandated changes in inquiry and technology. It is also hoped that the findings of this study bridge the gaps in literature and can be compared to results from other studies (Creswell et al., 2003). One of the main reasons for conducting a qualitative study is to listen to participants and build an understanding based on their ideas. Therefore, in phenomenological studies like this one, the literature review served to

create context and affirmed the themes that surfaced to set the stage for the study (Creswell et al., 2003).

Summary

Qualitative research is emergent and it changes as the process of the study progresses (Creswell et al., 2003; Patton, 2005, p. 255). This chapter outlined the process through which this study was conducted using the phenomenological process of data collection via interviews, observations, and artifact analysis. The meanings and themes have been distilled into the essence of the lived experiences in narrative form. The holistic approach taken in conducting this study speaks to the reality that federal and state governments, districts, classrooms, and individuals who represent the constituencies involved make up a complex system that is greater than the sum of its parts (Patton, 2005, p. 59). It is my hope that as the findings of this study are reviewed and reflected upon, the reader will be mindful of the fact that in qualitative research there is no perfect formula for transforming data into findings (Patton, 2005, p. 435). However, the design intentionally remained open and flexible to permit unrestricted exploration of the phenomenon of CPS's mandated changes in inquiry-based instruction and technology-integrated lessons.

CHAPTER IV

RESULTS: FINDINGS IN DISTRICT-MANDATED CHANGES IN INQUIRY AND TECHNOLOGY

Overview of Purpose and Questions

This study may help provide some insight into the question, (1) How do individual teachers experience mandated changes? as well as heighten the discussion around the proverbial question, (2) Does mandating change at the classroom level in inquiry and technology really work in changing teacher beliefs, knowledge, and practice? This study, although not a policy study, will help provide some insights into the question, (3) Is there policy coherence within a district as it translates federal and state policy into changes in teacher beliefs, knowledge, and practice?

The specific research questions this study investigated were as follows:

a. In terms of knowledge, beliefs, and practices, how do teachers experience district-mandated changes in both technology and inquiry-based instruction in their daily practice?
b. How do individual teachers experience mandated changes?

Description of Data

Carver Public Schools (CPS) is located in the upper Midwest region of the United States. As one of the largest and most diverse urban districts in this part of the country, it is attractive to individuals wishing to conduct educational research in an urban district. Because of the ongoing requests for permission to conduct research within its system,

CPS has established a stringent and extensive checks-and-balances process to be followed by those who seek permission to conduct research. Even though at the time of this study I worked in the district's central office as a member of the academic team, I was not exempt from the permission-obtaining process. First, I contacted the district's Office of Evaluation and Assessment, expressing my desire to conduct research within its schools. Once I had completed all the necessary paper work and had held an in-depth one-to-one conversation with the deputy superintendent of instruction, I was granted permission to contact principals and teachers. Initially, I contacted eight middle school principals and four high school principals via e-mail and a letter of intent that was sent through the district's interoffice mail system. The letter explained my project and asked for their assistance in delivering the teacher invitation letters. All four high school principals agreed to participate in the study, as did four of the eight middle school principals.

For context, it is important to note that in CPS there are various configurations such as "true middle school" or "pure K-8" buildings. In CPS, a true middle school building houses grades 6, 7, and 8. The students use the high school model in that students change classrooms between all core content teachers. In a K-8 building, there are students from kindergarten to 8th grade. The teachers, who teach in K-8 settings, do so in self-contained classrooms. They are expected to teach all core subjects—i.e., English Language Arts (ELA), Math (MA), Science (SCI), and Social Studies (SS). There are exceptions in cases where the building leaders decided to assign a certain teacher a specific content area on which to focus. For example, if the building has more than one

6th grade teacher, one teacher may be assigned to teach social studies and English Language Arts classes and his or her counterpart may be assigned to teach math and science classes.

In this chapter, I provide the findings of this study according to the themes around which the interview questions were structured. As I conducted the interviews and talked with teachers, I intentionally listened for indicators of the teachers' (a) beliefs regarding instructional technology and its use in the classroom, (b) using inquiry as a teaching approach, (c) professional development received from the district or from other sources, (d) administrative support in meeting the mandated expectations, (e) collaboration with colleagues, (f) resources for inquiry-based instruction and technology, (g) facilitating or impeding factors, and (h) change in instructional practices. As discussed in Chapter III, middle school and high school teachers experienced the mandate to change how they taught social studies using inquiry-based instruction and integration of technology differently into their daily practice. These differences are highlighted as brought forth by teachers in the interviews.

Participant Profiles

Five of the 7 teachers who participated in this study played two roles in their respective schools. For Teachers 1 through 5—Mrs. Jana Laveran, Mrs. Harriet Müller, Mrs. Jessica Woods, Mrs. Lena Manson, and Mrs. Coletta Johnson, their first role was that of a Disciplinary Literacy (DL) coach or sometimes referred to as Instructional Coach (IC). The second role was that of a classroom teacher assigned to teach particular social studies content to a specific grade. As defined in Chapter II, Disciplinary Literacy

is a research-based approach to teaching and learning in which teachers and students read, write, talk, and investigate using the habits of thinking in the discipline being studied.

Furthermore, DL coaches or ICs in the Carver Public Schools were expected to assist teachers in applying the Disciplinary Literacy strategies learned during professional development and Professional Learning Community team meetings to their classroom instruction, facilitate learning walks, hold instructional conversations, conduct collegial observations, and facilitate Professional Learning Community team meetings. Additionally, coaches were expected to assist fellow teachers with the designing of DL lessons and developing rubrics and assessments related to social studies content, demonstrate or model lessons using DL strategies, and provide written and verbal feedback to their colleagues through the Content-Focused Coaching model. They were looked upon to model instructional best practices in inquiry and technology for the teachers in their building and sometimes for teachers across the district through Professional Learning Communities and districtwide professional development events. It is also important to mention that DL coaches were assigned to schools that were considered "failing" schools. CPS had several schools that were designated as School Improvement Grant (SIG) schools. SIG schools are schools whose student achievement performance is in the lower 5% of schools in the state. Because of the schools' achievement history, SIG schools are given additional support, which includes an infusion of technology, additional adults, and allocated resources for professional development.

The primary role of the two remaining teacher participants, Mrs. Mary Boykin and Mrs. Nina Ross, was to teach their assigned content to their assigned grade level. Mrs. Ross taught in a SIG middle school, while Mrs. Ross taught in a non-SIG middle school.

Teacher 1: Mrs. Jana Laveran

Mrs. Jana Laveran had been teaching since she graduated with a Bachelor of Science in Education from a local liberal arts university 17 years ago. Her degree allowed her to teach all history/social studies courses in K-8 settings. Mrs. Laveran had worked in the Carver Public School district her entire teaching career. She had taught in three different schools in the district and with various configurations, such as a "true middle school" and a "pure K-8." For the past 4 years, Mrs. Laveran was assigned to teach 8th grade United States history in a true middle school.

Mrs. Laveran had a master's degree in education. However, in her training and preparation, she had little experience with inquiry and even less training in educational technology.

Teacher 2: Mrs. Harriet Müller

Mrs. Harriet Müller received her degree from a liberal arts institution majoring in social studies and political science. At time of this study, Mrs. Muller had been teaching in CPS for 9 years. She talked about how different her college preparation and her practical experience in the classroom were. She stated, "What I got from college and once you actually start your career, in the real realm of education . . . is a lot different. Definitely the management portion is much different, and management obviously helps

facilitate learning." She went on to explain that her college preparation in social studies/ history did not emphasize technology, nor did it place great importance on inquiry-based instruction. At time of this study, Mrs. Müller was taking graduate-level courses that focused on inquiry and writing in the Common Core State Standards. According to the State Governors Association, the Common Core State Standards in English Language, Science, Social Studies/History, and Technical Subjects provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them.

Teacher 3: Mrs. Jessica Woods

Mrs. Jessica Woods received her secondary certification after having worked in non-education fields for 15 years. Her teacher preparation was non-traditional in that her work and life experience was considered a part of her certification. In her methods classes, there was little emphasis on inquiry-based instruction or technology-integrated lessons. Specifically, Mrs. Woods had been a member of the National History Educators Association, the Michigan Council for Social Studies (MCSS), and the Michigan Association of Computer Users in Education (MACUL). At the time of this study, she taught 11th and 12th graders economics and government while serving as an Instructional Coach (IC) or Disciplinary Literacy (DL) coach.

Recounting her preparation in technology, it was evident that Mrs. Woods was motivated to learn about technology.

> I personally sought out conferences that supported the use of technology . . . early on, I made sure I was aware of district initiatives and worked with the district

> educational technology trainer to be better at understanding the Moodle. . . . And so it's, I think it was a lot of on-my-own learning plus collaborating within our small social studies PLC . . . we had numerous PDs on the district level that integrated the technology like E2020, Novanet, or Moodle over the years.

Within Carver Public Schools, Mrs. Woods had been a member of the social studies curriculum development team. As a member of the curriculum team, Mrs. Woods worked to unpack and align the State of Michigan's High School Course Content Expectations (HSCEs) and now the Common Core State Standards (CCSS) for CPS's common syllabus. Even though there are no CCSS for social studies, the literacy standards apply to English Language Arts, Science, Social Studies, and Technical Subjects. For example, she recalled her curriculum alignment task as follows:

> I focused in on the curriculum that was put on Moodle, in that rotation model of blended learning, and made sure that it was aligned to the state's standards and, more recently, I have been working on the Common Core Standards, and supporting the district's initiatives with the blended learning system.

Most of her teaching career in Carver Public Schools had been spent teaching grades 9-12. As pertains to this study, it is important to note that Mrs. Woods experienced district-mandated changes in inquiry and technology both as middle school teacher and as a high school teacher. This distinction is important in that Mrs. Woods' lived experience reflects the differing expectations at the middle and high school. As mentioned in Chapter II, middle school teachers were expected to integrated the Michigan Educational Technology Standards (METS) in general, while the high school teachers were expected

to teach in a blended learning model that alternated students between two teachers, as the students experienced social studies content in a face-to-face format in one classroom and built on that experience in the next classroom through online content via the learning management called Moodle in a two-day rotation. Recounting her move between middle and high school, Mrs. Woods reflected:

> I came back to high school the following year, after one year of the forced technology integration with the rotations in the classroom, 3-day rotations. That year, when I came back, rotations phased out over the course of the year because of technology issues, teacher preparation, teacher's knowledge base of the technology integration, the formatting, um, and various other problems that were out of my control.

Teacher 4: Mrs. Lena Manson

Mrs. Lena Manson, at the time of this study, had been an educator for approximately 9 years. All her time was spent working in CPS. During her tenure, Mrs. Manson taught social studies in grades 9-12. She described herself as being an integral member of the social studies curriculum development team. Like her colleagues in the middle school settings, Mrs. Manson was a master teacher who served as an instructional coach. She was charged with supporting teachers in one of four high schools to implement Disciplinary Literacy and integrate technology into their instruction. She first provided support in the blended learning model, where students rotated between two teachers, as well as in traditional classrooms in which students had the same teacher all day long. She stated:

> I have been a part of Social Studies and Integrating Technology the last few years, the last four of them as an instructional coach, which entails doing a lot of research, traditional learning, support, and bringing those components into the classroom.

In reflecting on her preparation, Mrs. Manson recounted that she received limited preparation in teaching with inquiry and technology.

> In my undergrad . . . that seemed more of the basics. It was getting the foundation set, but the depth of which a lot of these components address I think has been, was just the foundation; I had to do a lot more outside, to build a true understanding and knowing how to really apply it.

In her master's work, focusing on instructional best practices in secondary schools, Mrs. Manson gained a deeper understanding and insight into how she could best support her colleagues in integrating technology and inquiry in their teaching.

Teacher 5: Mrs. Coletta Johnson

Mrs. Coletta Johnson attained a master's degree in education and had been teaching for about 12 years in the Carver Public Schools. In all her tenure she had taught social studies and English in all of CPS's four comprehensive high schools. When asked about her mobility among buildings, she attributed her moving among schools to the district policy of involuntary transfer process and bumping. To elaborate, the district's past practice and current practice at the time of this study was that teachers could be involuntary transferred from building to building based on tenure and principal discretion, and through the lay-off and recall process. Sensing my questioning pause

during the interview, Mrs. Johnson felt this was significant to mention when talking about the mandated changes in inquiry and technology, because the mobility offered her a broader perspective on the district and she could speak to how she and other teachers across the district experienced the mandated changes in inquiry and technology.

In reflecting on her undergraduate and graduate work, Mrs. Johnson stated:

> So one of my goals in teaching, when you write your philosophy of teaching, was that I am a facilitator of learning, and the kids are really the ones who are investigating and using, you know, technology if need be, to kind of find solutions to problems or what have you. So when I went into teaching I really thought I would be using a lot of that technology, only to find out that there wasn't technology, but I still used inquiry in the classroom. And that's, I've always come at education not only from project-based, but more from a problem-based method of teaching, and doing that for about 12 years.

Regarding technology, Mrs. Johnson had been a member of the blended learning course and assessment development team. She was well versed in using Web 2.0 tools such as the Moodle, a learning management system on which CPS hosted all its digital content. In addition to training that she had received through district-mandated technology professional development, the hands-on experience that she had received in graduate-level courses served her well.

> In one of my master's classes, before I started teaching, they had two technology courses that you had to go through. So I actually built a couple of web quests and websites (back in the days when you actually had to build them).

Teacher 6: Mrs. Mary Boykin

At the time of this study, Mrs. Mary Boykin had been teaching for over 23 years. All her teaching career had been in CPS. She had taught social studies in various grade levels ranging from grade 3 through grade 8. “I am proud to say that I have taught always in Carver Public Schools.” Mrs. Boykin attributed her understanding and use of inquiry-based instruction in her daily practice to her methods classes during her teacher preparation process. She stated, “Our professors concentrated on project-based methods, active engagement, using a variety of maps and other documents. The emphasis was on developing a lesson, rather than relying on a printed textbook, whatever the publisher tells you to do.”

Due to her experience in teaching at the elementary level, she found inquiry-based instruction easier to implement, because at that level, she was forced to make her lessons more hands-on. At the time of this study, Mrs. Boykin was teaching 7th grade students. Drawing from her elementary experience, “I used a lot of children’s books as engagement, to get the kids started, to have that jumping off point,” stated Mrs. Boykin. Although she recognized that district-provided resources for instruction were inquiry-based, Mrs. Boykin spent much time augmenting these resources to make sure her teaching was not tied to the “book.” As pertains to technology, Mrs. Boykin believed it was important for students to experience learning through technology. Due to limited access in her building, much of the technology experienced by students involved word processing as they typed reports and created PowerPoint presentations.

Teacher 7: Mrs. Nina Ross

Mrs. Nina Ross came to teach social studies through a non-traditional path. She spent the first 10 years of her educational career serving as an instructional/library media specialist. During her teacher preparation process, Mrs. Ross attained dual certification in social studies and library media. At time of this study, she felt that her preparation gave her a solid foundation from which to teach. However, she pointed out, "History/Social Studies is so broad that it's kind of hard to be prepared in all . . . all of Geography and so on." Elaborating further on the nuances of teaching, she stated:

> I would say that classroom management, the nitty-gritty of teaching, how the day goes and the classroom management—that really comes with experience. I don't think it's easy for colleges to teach that. They can give strategies, they can refer you to experts, but until you've experienced it yourself, it's kind of an abstract out there. So, I think a lot of the heart of teaching comes from experience and also from observing experts; those that are masters of the craft.

Mrs. Ross received much of her training in using inquiry-based instruction through district-mandated professional development activities that were facilitated by the Institute for Learning (IFL). The focus of the training was to help teachers plan and enact lessons through inquiry-based instruction lens called Disciplinary Literacy. Disciplinary Literacy asks students to think, talk, write, and read like historians or social scientists.

As pertains to technology, she highlighted an interest in technology: "I would say technology is a passion of mine." Mrs. Ross received a Master of Arts degree in instructional technology and library science. In addition to the formal training that she

received, Mrs. Ross sought additional technology training by attending conferences and took various technology classes throughout the years.

Analysis of Themes

In this portion of my research on how teachers experience district-mandated changes in inquiry and technology, I describe the meaning of the experienced phenomenon for the 7 participants. Although there are some references to the literature in this data description, an in-depth connection to the literature occurs in Chapter V, where the themes/findings are discussed. In Chapter V, I organize the literature review in such a way as to provide details about how the previous studies influence the findings of this study. In addition to the comparing literature and research, I provide the "essences" of the study to provide clarity for the readers.

Beliefs Regarding Instructional Technology and Its Use in the Classroom

In most teacher preparation programs, future teachers are often asked to write their personal philosophy about education. Specifically, they are directed to write about teaching and learning. What the teacher believes about teaching, learning, and the students they teach shows up in how they approach their work. To surface their deeply held beliefs, teachers in this study were asked to reflect on whether the choices they made regarding inquiry-based instruction and technology had an impact on student outcomes. Mrs. Johnson, one of the participating teachers, mentioned how she believed that her role as a teacher was to be the "facilitator of learning." For the purpose of this study, I begin by contending that deeply rooted personal beliefs show up in how teachers respond to mandated changes to how they teach using technology.

Teacher Belief About Technology and Its Use in the Classroom

All teachers who participated in this study believed that technology was an essential tool for teaching and learning. To explain, Mrs. Laveran recounted her experience with technology: "Since I have been teaching 8th grade, my goal was always to bring in—we didn't have iPads, but—laptop computers twice a week; but I also want to be sure that the learning is authentic, it's not just a goof-around." She continued by talking about how she uses the Socratic app to help students better understand content and self-assess.

In addition to identifying her own weakness—"technology is not my go-to thing"—in the use of technology as an instructional tool, Mrs. Laveran also acknowledged that teaching with technology can be overwhelming. Looking at her experience with fellow teachers in her role as a teacher coach, she reflected:

> Like I said, teachers are overwhelmed, but at the same time, that is their/our job. They took on this job for a reason, and though everybody's reason is probably different, it really all revolves around the fact that they wanted to make a difference in a kid's life. So even though we have all those stressors, we have to do our very best to not focus on those, even though they are on our periphery, but focus on what is best for our kids.

Similar sentiments were reflected in Mrs. Ross's interview. In reflecting on the use of technology, she saw it as a tool for enhancing the lesson for the students from low socioeconomic status. It is important to note that Mrs. Ross taught at a low-performing school, a School Improvement Grant (SIG) school whose student population was

predominantly African American and Hispanic. Making connections to the lesson that I observed for the purpose of this study, Mrs. Ross had her students exploring the European Union (EU) countries using iPads. She stated,

> Especially with our population, anything you can do to make it interesting and relevant to them, up-to-date, is going to motivate them more. If we [teachers], if I give them a fact sheet on their country, which has the exact same information that they can get off the online links, I can tell you that they wouldn't be half as engaged in this project as they probably are right now, with the ability to . . . but then we are also teaching them skills, on how to research.

In responding to the question of whose responsibility it is to teach students about technology, Mrs. Müller's response was representative of all teachers in this study. All teachers believed that they had shared responsibility to teach about technology. Mrs. Müller said,

> I think it's the responsibility of everyone, you know, I mean we can't get away from the fact that we are a much more digital society than we've ever been before, and a great deal of our children's communication is via technology. I do think it's important that they [students] see positive exposure to technology, not just through texting or Facebook, or other social media sites, but see representations of academic technology, in homes as well as at school.

In talking about how important it was for students to experience technology at school and home, she was quick to point out that many students do not have access to technology at home.

> We have a lot of students who don't have access to Internet or other forms of technology in their homes, so where else are they going to receive it except from teachers? And it is our job to help them be prepared for the way society is going, and that is a definite trend towards technology.

The concern of student access to technology developed into a major theme in this study. All teachers interviewed for this study mentioned it as an obstacle to their integrating technology into their instruction. The issue of access will be addressed in greater detail later in this chapter in a section dealing with impeding and facilitating factors.

Drawing from her experience as a DL coach, Mrs. Müller spoke of the attitudes that her colleagues had toward technology and its role in instruction. It is important to note that since the majority of the participants facilitated interactions among teachers in their role as DL coaches, some of the responses to the interview questions include perceptions of experiences from teachers with whom they worked.

> The group that I work with this year, I have four teachers; I have one who has been teaching 30, probably close to 30 years, if not a little over 30 years. It's been a little more difficult to get the buy-in with that older teacher than my other teachers. One is just in her second year of teaching, and my other two teachers are brand-new—this is their first teaching experience. So they're much more willing to look at things from a different perspective and try. My veteran teacher, um, has come a little ways this year and is becoming more open-minded, and trying to do things in a different way, and using technology more with the Smart Boards that

> we received. Like she is really, you know, reaching out to learn how to better-utilize that piece of technology, how the kids can interact with it, um, and things of that nature. It's just taken a little longer.

Mrs. Ross, a middle school teacher, shared how she had to teach her students technical terms in preparation for teaching them with technology. She stated,

> You know, we went over what a URL is, when we first introduced this research project. We went over the word *database*, what were credible sources, so we were able to embed some of those Common Core skills into our pre-lesson for this project, so that they're starting to learn effective researching skills.

High School Teacher Belief About Technology and Its Use in the Classroom

The three high school teachers who participated in this study played several roles in Carver Public Schools as well. It should be noted that the high school teachers experienced the mandated changes in technology through blended learning with rotation. To explain, all social studies teachers who taught grades 9-12 in CPS were expected to facilitate instruction via Moodle, a web-based learning management system. The teachers were expected to teach a portion of their class using digital content in face-to-face and online environments. In the course of the interviews, based on most high school teacher responses to the questions regarding the use of technology in teaching, it was easy to infer their personal beliefs about technology. All high school teachers spoke about technology through their coaching lens and made connections to the work that they were doing in helping their colleagues meet mandate expectations.

Mrs. Manson believed that using technology in instruction is important:

> I think they [teachers] see the importance of it. I think they don't always know how to do it or feel that the time allotted in their classroom is necessarily enough to really support all the technology standards that the kids need; I think they see a need for computers, technology classes, and how they can be applied to cross-curricular work.

In thinking about teachers' belief about the role of technology in instruction, Mrs. Johnson stated,

> I think it [teacher belief] makes a huge impact. To kind give an example of that, I think if a teacher comes in and they do not really want to use technology, and they show kind of that negativity towards it, the kids take it as they're not going to learn anything from it, either. It kind of goes with how the teacher feels about it and how much passion they're putting in with it. I think technology is the thing that really keeps the kids learning.

Furthermore, she highlighted the importance of teacher choice:

> The choices as far as how things are aligning, I know that the teacher is really creating learning "games" that really align to what he feels is important for the kids to learn. The kids are picking up on that and they are learning from it. When they go to do a different "game," they'll even reference it—"Oh, this is similar in this way," and they'll keep that learning going and building on to it.

"Gaming" was used as a means of inquiry-based instruction and is connected to role play and simulations that are used to teach difficult concepts.

Mrs. Johnson believed that technology was a way to increase student engagement and excitement about the topic being studied. She stated, "Usually with technology and 'gaming' . . . they seemed to be participating more. In the classes where the teachers are just kind of handing a worksheet or giving them information, they kind of have their heads down and they're not really participating." Mr. Johnson made a connection of how she was using technology and inquiry in the lesson that I observed for this study. She was teaching United States history and geography and students were studying the Great Depression. She talked about how the lesson utilized technology to help students understand the fiscal environment at that time.

At the time of this study, Mrs. Woods had taught in grades 6-12 in the past and was now serving as DL coach in a high school that was a SIG school. As a SIG school, teachers that taught in her base school were required to perform additional tasks in order to increase student achievement. There was an increased expectation for the use of technology in instruction. Consequently, Mrs. Woods' belief about technology as a tool for instruction was evidenced in her response to the question of whose role it was to teach students about technology. She strongly believed that it was the teachers' responsibility not only to learn about technology but also to apply that learning by using it within their daily practice.

She went on to say that teachers' belief about technology impacts their actions in the classroom.

> Well, it goes to that mindset: if you're [teachers] willing to try different things and new approaches, and broaden your experience and teaching toolbox, then by

> all means, you'll have the ones that are ready and eager to integrate the technology. But if you [teachers] are from a mindset where I want to lecture, and I want to stand in front of the class . . . it's going to be a hard change for you.

As evidenced by the responses above, teachers who were interviewed for this study shared a similar stance, that what the teacher believes about technology in the classroom determines if he or she is going to use it. Even though middle and high school teachers experienced mandated change in technology differently, all the teacher participants underscored the notion that beliefs were a determining factor in how they experienced the mandate in technology implementation.

Professional Development: District-Provided or Self-Sought

Studies have shown the importance of professional development (PD) in ensuring policy implementation (Fullan, 2007; Spillane, 2004). As pertains to this study, to better understand teacher experiences in meeting the expectations of mandated changes in teaching using technology, the participants were asked to reflect on the support they received to that end. The main question was phrased broadly to facilitate conversation during the interview. Teachers were asked to describe opportunities for job-embedded professional development that was available to them.

The findings of this study reveal that teachers in middle and high school experienced professional development differently in terms of technology. To highlight the differences, I first discuss the professional development that middle school teachers received in technology. After discussing middle school teacher experiences, the conversation highlights the experiences of high school teachers. Both middle and high

school teachers spoke of the professional development in terms of school-provided and self-sought. When applicable, I also point out under which categories that PD fell.

Middle School Teacher Experience with Technology PD

The middle school teachers who participated in this study reported knowledge or awareness of district-provided instructional technology support. Even though they were aware of the PD opportunities offered though Carver Public Schools, there were differing opinions regarding the effectiveness of that support. For example, Mrs. Laveran acknowledged that she was able to get support from CPS' district technology trainer. She was very encouraged by the timely response from the technology trainer every time she had contacted her with a concern. Contrary to Mrs. Laveran, the other middle school teachers expressed frustration with the response of PC techs. They often had to wait a week or more for support. Due the pace of instruction, they often gave up on the lesson or project.

Overall, middle school teachers interviewed for this study felt that CPS expected the teachers to teach using technology in their daily instruction without providing sufficient support to do so. Mrs. Müller reported,

> When it came to technology, I've always kind of felt we're a little bit on our own in that sense, in our district. "We expect you to use this," but we aren't given as many opportunities for PD in the technology sense; I think that it has increased more as, within the last couple of years, than what it's been in years prior, but again, you know, utilizing . . . I tend to feel like I utilize people outside of the building that I am in this year, more than I utilize administration who is inside my

> building—and maybe that's just my comfort zone more, because it's a new building.

Mrs. Ross lamented the limited opportunities to continue improving her technology skills. She acknowledged that there were opportunities offered to teachers via one-day face-to-face PD events as well as online access to training. She referenced a district-hosted self-paced professional development portal known as Info-Host as a place where one might go to get training on technology. Both middle and high school teachers are able to log on this resource 24/7 free of charge. Even though she saw herself as technologically savvy, she stated,

> I would say that, yes, I am farther along than um, a lot of the teachers in the technology realm, just because that I am interested in that and I'm always trying new things. There are some classes online through Info-Host, but if you're not as computer-savvy to even get to take it online, then it is hard.

Mrs. Laveran also referenced other web-based training resources:

> I know they offer a lot of classes at the Intermediate School District (ISD) and the Regional Educational Media Center is an organization committed to providing media and technology resources to students and teachers, but I don't learn very well that way sometimes; I learn through experimentation, and I would just have to give that, probably, to myself.

Adding to her perception of lack of support from the district, Mrs. Ross stated that some teachers lack personal computers with which to practice their newly acquired skills beyond the school day. The issue of accessibility is important to mention here because it

highlights the inconsistency in PD experienced by middle school teachers who may have been motivated to embed technology into their daily practice. She went on to say,

> I think, technology accessibility for some teachers is a problem—we're at a point where we're not supposed to take laptops home anymore, like this year, we have the new laptops that are tied to the classroom, so they're supposed to stay in the classroom until we get our Smart Board, it'll be tied to that Smart Board.

High School Teacher Experience with Technology PD

The findings of this study reveal that high school teachers experienced professional development in technology differently than middle school teachers. This notable difference can be attributed to the differing expectations in how the two groups were mandated to implement pedagogical changes in how they taught using technology. Recall that teachers in high schools were mandated to integrate technology in instruction in a prescriptive manner through a blended learning environment via the Moodle learning management system (LMS).

Three of four high school teachers who participated in this study reported to have received a great deal of support in integrating technology in their daily practice via Carver Public School sponsored professional development events. For example, all teachers reported that at the time when they were mandated to teach under the blended learning model with rotation, they had to attend specific training on how to facilitate learning in a blended environment. In the blended learning model with rotation, students alternated between a face-to-face classroom and a classroom where they learned using online content facilitated by a teacher who specialized in interventions such as

differentiation and IEP accommodations. Apparently, the training focused primarily on how to navigate the social studies content that was housed on Moodle. The trainings/PD in which she (Mrs. Manson) participated connected to her own practice, her master's course work, as well as her work of supporting other teachers to integrate technology in their daily practice. Mrs. Manson stated, "I think there's been the foundation . . . um . . . I think sometimes the presentation isn't always the strongest for the teachers' understanding and adopting it." She used her own research that she conducted for her master's thesis to support what she was saying. Mrs. Manson stated,

> In polling the teachers that I work with, my research in technology showed that the expectation within our district is to be self-learners, but as teachers progress, they become less self-learners and want more hand holding . . . when I read up on why teachers struggle with using technology, is the lack of time to practice . . . I say give them time to practice it and solidify it . . . and provide feedback on how they're using it.

Mrs. Woods also reflected on the support that she has received from Carver Public Schools as she strove to implement the mandated changes in instruction using technology. In addition to the district-provided PD, she was self-efficacious in seeking outside avenues to bolster her technological knowledge. She went on to say, while working to increase her skills in technology; she worked with the district instructional technology trainer and learned about various tools such as Moodle and Gaggle.

As motivated as Mrs. Woods was to attend technology professional development, Mrs. Manson reported that not all teachers embraced the mandated changes as

enthusiastically. She pointed out that most teachers did not seek out outside PD nor were they excited to attend the mandated PD that Carver Public Schools offered. She recounted,

> Yes, there are some teachers that go to other PD . . . sometimes it overlaps on the weekends, but that's limited, and usually, it's more sporadic attendance from our teachers. But my history has been that when we did offer technology as a PD option, it was poorly attended. I wasn't a part of all the PD, though, either, so I don't know how many people were always present.

As evidenced by the findings reported in the preceding paragraphs, high school teachers were offered a substantial amount of professional development to support the mandated changes in technology integrated instruction. However, the impact of such support was minimal due to factors such as teacher beliefs and attitudes, the manner in which the PD was offered, and the support provided to the teachers after they had attended the professional development event (NSDC, 2001; Spillane, 2004).

Resources for Instruction Using Technology: District-Provided vs. Self-Sought

Exploring the theme of needed support to teach with technology, the conversation led to the issue of having resources with which to teach the required state technology standards (METS). All middle and high school teachers who participated in this study acknowledged that, on the surface, Carver Public Schools had plenty of technology within its system. However, when pressed for greater details, it appeared that teachers experienced unequal access to instructional technology. To explain further, teachers reported that when they were able to access the limited technology, the hardware was

often slow, and/or broken. Additionally, the professional development that was offered, if any, was not always timely. Although middle and high school teachers experienced the mandated changes in inquiry and technology differently, in the course of the interview they spoke of access to technology in the same manner.

As to the extent to which curricular materials support technology-integrated lessons, Mrs. Laveran stated, "No. I would say 'no.' I would say they give you all this technology, but really ultimately you don't get a lot of training on it and no support for it." The overall feeling of middle school teachers was that technology PD was sparse.

Mrs. Ross, who taught at the same school as Mrs. Laveran, corroborated this idea of having access to technology but also encountered problems with it. Furthermore, she also lamented not having enough time to hone her skills at home because she was not allowed to take her laptop with her. In thinking about her age and the increased proliferation of computers, she considers herself as having growing up in an era where few had computers at home, and while in college, she actually had to go to computer lab to use one. All this was to say that older teachers would have needed more support to meet the mandated changes in technology.

Mrs. Johnson agreed that, in her school building, the teachers had access to computers and knew how to access help if they needed it. However, the concern that she voiced was about the frequency with which the computers were unreliable. This phenomenon was not unique to Mrs. Johnson. In talking to her colleagues in the PLC, she stated,

> When I talk to teachers and when they tell me what is their hiccup, it is always that the technology doesn't work. Because they will cite how helpful the technology trainer was, in the PD trainings, and you know, they'll cite that I'm helpful with some of that stuff, too, because they know that I know a lot about different tools of technology, and they'll cite even their own understandings—but they just don't have the time to get it all set up and going for the students, because of the fact that the processors are slow and the computers may not be working for whatever reason, and we have kids that can log in to some of the computers but not the other computers so they are constantly having to trade computers around until they can log in. . . . I think that is for them the biggest hiccup in using technology. Because they do use the interactive white boards because they are always on; they use the digital projectors.

As conversation continued, it was evident that high school teachers had extensively used technology due to the fact that they had to access the content via Moodle. By the same token, teaching with unreliable technology dissuaded many teachers from meeting the expectations of the mandated changes in technology-integrated lessons. Mrs. Manson reflected on the frustration she and the teachers in her PLC experienced with the technology that Carver Public Schools provided. She said, "The school provides technology, and in comes the frustration of damaged technology, missing technology." Explaining further, Mrs. Manson speculated on other reasons as to why her colleagues were not implementing the mandated technology in their instruction. She

attributed it to the fact that technology-rich lessons are a lot of additional work that teachers are not always ready and willing to take on. She stated,

> The amount of work that goes to organize and facilitate the use of technology, and having the kids use it, and how they guide the kids through the activity [and] the oversight of the technology, is, I think, sometimes they [teachers] feel it comes across as too much work, and don't do it.

Even though Carver Public Schools had chosen Moodle as the primary learning management system (LMS), some teachers chose to use other web 2.0 resources to organize their instruction. Mrs. Woods expressed her resignation to the fact that if she were to support teachers in the implementation of the mandated changes in technology, she had her loyalty to the district-chosen LMS and let the teachers use their preferred tools such as Edmodo, wikis, and weeblys.

Teacher Beliefs Regarding Use of Inquiry as a Teaching Approach

After gaining an idea of what the participants in this study believed about the use of technology in the classroom, it was important to build on this conversation by exploring the impact of teacher beliefs on the implementation of mandated changes in how they taught using inquiry. The participants of this study were asked to reflect on the role inquiry-based instruction played in their daily practice. It was established in Chapter III that Carver Public Schools invested a great deal of money and time in providing its staff professional development in inquiry-based instruction through the 5-E framework/instructional model and the Disciplinary Literacy (DL) work through the Institute for Learning (IFL). Based on such investments, regardless of where they taught,

high school or middle school, social studies teachers in Carver Public Schools were expected to embrace and apply inquiry-based instruction with fidelity.

Middle School Teacher Beliefs About Inquiry-Based Instruction

All middle school teachers who participated in this study were resolute in the belief that inquiry-based instruction was essential in helping build students' understanding and knowledge of the concepts taught. Mrs. Laveran reported that she used inquiry-based instruction all the time in her classroom and felt that the mandate did not force her to do anything special or different. She reported,

> As far as inquiry, I teach that way all the time. I think that's just the teaching best practices. I don't think that, at least for myself, that I have to really think about well, how am I going to incorporate that [inquiry] into lessons? I think that if you are thinking about what's best practice, you will incorporate inquiry-based learning into your lessons.

Furthermore, she made a connection to her work as a Disciplinary Literacy coach as she worked to help teachers integrate a main Principle of Learning (POL) from the Institute for Learning: Clear Expectations. Her task was to help teachers make the learning targets evident to students. "I helped teachers with letting kids know the purpose of their learning, because our kids are not making the connections and now so we need to make those connections for them."

Mrs. Müller also expressed her belief about using inquiry-based instruction through the lens of her role as an instruction coach who was trying to help colleagues implement inquiry-based strategies in their teaching. She contrasted her experience of

coaching fellow teachers in the use of technology with the use of inquiry-based instruction. She felt that it was a little easier to coach younger teachers in the use of inquiry and technology than it was to coach older teachers in the same practices. Müller reported that the younger teachers in her building easily accepted inquiry; it was not the case with all participants.

All middle school teachers articulated their strong belief in the use of inquiry in instruction. Specifically, Mrs. Ross traced her use of inquiry in daily practice to her teacher preparation program. It was expected by her professors that she and her classmates would be good at developing tasks that provided students opportunities for inquiry.

High School Teacher Beliefs About Inquiry-Based Instruction

The high school teachers also believed that inquiry was important in building student knowledge and comprehension. Mrs. Johnson highlighted her belief in the importance of inquiry-based instruction by connecting it to the lesson that I observed as a part of this study. Just as she used technology to teach about the Great Depression, she also used similar content to further students' use of inquiry. During the lesson about the Great Depression, she asked her students to help the government address current economic issues by studying major economic events in American history. Her goal was to help students see that issues of the present are rooted in the past. She stated,

> I presented that problem to my students this way: "Let's take a look at recessions throughout the years and how the government, how people have created different things to help us get out of those [economic issues]—can we use some of those

> [solutions], or is there something that we could think differently?" So I have them research the Great Depression, the recession in the '70s, or just a couple of different recessions all along the way, just to see what new laws were put into place, or how people handled those recessions.

Furthermore, she continued to speak about how inquiry-based instruction increases student interest and buy-in. "But when you're in the room where they're doing the inquiry or using the technology, or doing the gaming/simulations/role play, they do seem to have their heads up more often; they are talking." Additionally, she explained the power of inquiry-based instruction as evidenced in her role as a DL coach. She noticed that in the classrooms where teachers were using inquiry-based instruction, students were so deeply engaged in the assignment that they ignored the dismissal bell.

Thus far, the findings for both middle school and high school have been consistent. Mrs. Manson's experience, however, offers a small point of disagreement with her fellow participants. Even though she believed in the powerful impact of inquiry-based instruction, Mrs. Manson provided an example of how she experienced a negative effect of teacher belief as it pertains to inquiry-based instruction. In her role as an instructional coach, she was expected to support colleagues in implementing inquiry-based methods in their lessons. When asked why the use of inquiry is not more prevalent in her school, she speculated that it was not more about fear, but rather deep-rooted low expectations for students. It also was important to mention the fear of losing control here, because it spoke to the teacher belief that if they use inquiry-based instruction, their students will struggle. If the students struggle, they might not get the content that the

teacher intended them to get in the time that they need them to get it. Later in this chapter, several impeding factors or obstacles to the full implantation of the mandated changes in pedagogy using technology and inquiry are explored. One of those factors is the teacher belief that students are not ready for this kind of learning. As a reminder, the experiences of the teacher participants are unique to them as individuals. However, due to the dual roles that they played in Carver Public Schools, teachers felt compelled to report on the experiences of the teachers with whom they worked day to day.

Middle School Experience with PD Pertaining to Inquiry

There was a major contrast between the professional development that middle school teachers experienced for technology, and their experience in the level of support received for implementing inquiry-based instruction. Overall, middle school teachers reported greater consistency in the PD received to facilitate embedding of inquiry-based practices in their daily lessons.

The teachers who participated in this study unanimously identified the professional development that they received through the Institute for Learning as their main source of PD for inquiry-based instruction. For example, Mrs. Laveran reported, "Well, for inquiry, I would just probably rely on IFL, really just good teaching best practices in inquiry." She went on to provide an example from a professional development that she had attended prior to being interviewed for this study. She said, "So, you know, maybe we're talking about different reading strategies, like our last PD, the Marginalia, and how that might lead to inquiry, but I think sometimes presenters have to make those connections for teachers." Marginalia is a literacy strategy in which the

reader interacts with the text by asking questions and inserting comments within the margins. Its goal is to build comprehension. An idea that had come up in the conversation with Mrs. Laveran was that, while participating in professional development, teachers often failed to make the connection between what they were learning and the mandate expectations. She believed that maybe the teachers needed to be told explicitly that they were learning an inquiry strategy in PD.

Mrs. Müller also referenced the PD offered by IFL. Specifically, she referenced a job-embedded PD that was conducted in the form of the coaches' Professional Learning Community (PLC). Disciplinary Literacy coaches, middle and high school, met three times monthly to reflect on the support that they were providing to their fellow teachers in their respective schools. Their monthly PLCs were supported by an IFL Fellow who specialized in constructive inquiry-based practices in history/social studies. Mrs. Muller concluded her thought by saying,

> Our coaches' PLCs have been a great support in helping broaden my horizon and in taking that back into my own classroom, and then this year, in taking it back to my building for my teachers, and even utilizing it in the modeling phases and the cohesion phases, as well.

Furthermore, Mrs. Ross spoke about her experience with IFL, acknowledging that the professional development had been helpful in changing her practice. However, she was quick to point out that even though she valued the training received at the time of this study, she needed more. She stated,

> In reference to the inquiry-based instruction . . . learning how to question, how to probe students to go deeper, I feel that's something that I could use more work on because it's also something that students struggle with so much.

All talked about the professional development that they had received aimed at helping raise achievement for language minority or English Language Learners. Because of large populations of English Language Learners, all participants were training in a strategy known as Sheltered Instruction Observation Protocol (SIOP). The main goal of SIOP is to incorporate language acquisition and constructivist strategies, such as verbal and visual modalities and graphic organizers, into instruction to build comprehension. Mrs. Boykin asserted,

> I like the SIOP training. There are things in the SIOP model that I just do because it makes sense to me. Sometimes I try to think, what was it that I enjoyed as a child learning this—what was it that was interesting to me?

She went on to mention various other professional developments she received like Thinking Maps, quality questioning, and other strategies to help her answer the "why do I have to know this?" question often asked by students.

It was notable that even though Carver Public Schools reported that it was intentional in purchasing social studies resources that were considered to be inquiry-based and provided teachers with professional development in the use of these resources, only one teacher who was interviewed for the study referenced that training as source of support for inquiry. The resources were called History Alive! Economics Alive! Government Alive! Geography Alive! and Social Studies Alive! These resources were

developed by Teacher Curriculum Institute (TCI). The discussion of inquiry-based textbooks or others was fully explored by the teachers in responding to questions regarding resources for inquiry-based instruction. In making connections to the lesson that I observed for the purpose of this study, Mrs. Boykin postulated,

> The book is not inquiry-based, but it's easy to adapt. I have to work a little harder and I have to be a little more specific with my inquiry for the India unit because most . . . most American students know very little about India.

Overall, the four middle school teachers who participated in this study saw teaching using inquiry methods as important. However, the professional development received toward that end varied. The unifying and consistent support came from the professional development received through the Institute for Learning. Middle school teachers recognized the need to keep honing their skills in the use of inquiry-based instruction.

High School Teacher Experience with PD Pertaining to Inquiry

In reflecting on their experiences with professional development in the area of inquiry-based instruction, all high school teachers interviewed for this study affirmed that they had received a "lot" of support from the Carver Public Schools. As Mrs. Manson put it,

> I think they have been made aware of a variety of resources. We have them through our Curriculum Guide. We [teachers] get continuous emails; they're offered at PD, whether it be in PLCs. You know, I think that varies throughout the district and what kind of exposure they [teachers] get.

She went on to explain that the downside of too much information is that she and her fellow teachers started drowning in data. She said,

> I think what happens is they have so much, they don't know what to pick and how to choose. . . . Um . . . I think maybe a scaling back of what we use, and then reinforcement of those few things; instead of using a ton. There's so much out there.

Mrs. Johnson also agreed that she and her colleagues had received or were offered an inordinate amount of professional development in the area of inquiry instruction. She recounted, "IFL is very much centered on a problem-based method, through inquiry and the DL model." She went on to explain that in the building where she taught, according to her principal,

> The standard is a more student-centered learning environment . . . a lot of our PD is focused on this . . . the principal really likes the PD to be hands-on, and using inquiry for the teachers, so that teachers see what inquiry looks like. And they've [administrators] really been kind of pushing students-centered learning in the classroom, and not so much teachers standing up and just delivering instruction.

Resources for Inquiry-Based Instruction

In keeping with the theme of supports for inquiry-based instruction and technology integration, teachers were asked to talk about instructional resources to which they have access. The response from middle and high school teachers varied slightly due to the fact that high school teachers were mandated to integrate technology into their

instruction via the Moodle learning management system, while middle school teachers had more choice.

High school: District-adopted, self-sought, and teacher-created resources. In reflecting on their resources to which they have access that supported their teaching using inquiry-based instruction and technology, all high teachers interviewed reported that they had access to resources that could be used to teach social studies in the mandated manner. Mrs. Manson referenced the district-provided common syllabus that was accessible via Moodle and shared drive called "Curriculum" as a source for knowing what to teach and how to teach using inquiry and technology. She said,

> I know in our common syllabus and standards we have it where the kids have to do inquiry and do research and look at a variety of sources. Look at a problem and see how to solve them using outside the district resources, outside of their textbook.

Connecting the notion of ready-made resources for inquiry-based instruction to the teachers with whom she worked as a DL coach, Mrs. Manson reflected that teachers were given so many resources that they were often paralyzed by choice:

> I think they have been made aware of a variety of resources. We have them through our Curriculum Guide; they get continuous emails; they're offered PD, whether it be PLCs, you know, I think that varies throughout the district and what kind of exposure they get. I think what happens is they have so much, they don't know what to pick and how to choose.

Mrs. Johnson, a teacher and coach at a SIG school, talked about how her use of technology in lessons supported both inquiry and technology mandates:

> So I think they're learning a lot of skills: they're learning typing; they're learning researching; they're learning how to bring it all together—which aligns really well to the inquiry, because that's what inquiry is—it's here's this problem here, how are we going to solve it? And then they go off and they do the research to try to find those solutions. It aligns the standards, too, if it's presented in this way.

She stated that social studies content lends itself well to inquiry-based instruction.

Middle school: District-adopted, self-sought, and teacher-created resources. As previously stated, the main difference in how mandated changes in inquiry and technology between high school and middle school in the Carver Public Schools was that middle school teachers were given more freedom in how they implemented the expectations in their daily practice. Mrs. Müller shared that the access that she and her colleagues had to teaching resources improved a great deal from the time prior to this study. She credited the increase to SIG:

> This year, again because we have the school improvement grant, we were able to purchase much more of those materials—a lot of literature, both historical fiction and nonfiction, multi-genre, multi-grade, you know, level type reading. Um, we still spend time looking for different types of sources online, political cartoons, primary photos, and things of that nature.

She went on to add that it was not difficult to find resources to teach in an inquiry-based way in social studies:

> With social studies, I feel it's quite easy, because we do so much with various types of sources. We can do so much beyond the textbook, whether it's primary photos, whether it's analyzing music, political cartoons, and primary sources of all sorts of types. And also we have been pulling in historical fiction, and having them look at maybe the same subject matter or the same theme, but look at it from different perspectives, and seeing similarities and differences in different types of literature or different types of primary sources. So I think for us, it lends itself very easy to inquiry-based instruction for our content.

Ease of access to resources was echoed by Mrs. Laveran, who postulated,

> We looked at a map for the target tab, and it lets me know, even just by walking around, which students can read a map and those who can't. Then I can individualize some attention; you know, this kid doesn't know how to read a map, I'd better make sure I address that with Joe Blow . . . vocabulary, but not necessarily copying from the book.

Administrative Support

Middle and high school resources allocation. A major theme that was often discussed in the literature (Elmore, 2006; Spillane, 2004) on policy implementation and compliance with mandated changes in schools is the support that an administrator gives to such initiatives. When asked about the kind of support that they received from their administrator, all 7 participants reported having received administrative support as they worked to meet the mandated changes in inquiry and technology. However, this acknowledgement of support did not mean that the support was uniform across grade

levels or school buildings. To explain, two middle and two high schools that participated in this study were considered School Improvement Grant (SIG) schools. As SIG schools, the entire teaching and administrative staff was required under the grant provisions to participate in Professional Learning Communities. However, there was little accountability for fully participating in the PLCs. Furthermore, for the schools that were considered non-SIG, PLC participation was voluntary.

Whether in middle or high school, administrators in SIG schools had to allocate time for teachers to meet regularly to learn new technology and inquiry-based strategies as well as reflect on the impact of those strategies on student learning. As previously mentioned in the section of this chapter introducing the participants, middle school teachers Mrs. Laveran and Mrs. Müller served as DL coaches, whose responsibility was to facilitate Professional Learning Communities in the school where they were based. Mrs. Woods, Mrs. Manson, and Mrs. Johnson played similar roles in the high schools. Mrs. Ross taught at a SIG school. She worked closely with Mrs. Laveran, the DL coach. Mrs. Boykin, however, was not was not based at a SIG school. There is a DL coach assigned to work directly with the teachers at her school. It is important to distinguish the SIG and non-SIG schools, because SIG school teachers were under greater scrutiny to change instructional practices and improve student achievement. Failure to raise achievement threatened dire consequences from the state, such as the replacement of 50% of the teaching staff. They were also bound by a letter of agreement (LOA) that they had to sign upon accepting a teaching position at a SIG school. The LOA outlined specific expectations of working in a SIG school that went beyond the negotiated teacher contract.

When asked about administrative support in facilitating their implementation of mandated changes in inquiry-based instruction, all middle and high SIG teachers and non-SIG middle school teachers said that their administrator or direct supervisor provided a great deal of support. However, in SIG schools, participation in PLCs was dictated by the grant requirements. Additionally, teachers were paid a stipend for participating in PLCs. Mrs. Ross, who was also based in the same building as Mrs. Laveran, corroborated that those participating in PLCs were paid. She added that because they were required and paid, teachers were forced to take them more seriously.

> Yes. PLCs are paid, and so I think if it wasn't, if we weren't paid, it would be more informal, hallway chatter, which, you know, we always seem to do, anyways, after school on Fridays. But this is a formal thing that we are required to do under the SIG contract.

In contrast to the SIG schools, Mrs. Boykin, who taught at non-SIG school at the time of this study, also reported that her administrator made provisions for her to participate in a PLC. The difference between her PLC and the SIG schools was that it did not meet as frequently, nor were the teachers paid for participating. She explains her experience with PLC: "No, there is no extra pay. The first Monday of the month we usually meet as a social studies group here in the building, and we work on projects that we're trying to develop or implement." As an older teacher, Mrs. Boykin cherished the time that was allocated for her to network with her colleagues. Specifically, she enjoyed the support that she received in technology from the younger teachers, whom she perceived as being "more tech savvy." Her reflection about learning from her "more

technology savvy" colleagues is a form of professional development that will be explored later in this chapter under the discussion of collaboration with others.

Mrs. Müller reported that her direct supervisor provided support through PLC by allocating time for the staff to meet. She was able to bring in external experts to help build teacher capacity in the use of technology. Mrs. Müller reported,

> We don't have a computer class. So bringing in an outside expert to help myself and the teachers that I work with, um, feel a little better about incorporating technology, outside of just using the tech-carts and the Elmo—really getting kids utilizing technology, and realizing how blogs, or classroom set-up sites, where students can share work digitally and stuff—so we had to go out, still within the district but not within our building, to bring that area of expertise in.

When asked to elaborate on how the support that she received from her principal directly helped her meet the expectation of the mandated changes in inquiry and technology, Mrs. Müller stated,

> Technology support in that she's [principal] made sure we have it, for sure. She's great. If I say, you know, we want to try this, but we don't know how to use it, saying, well, let's make some calls and find someone who can come in and show us how to do this. So if I ask for it, the support is there.

As a DL coach, Mrs. Müller was able to solicit specific support from the administrators on the behalf of the teachers in her PLC. She went on to explain receiving support in teaching with inquiry:

> Inquiry support, I think again . . . if I . . . in having money to purchase specific resources to utilize within that inquiry-based instruction format, she's [the principal] very supportive; she has been very supportive in that, again, if I ask for something, or I can show the validity of the need, she has been supportive in that sense.

Mrs. Ross highlighted a noteworthy phenomenon in her response to how she experienced administrative support in that even though technology and inquiry were mandated equally across Carver Public Schools; principals emphasized one area over the other.

> They [administrators] are very supportive in the technology. He's used the SIG money to purchase a lot of the new technology for our students, so I would say there's a big push, especially even at Governance Board. We've been encouraged to make sure we are presenting on at least one technology lesson that we've done.

Mrs. Ross' experience was that because the principal spends a lot of money on technology, inquiry-based instruction was not pressed. To explain, Governance Boards in Carver Public Schools were designed as a mechanism through which teachers reported how they were increasing student achievement. Governance Boards were composed of a building administrator (e.g., principal or assistant principal) and district-level administrators (e.g., deputy superintendents, executive directors, and various supervisors). In the case of SIG schools, the aforementioned individuals present at the Governance Boards were state-appointed school improvement coaches and Intermediate School District (ISD) support personnel.

The theme of administrative support in the use of inquiry and technology was developed further as participating teachers were asked to reflect on the accountability measures that were in place to ensure implementation of inquiry and technology in their daily practice. Accountability in the form of the Governance Board meeting was reported by all participating teachers. They were being held accountable for reporting academic performance on units, tests, projects, or summative assessments.

Mrs. Ross, who was teaching at a SIG middle school at time of this study, reflected on her experience with Governance Boards:

> Yes. It's a body that we report to 4 times a year, and we have to present our findings on SMART Goals that we have developed for ourselves, usually wrapped around an assessment we have given our students, and they want to know what we've done in order to help them achieve, also in making our SMART goal when it comes to that assessment, that particular assessment, and what services we provide for the students, what's working, what's not.

SMART Goals represent goals that are Specific, Measurable, Attainable, Results-Based and Time-Bound. Goal expectations for all teachers in Carver Public Schools were as follows: Tenured teachers had to write a minimum of two goals—one goal on individual area of growth in instructional practice, and a second goal aligned to the district's academic plan. Probationary teachers had to write a minimum of two Individual Development Plan (IDP) goals with multiple strategies.

Inasmuch as the Governance Board process and the administrators involved in it were supposed to help teachers reflect on their practice as they implemented mandated

changes, 3 of the 7 teachers felt that their administrators did not fully understand the mandates that they (administrators) were supposed to be supporting.

Mrs. Laveran echoed the sentiments of Mrs. Johnson about administrators not fully understanding the mandates to which they were expected to keep teachers accountable. She said,

> So our principal, to be real honest, a lot of times I think that it's just a directive given by our administrator, who doesn't really know what that means, whatever it might be—"Okay, now I want everybody on our staff to use close and critical reading"—because that's a district initiative; but I am not really sure sometimes if he really knows what that means. You know, it's the blind leading the blind—and not with everything, but I do feel that way often.

Three of the 7 teachers who participated in this study saw principal support, accountability measures such as walk-throughs, instructional conversations, and the Governance Board process as means of keeping tabs on the teachers. Even though Mrs. Laveran understood the need for accountability and follow-through on the part of the administrators, she lamented the fact that her building principal did so only out of mistrust and from the belief that without administrative press, most teachers would not work to implement district initiatives or mandates. She recalled overhearing an administrator in her building make a comment about teachers: "I heard them [administrators] say, 'They [teachers] can't be trusted'—that's how they [administrators] feel. Teachers can't be trusted." While asserting her feelings of mistrust, she went on to acknowledge that without administrative press, some teachers would not have changed

their practice. She cited research she read that suggested only 5% of teachers in U.S. schools are doing what is necessary to facilitate student success. She reiterated that a reason why some teachers do less is because they have a lot on their plates.

Administrative support was discussed in terms of providing resources and allocating time for teachers to meet in PLCs. When asked to reflect further on the question of what was supporting their implementation of inquiry instruction and technology integration, all teachers who participated in this study reported that the time spent collaborating with colleagues was indispensable. Exploring this theme further, teachers outlined how such collaboration took place. In some instances, they talked about the formal structure provided through PLC and other informal structures such as collegial conversations about what they were trying and how things were working in their classrooms. Such interaction is described in detail in the following paragraphs, beginning with the formally structured Professional Learning Communities and then the informal gathering of teachers to exchange ideas and make sense of the mandated changes.

Administrator Facilitated Collaboration with Colleagues

Formal collaboration through PLCs. As previously stated, two of the three participating high school teachers worked in SIG schools. Charged with facilitating PLCs and modeling best practices in technology integration and inquiry-based instruction, they too reported a great deal of administrative support. Similar to middle schools, the administrators allocated time for teachers to regularly meet in a formal Professional Learning Community. In SIG high schools, PLC times were governed by a Letter of Agreement (LOA), in which teachers agreed to fulfill the obligations of teaching in a

school that needed improvement. Mrs. Woods confirmed the support when she stated, "I can honestly say that, yes, my building administrators have supported our initiatives." A major distinction between middle and high school teachers who taught in SIG schools was that pay was not a motivator for implementing the mandates. Even though they were paid to participate in PLCs, high school teachers were more resistant to change. For example, only 4 out of the 7 teachers in her PLC worked to incorporate the mandated inquiry-based instruction and technology integration into their lessons. At best, the integration was planned only if they were given opportunities to do so during the allotted PLC time. Mrs. Woods said of her colleagues,

> Our PLCs are paid, because we are a SIG building. However, when you really look into it, I can say four of my seven teachers who don't care for the mandates, they're gonna have to be sitting there right in our PLC to do it, because they won't do it on their own.

Furthermore, as a means of keeping everyone accountable, teachers were required to submit minutes and notes from PLCs. Mrs. Ross recalled, "We have to turn in notes, minutes, um, agenda, our signatures, and so on. So it's very formal. But what's discussed I think would be discussed anyway, you know, as a group at any time." When asked if they received remuneration for this meeting in PLCs, the SIG schools reported in the affirmative. Mrs. Boykin, who worked at a non-SIG high school, reported that the PLC meetings were not paid and that the teachers did not sign a Letter of Agreement to take part in it. In her experience, participation depended greatly on the value that the teachers in her buildings placed on PLC meetings.

PLC was a common structure across all schools, even though the time spent meeting and the frequency of meetings varied. Middle school teachers reported that time spent with their colleagues helped support their implementation of mandated changes in technology. Mrs. Laveran said, "Mostly, what I know about technology I just learned through experimenting on my own." Even though she learned a great deal about technology on her own, Mrs. Laveran, in her role as a coach, would ask fellow teachers to bring ideas to share in grade-level team meetings. "We want you to talk about what one inquiry strategy you're using in your classroom that works; tell us one thing that you've done with technology that has worked in your room, just to build your toolbox."

The idea of teacher collaboration was also supported by Mrs. Ross, who said, "I think just supporting each other and telling each other what we are doing, and going to each other if we have problems." Mrs. Ross recounted how teachers leaned on one another to make sense of PowerSchool. PowerSchool is Pearson Corporation owned student information management system that was being piloted in Carver Public Schools at the time of this study. There appeared to be great pride in middle school teachers as they articulated how they shared resources for technology integration with fellow teachers. Mrs. Laveran was happy to help find Internet tools to help fellow teachers address literacy. She talked about finding iPad apps from (Barron's Painless). Some of the titles in this series are: *Painless Algebra, Painless Poetry, Painless Writing and Painless Reading Comprehension.* "I found *Painless Spelling, Painless Grammar.*" Furthermore, as a DL coach, Mrs. Laveran intentionally sought specific technological support for her colleagues from technology trainers. "We had Mrs. Howard in our PLC.

She came in and trained us on Gaggle, Moodle and Socratic." When asked about how valuable they found this time, the middle school teachers said the time spent with colleagues was of great value.

Informal collaboration through PLCs. In contrast to their high school counterparts, all middle school teachers that participated in this study organized themselves in order meet beyond the required SIG meeting times. The teachers worked with a technology specialist at one of the SIG schools to explore ways in which they could integrate technology into their instruction. Mrs. Laveran reported,

> There is a class called "Wired Wednesday" that is offered by our tech person, where she may have a, she may send out an e-mail announcing, "This is what I'm thinking about offering on Wednesday—what's the interest?" Or, you can email her with ideas. You know, if you're struggling with Microsoft, I don't know, Publisher or Inspiration, she might do a half-hour class on that. As far as inquiry goes, I guess there is some PD about inquiry, but not really any that's just called "inquiry"—it would just be embedded in, you know, if we have a Social Studies PD, inquiry might be embedded into that PD.

All PLCs were considered job-embedded professional development because they met the following criteria: It occurs during the workday and in the workplace, and is closely connected to the actual work of teachers in classrooms with their current students, designed to improve teachers' instruction, intended to improve student learning, centered on the academic student needs of the school, and directly linked to the goals set for students by the team and school (Hirsh & Killion, 2007, cited by Fitzgerald, 2009).

The meeting of Wired Wednesday was funded through SIG. It took place after school, and teachers were paid a stipend for attending. Mrs. Laveran stated,

> And I do know that as the year winds down, our Wired Wednesdays PD person is going to discontinue that, as they have been given the directive that they are not going to be here next year, so they have to start backing off.

She was speaking to the fact that SIG was expiring at the end of the year and there would no longer be funds to pay stipends for activities such as this. Mrs. Ross reflected on her experience with Wired Wednesdays in that she enjoyed hearing ideas of what has worked with students from her colleagues.

> I would say that's a big part of it. And then sharing what works well at our team meetings—we're able to say, "Hey, I've used Edmodo that worked well with our students," and so that might encourage other people on our team. Now that they know that our 6th graders have used it before, they might be more apt to try it, because the students have had experience, and they're not the ones that are initially introducing it to them.

When pressed whether the teachers would actually meet without being mandated to do so, Mrs. Ross felt that teachers would still meet to collaborate.

> I think we would probably meet as a team even if it wasn't mandated, but we have a formal meeting time. Um, it's at least once a month we meet for an hour and a half as a 6th grade team and we discuss student concerns, joys of what has happened, what went well in our classroom, and it's a way to just support each other with curriculum and with the students.

Mrs. Boykin, who was based at a different school from Mrs. Laveran, expressed her experience with a Wired Wednesday type of event, where she and her colleagues collaboratively planned inquiry lessons, shared ideas about technology integration, and talked about specific plans to help build inquiry skills in their students. Her recollection is as follows:

> Mr. Conklin has a very different style than I do, so I often pick up more inquiry-based ideas from him. . . . But at the building level, we do get together and work on close and critical reading; we do, if we need something with inquiry, we talk with each other. I especially like the PLCs where we get together with other 7th grade teachers in the district and get to plan, you know, they have ideas.

It is important to note here that these teacher gatherings were voluntary and informal.

High School Teachers' Experience with PLCs

Like their middle school colleagues, all high school teachers who participated in this study also spoke favorably about their experience in working collaboratively with fellow teachers in order make sense of the mandated changes in inquiry and technology. The collaboration took place mainly in the principal-ordained formal PLC structure. Mrs. Manson related her experience with PLC: "We have PLCs in buildings, and depending on what building you're in, the frequency in which they meet and the time which they meet varies." Additionally, Mrs. Woods reiterated the fact that she was self-driven to learn about inquiry and technology on her own; however, she fondly recalled specific assistance that she received from one of the colleagues: "I think it was a lot of on-my-own learning plus collaborating within our small Social Studies PLC. I know Mr. Bonner

[a fellow teacher] showed a lot, he shared a lot with us." She also spoke of various PD opportunities offered by CPS in tools like Education 2020 (E2020), Novanet, and Moodle.

Mrs. Manson remembered how the PLC time was used in the past. Looking at PLCs through the lens of a DL coach, she recalled that much time was spent on exploring technology tools, how to use certain programs, classroom management tools, and inquiry best practice examples. However, in her estimation, despite all these experiences, some teachers did not touch the resources beyond the training in the PLC.

Furthermore, Mrs. Woods explained that as a coach she brought a breadth of expertise to the PLC when it came to helping her colleagues make connections to the training they had received in inquiry through the Institute for Learning (IFL). Because she had taught both ELA and social studies, she was expected to attend professional development in both subject areas. She believed this experience came in handy when working to support her colleagues in inquiry-based instruction.

> Because I have that background in both ELA and social studies, I had the luxury of experiencing both sides of that IFL, from the ELA's version of the Patterned Way of Reading and writing and thinking, to the social studies version of the "think like a historian."

Not only did she support her colleagues in inquiry, but also helped build their technological skills by creating an online environment where the teachers could continue to exchange ideas beyond the PLC times. Unfortunately, to her disappointment, only 2 of the 7 teachers in her PLC actually posted any reflections on the site.

Connection to National and State Standards

Since district policy of mandated changes in inquiry-based instruction and technology integration was in response to National Standards and State Standards/Grade Level Content Expectations (GLCEs) and High School Course Content Expectations (HSCEs), teachers were asked to reflect on the question, "Whose responsibility was it to make sure the students have the skills needed in inquiry and technology in order to meet the standards?" As discussed earlier in this chapter, all the teachers who participated in this study placed the responsibility squarely on themselves and their colleagues. Even though they believed that students needed these skills to succeed on the standardized tests and function as a productive member of society, only 2 of the 7 teachers explicitly mentioned the standards in their responses.

Mrs. Woods placed the responsibility squarely on her shoulders and the shoulders of society:

> I think it's society's problem to teach our children about technology; we all have a voice in it. Well, those are our National Education Technology Standards (NETS); we're all responsible for them. I think the sooner they [teachers] realize that inquiry with the technology is going to be necessary for these new SMARTER Balance and MEAP tests, um, and how it just supports learning initiatives all the way through the system, and for even for AP students, how it affects them . . . and prepares them for college—I don't see how we cannot integrate the technology with our curriculum.

Expanding on her thoughts, Mrs. Woods stated that teachers did not have to work very hard to find resources that connected to the standards and to inquiry.

> Well, with the online textbooks, those timelines are already hooked up to it and linked to it, so they're just a click away. I feel as though that the social studies teachers, and all teachers, they don't know the basics of those NET standards. So in the process, because we've put them out there, we really haven't supported them unless you've really searched them out. So when we have those conversations, a lot of people don't know about Creative Commons or even how to cite those sources when you reference them in your papers.

Similarly, Mrs. Manson made connections to the standards:

> Because teachers decide the goals and standards and how the kids are going to meet them, and if and how they are trying to or getting them to there . . . teachers don't necessarily set the standards, but how they interpret them and apply them [standards] to the kids reaching them varies, and so if their [teachers'] approach is limiting, and they try to lead or tell the kids how to do it and what to think, I don't think the inquiry is present. Maybe some of the exposure is there, but it will be limited.

Mrs. Johnson reflected on how important it was for teachers to consider the standards and the goal of increased student achievement. She said,

> Well, I think there's a strong connection between inquiry and standards. Even on the ACT test, I see where when you run a classroom using inquiry methods—and there is tons of scientific research about this—and several different school

> districts who have shown incredible growth just by using inquiry methods, as far as in relation to state testing—so I think there's a strong correlation to that.

Mrs. Johnson was mindful of the pressure placed upon her and her colleagues to make sure student achievement is reflected in the grades. She had strong beliefs that such emphasis on grades diluted the inquiry process and academic rigor. She touched on this by saying, "As far as the grades, I don't necessarily think that there is a strong correlation. I feel like the grades are more of what the activity is, more than the skills the students are doing." Mrs. Johnson expressed concern about the widespread use of fill-in-the-blank handouts that she saw in her colleagues' classrooms. In her estimation, students were receiving high marks for work that was not rigorous. In essence, her feeling was that technology and inquiry raised the level of rigor in the classroom that would not have been present in their absence.

Disparity—Have and Have-Nots

In talking about access to instructional materials that support technology integrated lessons, a major theme that surprised me was the unequal distribution of technology across the district. Three of the 7 teachers interviewed for this study referred to this disparity as "the Haves and the Have Nots." Mrs. Ross, a middle school teacher, worked in a SIG building that had a lot of resources allocated to it in hopes of increasing student achievement. She touted her knowledge of technology:

> I would say that, yes, I am farther along than, um, a lot of the teachers in the technology realm, just because that I am interested in that [technology] and I'm always trying new things. I think Booker T. [middle school] is farther than other

> schools with technology, because we have had access to technology. There are schools that don't even have iPads yet. When we went to the district PD a month ago, and we were able to talk about it [technology]. I went to the [PD] on E-books and then also another technology-oriented one, and some of the schools who were there shared, "Well, we don't even have an iPad lab at school; we can't use this, we don't have the Nooks" . . . which we also have a Nook lab. You know, we have the benefit of having the technology, so it makes us interested in learning how to use it, and not letting it sit and wait.

In essence, without access to requisite technology, a teacher was less likely to implement the mandated changes.

Mrs. Müller, who taught at a different school than Mrs. Ross, used the exact terminology to refer to the inequity of resources for technology integration even within the schools that had the SIG funds. Schools did not spend their money to acquire the same resources. She explained:

> I think across the district there is a vast difference between who has access and who doesn't, but also, what we have access to—we have some buildings with iPads and tablets; we have some buildings that have very old laptop carts, with no iPads, no tablets. So, although we have technology to use in our district, we don't have it consistently.

Among middles schools, even though SIG schools had money, there was a difference in the technology that was purchased in those schools.

Mrs. Laveran, who taught in a SIG school, echoed this sentiment:

> I think there are the haves and the have-nots, even within CPS, and a lot of it is because of the SIG grant, you know, the schools that got the SIG money have, and they have more things than they know what to do with. And principals are still sitting on a million dollars. And then we have schools who are still writing on blackboards. So it's even inequitable within our own system. I mean the haves and the have-nots. And the SIG grant created that—The grant is good, I am not knocking the SIG grant, but it also has created some real inequities.

Mrs. Boykin, a middle school teacher, lamented that fact that she was not located in a SIG school. "For those of us who are not at SIG schools, the . . . inaccessibility of technology is extremely frustrating." Unfortunately, Mrs. Boykin wished that her school was a failing or low-performing school so that she too could receive school improvement funds that could be spent on technology and other teaching resources.

Changed Teacher Instructional Practices in Inquiry and Technology

In order to understand how teachers experienced mandated changes in how they teach using inquiry-based instruction and integrate technology into their daily practice, five questions on the interview protocol were designed to push the participants to deeply explore the essence of their experience. Teachers were asked to reflect on how they were using inquiry instruction and integrating technology in their classrooms.

Whether they taught in high school or middle schools, all participants reported that they were using the inquiry and technology in their daily practice. First, I discuss how teachers saw changes in their practice pertaining to the use of inquiry in their lessons, followed by explanations of how participants of this study used technology in

their lessons. In both instances, I will summarize the experiences of middle school teachers, followed by summaries of high school teachers' experiences.

Mrs. Boykin, a middle school teacher, reported her use of inquiry:

> I like inquiry because it makes the student think, so that they're not such a passive learner. . . . classes are all different. Sometimes you'll get a class where you get, they're just naturally more willing to share than others, and there are some classes where it is painfully difficult to get some of them to speak.

Since inquiry involves knowledge building at the individual and group levels, student collaboration is important. Additionally, she articulated how the mandates in inquiry-based instruction had forced her to be more diagnostic in how she approached her lessons. Specifically, because the majority of the students she taught were English Language Learners, she applied inquiry methods to help them better understand the intended learning.

Knowing her students' weak tests scores in reading comprehension; Mrs. Boykin explained how she could not separate technology as a means to do inquiry:

> I'm not using technology as much as I would like to. I . . . with the urgency I feel to get them ready for the Common Core State Standards and to cover my curriculum, I'm, at this point I'm not willing to waste a lot of instructional time fussing over computers that don't work.

Mrs. Laveran likewise talked about how her practice had been impacted due to mandated changes in inquiry. She reported that she had always been inquiry-minded in her teaching. She stated,

> When I teach, I use inquiry all the time. I think that's just the teaching practices. I don't think that, at least for myself, that I have to really think about, well, how am I going to incorporate that into lessons? I think that if you are thinking about what's best practices, you will incorporate inquiry-based learning into your lessons.

By the same token, she spoke about her experience in implementing the changes in technology; she admitted that she was weaker in her use of technology in instruction. However, she was very intentional in making sure she integrated it when she could. Reflecting on her experience broadly in terms of her role as an instructional coach, she said,

> And my weakness is definitely technology. I know a lot of different strategies and lot of different skills for inquiry, but throwing technology in is very difficult for me. It's not because I fear giving up control, it's not because I don't think the kids are going to do what I ask them to do, it's because I'm not comfortable enough.

Because the teachers were given time to collaborate with colleagues, they were asked to talk about how teachers are receiving these mandated changes. Mrs. Boykin thought that

> inquiry is more accepted; it's more of, uh, a lot of teachers' everyday delivery and design. That was a big change for a lot of us; that was a big shift in lesson design and delivery, but I think we're making progress as a district—that's just my feeling about it.

Mrs. Müller spoke about how she observed changes in her colleagues' practice. When asked if other teachers had bought into the mandated changes in inquiry-based instruction and technology integrated lessons, she said,

> I think that some of it is becoming more intentional. I do notice that there is thinking a little bit more outside the box, and trying to approach things a little differently. I do see technology being used more this year than I probably have in any other year past. Our teachers, all content teachers have received Smart Boards in their rooms. So I see some of that being utilized. We have laptop carts on every floor, so I do see those being pulled into classrooms often.

She pointed to several examples of 6th grade students in her building doing large projects using technology. They were creating podcasts, travel brochures, and other digital presentations. She talked about how her current experience was a great departure from what she experienced at a different building were teachers had to "play tug of war" with laptop carts and digital projectors.

High school teachers who participated in this study also reported notable personal changes in how they taught using inquiry and technology as a result of the mandated changes. Interestingly, because of their dual roles as classroom teachers and Disciplinary Literacy coaches or Instructional Coaches, the three high school teachers spoke of changes in technology-integrated lessons and inquiry-based instruction in terms of changes they did or did not observe in the teachers with whom they worked. Regarding the use of inquiry, all high school teachers reported that the teachers in their respective PLCs were trying to implement the mandated changes. For example, Mrs. Johnson said,

> As far as the inquiry thing, I've seen pockets of it. There's still a fear. I feel like the fear is because there's such as emphasis on grades, and when you move to inquiry method, the kids grades do go down until they understand their role in the inquiry method, and then the grades will go back up. But because of people looking in their grades all the time, they have this fear that if the grades go down, they're looking like a bad teacher.

The teachers in Mrs. Johnson's building were willing to try something new only when they were encouraged by a colleague to take a risk on something that has worked. She recalled how she coached a reluctant teacher to try gaming/role play as a way to teach using inquiry method. Because of her position as a DL coach, she was able to encourage a colleague to try gaming or simulation with his students because he trusted the DL's judgment. He reluctantly tried it and, to his surprise, it worked wonderfully. At the time of this study, the teacher about whom she spoke was still doing gaming as a tool for inquiry. Mrs. Johnson said, "I think when they see the success, they keep it going. But until they feel it is successful, they're hesitant to use it."

Mrs. Woods, a teacher and coach in a different building, also acknowledged that she and her colleagues were using inquiry methods in instruction. She recounted a story of a teacher in the PLC who wished to do an inquiry-based lesson but feared it might not work as planned.

> It's just the fact that the teacher was willing to take inquiry, try it in class, have it not go as planned and bring it back around and make it work somehow else, show he was willing to take a risk on something new.

Mrs. Woods' statement spoke well to the question of why some teachers were not using inquiry and/or technology in their classrooms.

Changed Practice via Peer Modeling

All participants of this study were asked to reflect on the reasons why they and their colleagues were not buying into the mandated changes in inquiry and technology. Digging deeper to the essence of their experiences, all teacher participants stated that the main method for changing the mind of reluctant colleagues was to have the early adopting teacher model the expected behavior. All teachers in this study, DL coaches or not, agreed that they worked hard to model lessons for their colleagues so that they can see students "like their own" successfully engaging in inquiry-based lesson and technology-integrated lessons. Mrs. Laveran stated,

> I guess I might just model for them, or even show them in conversation: this is what I've done and it really worked for me. You might want to try it; you might be surprised at what you can get your students to do. After, we can talk about what worked and what didn't work.

Another participant related how much she learned from observing a colleague who was teaching her students Close and Critical Reading skills by having them read text digitally, highlight relevant information, and toggle between two screens to answer questions on an assessment. The teacher who was being observed said that the digital read, highlight, answer questions activity was her way of preparing students for the Common Core State Standards and the upcoming SMARTER Balanced Assessments.

She was encouraged to see "kids like hers" doing such high-demand tasks and was willing to try it in her class.

Even though all teachers agreed that modeling had great impact on their own practice as well as their colleagues, they all also agreed that teachers were still hesitant to step out of their comfort zones. Mrs. Manson stated, "I think they need to see lessons modeled. They need to see technology being used." Even with modeling, many teachers were still afraid to take risks. They did not want to deal with the inconvenience of pulling technology carts in and out of the storage rooms. Pertaining to inquiry, Mrs. Müller said,

> As far as the inquiry-based, I think . . . we need to help all of our teachers become comfortable in releasing control. I think that's a big thing. Teachers tend to be kind of control freaks, and I think releasing some of that control to our students, that's something we need to help our teachers see validity in and necessity in.

Mrs. Boykin, a middle school teacher, shared what she had been telling her colleagues who struggled with inquiry-based instruction:

> Well, the first thing you have to learn is that there are always students that will try to wait you out so that you will answer for them. So that's the first thing I had to learn, is don't just jump in there and give them the answer, wait a bit longer.

Facilitating and Impeding Factors to Effective Implementation

To explore the essence of teachers' experiences with the mandated changes in inquiry and technology, middle and high school teachers were asked to reflect on impediments they encountered as they strove to implement inquiry-based social studies and technology lessons.

As emotionally emphatic as the participants of this study were about factors that supported their implementation of inquiry and technology, their passion about things that got in the way of adhering to the mandated changes also evoked a strong emotional response. The findings of this study outline specific impeding factors that were articulated in the course of the interviews. All teachers who participated in this study reported several impeding factors to successful implementation: (a) teacher beliefs about the aptitude of their students, (b) inadequate hardware and software, (c) negative personal experiences with instructional technology that teachers brought to the new mandates, (d) negative impact on students' grades, (e) allotted time to implement the expected outcomes, (f) competing expectations, (g) student access to and skill of using technology for education, and (h) student resistance or inability to fully apply inquiry or Disciplinary Literacy. I will discuss these impeding factors in terms of high school teacher experience and middle school teacher experience. To reiterate, high school and middle school teachers experienced the aforementioned mandated changes differently in that middle school had greater latitude in the implementation of the mandates, while high school teachers' process was prescriptive. The former superintendent of Carver Public Schools implemented blended learning with rotation in all comprehensive high schools. Blended learning was a mandated district initiative that was instituted with little input from the teachers and the teachers union. As result, there were some public disagreements about the efficacy of CPS's blended learning model as a means of educating students.

Impeding factor 1: Teacher beliefs about students. Teacher beliefs about students have been explored in various forms in this study. I begin the discussion of

impeding factors with the premise that teachers' beliefs about students with whom they work drives their actions in the classroom.

Impeding factor 2: Inadequate hardware and software. Reflecting on why they and their colleagues were not using technology frequently in their daily practice, regardless of location or grade-level assignment, all participants reported frustration with hardware and inadequate technology. Mrs. Johnson, a high school teacher, reported,

> Many teachers in my building don't follow the technology component of the mandate. And the reason being is that when they're pulling out the computers, it's taking 20 minutes for them to warm up—and with an hour of instruction, that's a huge chunk of time for there to be no learning going on. But also, a lot of their computers don't work, for whatever reason they're just not working, so they've kind of given up.

Reflecting further, she added,

> Every once in a while they will pull them out and try to do something with them, but it's not been something that was as consistent as it was 2 years ago, when we did have the rotation. I have heard, "We're not doing blended anymore . . ." So I think they're a bit reluctant with the technology.

A technology tool that was being used by the teachers who had access to it was interactive whiteboards and digital projectors.

Impeding factor 3: Negative personal experiences with instructional technology—high school perspective. CPS mandated that all high school teachers teach social studies using a blended learning model involving one DL teacher and one

interventionist teacher. Those teachers share responsibility for a cohort of approximately 300 students. Because the change was done rapidly on such a large scale, many teachers were resentful of the process. District leaders in CPS later relaxed the expectations and allowed individual teachers to do blending in their classroom without students rotating between two teachers. Unfortunately, the majority of teachers saw the changed process as the end to blended learning.

To underscore her points about teachers' past experiences, Mrs. Woods reported of the teachers in her PLC, "I think that bad experiences have to be addressed for some of these teachers, and provide concrete solutions to real problems that they are facing." Building on Mrs. Woods' thoughts, Mrs. Johnson's reflections touched on the same idea in a slightly different way as she said,

> Every once in a while they [teachers] will pull them [computers] out and try to do something with them, but it's not been something that was as consistent as it was 2 years ago, when we did have the rotation. Um . . . I have heard, 'we're not doing blended anymore.

Mrs. Manson spoke of the teachers with whom she worked:

> The individuals I work with aren't technology certified. I think they don't mind using technology, I just don't think they want to take the time to teach every component. To have to teach all the different METS standards is overwhelming. It really does take a lot of time to teach the kids how to use something like Glogster or other new technology tools.

In her capacity as a DL coach, Mrs. Woods recognized that her colleagues were not using technology. But she believed that, despite computer issues, it was important to keep encouraging her colleagues to use technology in their instruction. She recalled helping a colleague who was frustrated because he had only 17 laptops to use for class of 38 students to organize learning stations where students were able work collaboratively on projects. Although middle school teachers' experience with technology could not be directly tied to being forced to incorporate technology via Moodle as it was in high school, teacher perceptions with the malfunctioning and inadequate technology was similar to that of high school. All teachers reported dealing with slow login time, laptop carts with 35 computers but only a handful that worked, and the inconvenience of having to transport them back and forth from a secure overnight storage room.

Impeding factor 4: Negative impact on students' grades. Mrs. Johnson recollected her experience with teaching inquiry through her role as a DL coach. Through the course of the interviews, 3 of the 7 participants mentioned a concern about keeping their failure rates low. I later learned that as part of district policy, teachers were under scrutiny to ensure that less than 35% of their students were failing any subject that they taught. To avoid being identified as teacher who "fails" too many students, DL coaches reported that some teachers in their buildings were teaching to the common assessments.

In addition to the fear of "failing" students, Mrs. Woods stated that teachers were reluctant to apply inquiry methods in their classrooms because they felt the pressure to adhere to the district-outlined pacing guide in the common syllabus. "I think the pacing is really bothering some people. They want to go into depth on some things, but they look at

that pacing, and they know they gotta keep moving on." Furthermore, it was noted by all teachers interviewed for this study that planning for instruction in an inquiry-driven way often took much longer than teaching in a non-inquiry way. Just as it took longer organize lessons, activities, and assessment tasks, it took more time to grade student products. As Mrs. Woods said, "It's too much grading, it is too much feedback, and it is too much everything." In summary, all teachers expressed concern that it was the perception of their colleagues that spending time on technology and inquiry would adversely affect student achievement as measured by grades.

Impeding factor 5: Time to learn and apply new knowledge. Among the other factors that have already been discussed, time was one of the factors over which teachers felt they had no control. For all participants, time played a major role in how the mandated changes were achieved. Time was discussed in terms of not having enough time to teach using inquiry-based techniques. As a middle school teacher, Mrs. Ross said,

> The timeline, as far as what we are supposed to teach, I think there might be, if we weren't tied to a specific pacing guide, we might have time to delve into more project-based learning, where we could do more inquiry-based, if the teachers weren't afraid of getting behind, um, as opposed to really focusing on skills and so on.

Mrs. Woods, a high school teacher and coach, echoed the concern about time in terms of pacing as well:

> I think it's just pacing. I think they would go deeper and take that inquiry process a lot farther, but once again, they look at that pacing and know that the time, the

> clock is ticking, and there's only so much time and so much material to get through.

The need to get through the content in order to meet the pacing surfaced as an obstacle to meeting student needs. Mrs. Woods saw it differently. To her, pacing should have not been as big an obstacle as her colleagues made it to be. She underscored her point by saying,

> I think they're [teachers] trying to meet the needs of the students at various levels. Once they [teachers] realize you have to push for that inquiry at different levels, for each student, I think they'll get it. But they just have try harder to meet the kids where they are, and still push high level inquiry and stay on pace.

Impeding factor 6: Competing expectations. Among other impeding factors that were commonly reported by all the participants was that they were expected to comply or implement too many initiatives from the district. Mrs. Laveran reflected on her experience with what she called competing expectations:

> I think teachers are really just overwhelmed, I do. I think they just have so much coming at them from all directions, between administrations, between the districts, between now the union and the debate about low pay for teachers. . . . I think that impedes what going on in the classroom.

Three of 7 teachers commented that the mentality of some their veteran colleagues was such that "this too shall pass" because they have seen many initiatives come and go.

Mrs. Ross's comments reflected those of Mrs. Laveran. In her reflections, she named the many components that were a part of their school improvement plan.

> You could think you're doing well, and then all of a sudden realize, "Oh gosh, I haven't done thinking maps in a week and a half, or close and critical reading. . . . I've got to see how I can get that in"—it should all be seamless, but there is just sometimes so many things that we need, are supposed to include in each lesson that time is a big hindrance.

Adding to her frustration with too many initiatives, she went on to name other issues, such as the testing schedule (MAP testing) that keeps teachers out of computer labs and limits access to the laptop carts.

Impeding factor 7: Student access and skill of using technology for education. Teacher experiences with mandated changes in technology were closely tied to how they supported student learning. It is important to remember that the core purpose of the mandating changes in teachers' daily practice was to build student skills in inquiry and technology in order to increase student achievement and engagement. During the data gathering process, a common theme emerged among all teachers interviewed. They highlighted the fact that students lacked access to technology beyond the school day. Consequently, students lacked the basic technological skills and knowledge needed to work in the way that they were being asked to work by their teachers. If the students had requisite knowledge and skills, and had adequate access to technology beyond the school day, teachers contended that students still lacked the ability to use technology as tool for education and not just for social networking. Mrs. Ross summed up teacher perceptions about students' technological skills by stating, "I would say, my students compared to maybe some other school districts that are more affluent, that have had computers, they

are lacking simple computer skills such as typing, and even basic knowledge of the Internet." She talked about her experience exposing her students to the iPad for the first time. The students were excited about the new devices and quickly picked up on the things she was teaching them. Even though she recognized that the socioeconomic status of the majority of her students played a role in their being tech savvy, she attributed the lack of skills to the district's inability to fund basic computer classes. "I worry about, when we have to take those assessments online." The only difference she said was the other schools have computer classes and the students are exposed to technology at school and at home.

As a follow-up to the question of student strengths and weaknesses as related to technology, the prevailing thought was the lack of skills by students as an impediment to teachers' use of technology in instruction. Conversely, teachers were asked to speak about the technological strengths that their students brought to learning. All 7 teachers interviewed reported a major strength that students had when it came to technology was their fearless attitude in the use of new technologies. To explain, Mrs. Johnson stated,

> Okay. So the strengths of our students are that they are not afraid to try different tools in technology. They'll get on there, they'll play around with it and figure it out, and most often they'll be better than we are with it. The weakness is—and this is what teachers need to build with these students—they don't necessarily know how that technology aligns with what they're learning. So oftentimes what's happening is, and this is with the teachers, too, the teachers really use the technology for technology's sake, not for the curriculum's sake.

She went on to say that teachers should have a specific purpose for why they are using tools such as Microsoft Office suite, Glogster, and others.

Likewise, high school teacher Mrs. Manson spoke about the fact that students, even though they may be able to access information via the web, need to be taught how to conduct proper research. "I don't know if they think they [students] always know how to do the research, what is a valid source, so I think, again, that's where some of that training comes in." Mrs. Manson was emphatic that when her assignments are well organized and her students are given proper scaffolds, they do well on tasks involving technology. In talking about her successes, she cautioned that even though students are more engaged with technology-rich lessons and activities, the teacher must be intentional in ensuring that he or she varies how the students experience the content. Her classroom practice was congruent with her remarks. Another teacher, Mrs. Ross was intentional in building inquiry and technology skills by designing projects that facilitated students' success. The task in which the students were researching countries in the European Union was designed in such a way that the students were self-driven and monitored their own progress against a clearly established rubric or criteria. She explained:

> This project [European Union Country Travel Brochure] was a good one, because they were able to find out some answers to their countries on their own, without maybe failing in front of a group; they all had individual countries, so they weren't measuring themselves to, you know, against other students, the right or wrong answer, because all their questions were different. But I do think they're afraid to try.

All teachers remarked on the importance of keeping "things" interesting for students. To explain, Mrs. Manson stated,

> I think they're [students] initially excited [about using technology], but then I think it becomes repetitive to say that they . . . but I think they like getting away from [drill and kill] . . . I think they like the idea of working on a desktop, they often listen to music, and then when they're done with their assignment, they can go on Facebook or something. So there's the reward, the incentive to get the work done, because I think they are allowed to use some of those media sites if they get their work done.

Mrs. Müller agreed, "Yeah, they [students] get excited when they see the laptops come out, but the key is to change it up a bit, keep it fresh."

Impeding factor 8: Student skills or lack thereof in inquiry. In reflecting about student strengths/weaknesses in fully engaging in an inquiry-based or technology-integrated lessons, all participants of this study reported that their students were not ready to learn in an inquiry way. All teachers remarked about students' deficiencies in inquiry techniques and educational technology usage. For example, Mrs. Ross said,

> As far as inquiry-based education, our students get very frustrated, when they're worried about getting the wrong answer. . . . I can think of quite a few students that are hesitant to even try, because they are worried about getting the wrong answer, even though we have tried to talk to them about, you know, we're all learning here.

Another participating teacher thought it was that teachers often are not prepared or willing to do the work of finding appropriately leveled text that addresses similar content. Despite the lack of skills, teachers were hopeful that as the result of district mandates in inquiry and technology, they began seeing change in students' inquiry skills. All participants reported that, for a long time in CPS, students endured teacher-centered classrooms. However, as a result of these mandates, as the classes began to become more student-centered, "the responsibility was placed back on our kids."

All teachers who were interviewed for this study talked about students' inability to use the Internet and other technology to conduct research. They intertwined the students' use of inquiry process and technological tools to accomplish tasks, specifically, the ability to discern which information is important to include in their projects or tasks at hand. As a middle school teacher, Mrs. Ross stated,

> There is so much information now in the world, and of course the Internet has just opened up even more, um, that, I don't think the human brain can retain all of those facts. Knowing how to effectively research and find those answers within a half-hour is what these students need to know, not what they can memorize. . . . Knowing how to use the skills and extracting that information out from something that they're reading right there, and making those inferences is key.

Mrs. Johnson, a high school teacher, did not see inquiry and technology as exclusive. In her classroom with her students, she approached the two mandated changes simultaneously. She explained,

> So inquiry would be the students kind of researching things on their own. So in that case, the weakness for our students is how to search. They don't necessarily know what good platforms to do research off of are and what bad platforms are. We still get students citing Wikis, Yahoo search engines, Google search engine, and not really getting beyond that information.

Mrs. Manson, who was also a high school teacher, also combined inquiry and the use of technology. She saw her students using inquiry and technology in a superficial way. She noted, as a coach, the only depth that she saw in the use of technology in her building came when colleagues were using the resources that she organized for them.

> I think the part that is limited is that there is very little inquiry—it's used through technology; they do assignments, they create stuff, but it's usually exactly what the teachers have handed out and they're just cutting and pasting it, essentially, onto a PowerPoint.

Mrs. Woods also saw inquiry and technology as "hand and glove." She stated that teachers who were working hard to separate the two mandates (technology and inquiry) were making it harder than it should have been to implement the expectations. In talking about her students and their skills for inquiry and technology, she placed the blame on teachers. She attributed the lack of skills that students displayed on the teachers who did not teach them to go beyond the basics in the lower grades. She stated, "They're [students] just like adults; they become complacent in their mode of operation. For example, they would much rather just go back to a normal PowerPoint. That is what they are comfortable with."

Even though teachers recognized that students lacked skills when it came to technology and inquiry, they offered examples of what they were doing in their classrooms to foster the necessary skills in their students. For example, three high school teachers were collaborating to create a "flipped classroom." In a flipped classroom, the teacher records a 5-minute or less mini-lecture to be consumed by the student prior to class. Class time is then for clarifying misconceptions. Mrs. Johnson suggested that others do what she was attempting in her classroom. "I just keep introducing them to the technology, kind of showing them that "Hey, you're doing this assignment; you could do this online using this tool." Mrs. Ross noticed that her students were much more excited about using technology. To capitalize on this excitement, she created tasks that were more inquiry-based and used technology. "I do think they're much more engaged, much more motivated, than they would be if it was just paper and pencil and had to do research from a handout, or even just the book."

> Mrs. Müller was hopeful in her reflections about students' abilities. She said,
>
> So it's been a mind-shift, not only for our adults, it's also been a big mind-shift and a change for our students. Ah, there was a lot of groaning and moaning and complaining, and "this is too hard" at the beginning from our kids, to where now I see in some of our classrooms they're getting more used to it, where they, themselves are starting to see the process, and knowing what to do, so it's starting to flow much better.

In regard to inquiry, she said, "I'm hearing really good student-led discussions, small group, whole class, partner, where they are looking at information and, you know, using

evidence; comparing and contrasting; really seeing relationships between cause and effect." She connected this to the work of IFL in as it pertains to Socializing Intelligence and the use of Accountable Talk. Despite the impeding factors enumerated by the teachers, overall, all were confident and pointed to evidence that technology and inquiry were being used within Carver Public Schools both by teachers and students.

Summary/Concluding Thoughts

This study has shown that in Carver Public Schools there was policy incoherence within the district as it translated federal and state policy into changes in teacher beliefs, knowledge, and practice. Although the teachers who participated in this study reported limited coherence by seeing the connection between the mandated state standards and pedagogical expectations using inquiry and technology differently in their daily instruction, the experiences of their colleagues suggest otherwise. Several factors influenced the teachers' ability and willingness to implement the mandated changes. Teacher beliefs and attitudes toward the mandate changes, experience with technology in their teacher preparation, the kind of support received while attempting to implement the expected behavioral outcomes, opportunities for both teachers and students to learn new skills and practice those skills, and time to reflect on how the lesson went with colleagues, mediated the likelihood of the teachers implementing the mandated changes in technology and inquiry.

It was evident that, even though the teachers were able to identify the coherence with the district policy and the mandated changes, there were issues that hindered successful implementation. Some of the issues identified were the Haves and Have-Nots

when it came to having access to technology, students' inability to use technology for educational purposes, and students' inexperience to work using inquiry methods.

Additionally, the participants of this study reported seeing changes in their own practice and that of their colleagues pertaining to inquiry-based instruction and technology integration lessons as a result of the mandated changes. Even though the changes were not uniformly visible in all teachers, or across all schools, teachers reported seeing more use of inquiry and technology. Specifically, the surge in the changed practice was greatly influenced by teachers being given opportunities to see or hear of successful practice in their colleagues' classrooms with students whose demographics reflect their own.

The fundamental question asked by this study was, "Does mandating change at the classroom level in inquiry and technology really work in changing teacher beliefs, knowledge, and practice?" This study found that mandating changes does change teacher practice as teachers build their knowledge and, at some level, it impacts their beliefs when experiencing some level of success. It was also evident that teachers worked hard to comply with the mandated changes in their daily practice. However, at certain times, all their efforts were overshadowed by a deluge of seemingly conflicting initiatives or policies.

This study has implications for parents, students, teachers, principals and other school administrators (i.e., curriculum coordinators), and legislators at the state and federal levels. More should be understood about how teachers experience mandated changes directed at improving student achievement through changing their daily practice.

After all, as stated in various MDE curriculum documents, the primary purpose of social studies education is to produce citizenry that is well educated and prepared to face the challenges of living in an increasingly interconnected world.

In Chapter V, I discuss how this study connects to the current body of literature as well as offers implications for other school districts that may aspire to mandate pedagogical changes in inquiry and technology. In light of the Common Core State Standards (CCSS) and other state mandates calling for increased use of technology and complex problem solving via inquiry processes, it is a pertinent time to pay attention to policy interpretation and implementation.

CHAPTER V

DISCUSSION

This Study in Review

Using the Constructivist Grounded Theory Phenomenological Approach (Creswell, 2002, 2013; Fendt & Sachs, 2008), I set out to investigate how middle and high school social studies teachers in an urban school district known as Carver Public Schools experienced mandated pedagogical changes in how they taught using inquiry-based instruction and technology-integrated lessons. Seven teachers participated in this study. Three teachers taught high school and four taught middle school. I became interested in learning more about how these experiences were mitigated or affected by policy coherence or incoherence within a district as they translate federal and state policy (i.e., social studies and technology standards) into mandated changes at the classroom level. Furthermore, I wondered if mandating changes at the classroom level really work in changing teacher beliefs, knowledge, and practice. Specifically, the purpose of this study was to discover, describe, and understand the following questions:

1. Is there policy coherence within a district as they translate federal and state policy into changes in teacher beliefs, knowledge and practice?"
2. In terms of knowledge, beliefs, and practices, how do teachers experience district-mandated changes in both technology and inquiry-based instruction in their daily practice?

a. How do individual teachers experience mandated changes?
b. Does mandating change at the classroom level in inquiry and technology really work in changing teacher beliefs, knowledge, and practice?

To answer these questions, I reviewed the pertinent body of literature dealing with educational policy in K-12 schools, technology integration, and inquiry-based instruction. The literature revealed that educational policy is valued with ever-shifting rules. Depending on one's political ideology and beliefs about how education can be used as a means through which complex social problems can be addressed, federal and state legislators have historically pressed K-12 institutions to change how students are taught in order to achieve the desired outcomes. Specifically, legislation such as Title II, Part D of the No Child Left Behind Act (NCLB) and Race to the Top have mandated curricular and technology standards. To explain, the curricular standards include inquiry in that they ask students to investigate and solve complex problems. In regard to technology, the legislation requires states and districts to have a current and approved educational technology plan that outlines how the funds received from the federal government will be used (Broadening Education through Technology, Section 2414, Local Application). As it applies to inquiry-based instructions, Michigan Department of Education (MDE) states:

> Effective social studies instruction and assessments incorporates methods of inquiry, involves public discourse and decision making, and provides opportunity for citizen involvement. Each year, students should receive instruction that allows them to think and act like historians, geographers, political scientists and economists. (Grades K-8 Social Studies Content Expectations, MDE, 2007)

Given the fervent cries for additional research addressing policy sense making at the classroom level, I set out to address following gaps in literature: "Few studies have investigated sense making in terms of affective dimension of implementation process. Relations between district policymakers' and teachers' values and emotions and their sense-making are not well understood" (Hargreaves, 1998, cited in Spillane, 2004, p. 169). Additionally, Spillane (2006) called for a deeper exploration of the interplay between policy, teachers, and students. In his estimation, scholars often focus too narrowly on the connection between school leaders' work and teachers' classroom work.

Leadership practices, however, might connect with teaching and learning through a variety of different activities that are linked directly to students, teachers, materials, or some combination of the three. A similar call for further research was offered by Louis et al. (2005), who stated,

> We also hope that our study will result in deeper investigations of the role of districts (and other significant actors operating between the state and schools) in mediating among policies adopted by the state and implementation within schools. Sense making and district mediation are important perspectives that deserve further research.

Furthermore, Hew and Brush (2007) called for research that examines specific barriers of technology integration in greater detail.

Guided by overwhelming evidence in literature that school districts spend large sums of money from their budget annually in these two areas (Grosskopft, Hayes, Taylor, & Webber, 2001; R. Leneway, personal communication, 2011; Regional Education

Laboratory, 2008; U.S. Congress Office of Technology, 1995, cited in Fabry & Higgs, 1997), I was compelled to explore literature dealing with the impact that technology and inquiry may have on student achievement. Additionally, I pursued the research that chronicled how districts respond to external pressure from federal and state policy. The district response was explored through the lens of how change takes place within schools focusing on leadership at the central office level (Abrahamson, 2004; Elmore, 2004; Fullan, 2006; Schachter, 2005; Spillane, 2006) and the building level (i.e., principals and teachers) (Covey, 1990; U.S. Congressional Proceeding on *A Nation at Risk*, 1972, p. 56).

Because this study aimed to examine the lived experience of teachers as it pertains to mandated changes and how the mandated innovations permeated teachers' beliefs, knowledge, and practices, Vygotsky's (1978) social constructivist and Rogers' (1995) diffusion theories were used. Additionally, Koehler and Mishra's (2005) and Harris and Hofer's (2009) Technology Pedagogical Content Knowledge (TPCK) model of technology integration were used.

Multiple methods of data collection were used in this phenomenology research (e.g., interviews, observations, documents). The interview protocol was designed to draw out how teachers interpreted their experiences of the mandated pedagogical changes through the lens of (a) beliefs regarding instructional technology and its use in the classroom, (b) using inquiry as a teaching approach, (c) professional development, (d) administrative support, (e) collaboration with colleagues, (f) resources for inquiry-based instruction and technology, (g) facilitating or impeding factors, and (h) change in

instructional practices. The interviews were transcribed, analyzed, and grouped according to the eight themes above.

Changing classroom practice through mandates is a complex, multifaceted process that involves teacher beliefs, prior personal experiences, attitudes, and support mechanisms through formal and informal networks, readiness and abilities brought to bear on the part of the students, and accountability measures for all stakeholders, supported by policy instruments such as curriculum, assessments, and resources (Prawat, 1992). Schools have turned to known best practices, such as inquiry and tools such as technology, to help students experience content more richly. Since teachers interact with students on a daily basis, federal, state, and district policymakers interpret policy and craft mandates aimed at changing teacher practice.

In this final chapter, it is important that key findings are summarized and recommendations are made to all levels of policymakers, since federal and state policies are being translated into classroom practice. The recommendations made in this study are especially important for stakeholders such as curriculum coordinators/supervisors, Intermediate School Districts (ISDs), and other administrators who have direct influence over how teachers experience mandated changes within their organizations, especially changes dealing with technology and inquiry.

Interpretation of Findings

This study is an important addition to the literature addressing educational policy and mandated changes pedagogical changes, because it focused on domains (inquiry-based instruction and technology-integrated lessons in the area of social studies) and

teachers (middle and high school) that have been the subject of relatively little research pertaining to the lived experiences of teachers in an school district as they work to meet the expectations of mandated changes aimed at school reform. The findings of this study are addressed in the following themes: teacher preparation programs, teacher belief about instructional technology and its use in the classroom, the benefits of inquiry-based instruction, the role of high-quality professional development, administrative support (i.e., principal/teacher leadership and accountability, resources allocation), and facilitating and impeding factors like the those identified by Rogers' (2000) model. Rogers' model identified six main barriers: (a) stakeholder attitudes and perceptions, (b) stakeholder development, (c) availability and accessibility of technology, (d) technical support, (e) funding, and (f) time. It should be noted that Rogers' six barriers were discussed in terms of how teachers experienced these barriers through the lens of their students and four competing or conflicting initiatives. The teachers in CPS expressed concern that the district's focus on technology-integrated lessons, inquiry-based learning, expected adherence to a common syllabus, and administration of common assessments were initiatives that competed for teachers' attention.

Teacher Preparation Programs

Through the interview protocol that asked participants to share background information about the number of years of service and their teacher preparation or preservice experience with inquiry-based learning and technology integration, significant insights immediately emerged. At the time of this study, 5 of the 7 participants reported having had little to no experience with inquiry-based instruction in their teacher

preparation programs. Most what they used in their daily instruction was learned on the job or through self-sought professional development experiences. Mrs. Manson's recollection of her undergraduate experience sums it up well:

> In my undergrad . . . that seemed more of the basics. It was getting the foundation set, but the depth of which a lot of these components address I think has been, was just the foundation; I had to do a lot more outside, to build a true understanding and knowing how to really apply it [inquiry-based strategies].

The exceptions to the aforementioned trend were two teachers, Mrs. Boykin and Mrs. Johnson, who reported having been expected by their professors to employ inquiry-based strategies in their practicum. Mrs. Boykin's remark encapsulates their independent experience when she said, "Our professors concentrated on project-based methods; active engagement; using a variety of maps and other documents. The emphasis was on developing a lesson, rather than relying on a printed, whatever the publisher tells you to do."

Participants also reported having limited preteaching experience with technology-integrated lessons. Depending on the number of years that the teacher had been teaching (which ranged from 9 to 23 years) and whether they pursued a master's degree, experience with technology ranged from experiencing teacher/professor-led presentations of project-based learning tasks in which they were expected to create technology-rich activities for their students, to experiencing professor-led lectures through PowerPoints and films. That range of experiences is represented by the following comments. Recalling the lack of experience with educational technology, Mrs. Laveran said, "Mostly what I

know about technology I just learned through experimenting on my own. Right now, if I have technology questions, I ask our tech person, and she is very good about explaining things." Her statement was representative of 3 of the 7 teachers who took part in this study. The remaining 4 teacher participants experienced educational technology during their preservice years in more applicable ways. Mrs. Johnson stated,

> So one of my goals in teaching, when you write your philosophy of teaching, was that I am a facilitator of learning, and the kids are really the ones who are investigating and using, you know, technology if need be, to kind of find solutions to problems or what have you. So when I went into teaching I really thought I would be using a lot of that technology, only to find out that there wasn't technology, but I still used inquiry in the classroom. And that's, I've always come at education from a, not project-based, but more of a problem-based method of teaching, and doing that for about 12 years.

It must be noted that mentioning the participants' experiences in teacher preparation here is not intended to be an indictment on the work of teacher education. It is to understand what the participants of this study brought with them as they were being expected to implement mandated pedagogical changes in inquiry and technology. This study's finding around teacher preparedness is consistent with the findings in the literature (Byrum & Cashman, 1993, cited in Wild, 1995; Callison, 2004; Chen, 2008; Levin & Arafeh, 2003; Vannatta & Beyerbach, 2000) that found teacher preparation programs may need improvement in how they are preparing preservice teachers in technology and inquiry.

Mandated Pedagogical Changes and Teacher Beliefs

The second finding of this study shows that what the teacher believes about instructional technology and its use in the classroom and the benefits of inquiry-based instructional practices was important in how they experienced the mandated pedagogical changes. "Beliefs can be inferred from what people say and do (Pajares, 1992), and thus can give insight into the reasons teachers act the way they do (Dwyer, Ringstaff, & Sandholtz, 1991).

All middle school teachers who took a part in this study believed that it was important not only to use technology as a tool for instruction, but it was equally important to teach the students the skills needed to be consumers as well as producers of content involving technology. This is demonstrated by the comments by Mrs. Ross:

> You know, we went over what a URL is, when we first introduced this research project. We went over the word database, what were credible sources, so we were able to embed some of those Common Core skills into our pre-lesson for this project, so that they're starting to learn effective researching skills. Which is so important because, you know, there is no certified library media specialist in the schools anymore because of budget cuts; there is no computer class in the schools.

Mrs. Müller stated,

> I think it's the responsibility of everyone, you know, I mean we can't get away from the fact that we are a much more digital society than we've ever been before, and a great deal of our children's communication is via technology. I do think it's important that they [students] see positive exposure to technology, not just

> through texting or Facebook, or other social media sites, but see representations of academic technology, in homes as well as at school.

Similarly, the three high school teachers who participated in this study believed in the power and necessity of technology-rich instruction. Mrs. Johnson stated,

> I think it [teacher belief] makes a huge impact. . . . I think if a teacher comes in and they do not really want to use technology, and they show kind of that negativity towards it, the kids take it as they're not going to learn anything from it either. It kind of goes with how the teacher feels about it and how much passion they're putting in with it, I think is the thing that really keeps the kids learning.

As demonstrated here, not only did the teachers in this study embrace technology, they sought to learn more about it. The findings of this study confirm and extend the findings of Cuban (1996) and Noble (1996, 2004) that described teachers as gatekeepers because they decided what technologies may enter the classroom and whether or how they could be used. Adding to the perspectives offered by the participants, their reports regarding the experiences of their colleagues were also confirmed in that the identified barriers also impacted their beliefs about technology. It also offers a differing perspective from that of Eteokleous (2008), MacMillan et al. (1997), and Lei (2009), who characterized teachers as reluctant and unwilling to use new technologies. Furthermore, teachers in this study contradict the findings of Newhouse (2001, cited in Bodur et al., 2000), whose study of Australian secondary schools found that the majority of teachers believed that computers would not lead to better understanding or faster learning.

Even though they experienced little inquiry-based instruction in their preservice preparation, the 7 teachers who participated in this study believed that inquiry-based instruction was a powerful mechanism in helping students learn the intended concepts. Reflecting on their experiences in the context of PLCs, participating teachers reported the variances in personal experiences with inquiry-based instruction as well among the teachers with whom they worked. For example, Mrs. Johnson, a high school teacher, saw herself "not a sage on stage" but as "a facilitator of learning." Mrs. Manson reported that inquiry based-instruction pushed her students to deeper learning by allowing them to problem solve. However, she recounted her experiences with others teachers in her PLC who were afraid to let students struggle and figure things out. "I think that release of time and effort to kids is a struggle . . . there is a fear that students will not get it on time." Mrs. Leveran stated, "As far as inquiry, I teach that way all the time. I think that's just the teaching best practices." Mrs. Müller valued the use of inquiry-based instruction as it "apprenticed the students as historians." Mrs. Boykin, a middle school teacher, reported her use of inquiry: "I like inquiry because it makes the student think, so that they're not such a passive learner." Literature about teacher beliefs (Cantrell & Callaway, 2008; Hall, 2005; Theriot & Tice, 2009) suggests that what teachers know and believe can change over time. Whether focusing on technology-integrated lessons or inquiry-based instruction, the findings of this study are consistent with the findings of Bandura (1994), Lent, Brown, and Hackett (1994), and Schunk and Pajares (2005), which speak about the positive relationship between beliefs, self-efficacy, and different motivational and behavioral outcomes in education. This study answers the call by Cochran-Smith and

Fries (2005) on the need for research studies that "examine and untangle" (p. 100) the relationship between teachers' beliefs and their teaching practices. The participants of this study confirmed that the manner in which teachers approached the mandated changes impacted how they planned, enacted, and reflected on a particular lesson. Also, their underlying view of the students and their ability to learn also impacted the tasks and interaction in the classroom.

The Integral Role of High Quality Professional Development

The third finding of this study may provide valuable information to districts that may mandate changes in inquiry and technology. It is hoped that they will be prompted to offer professional development experiences that create cognitive dissonance (Kaser et al., 2002) for teachers not only to challenge their beliefs about inquiry-based instruction and technology-integrated lessons, but also to offer vivid examples of how the use of inquiry and technology has increased achievement in classrooms like theirs. Participants of his study highlighted how indispensable the professional development that they received in inquiry-based instruction and technology integration was to helping them meet the expected pedagogical changes in inquiry and technology. All of the participants reported having received much support inquiry through job-embedded professional development events through Carver Public Schools (CPS). Specifically, all teachers received PD through CPS's partnership with the Institute for Learning (IFL), an educational research think tank at the University of Pittsburgh. The focus of the PD received through the IFL was a multiphase process that began by forcing teachers to explore their beliefs about teaching and learning (i.e., Effort-Based Learning). They then provided layered modules

to help teachers reflect on their daily practice by exploring the specific Principles of Learning (e.g., Accountable Talk, Organizing for Effort, etc.). All the PD was anchored in Disciplinary Literacy (DL).

Teachers reported that having a chance to experience inquiry-based lessons, deconstructing those lessons, and talking about them with a colleague really helped them make connections as to how they would use a similar practice in their classrooms. Mrs. Müller's comment is representative of the teachers who participated in this study:

> With the inquiry-based instruction, I would say a majority of that support . . . has come from our training and our coaches' PLCs, and things of that nature . . . has been a great support in helping broaden my horizon and in taking that back into my own classroom. And then this year, in taking it back to my building for my teachers, and even utilizing it in the modeling phases and the coaching phases, as well.

Mrs. Johnson said, "IFL is very much centered on a problem-based method, through inquiry and the DL model." Having professional development in inquiry readily available served to facilitated adherence to the mandated pedagogical changes.

Regarding technology-integrated lessons, there was a great range of experiences among the teacher participants. Overall, teachers reported limited access to professional development that really helped develop and deliver lessons that were technology-rich. The majority of the PD in technology was self-sought through venues such as conferences sponsored by professional associations and the Intermediate School District (ISD). As Mrs. Woods reported,

> Well, I know I personally sought out conferences that supported the technology usage directive early on, opened my eyes to a lot of the Moodle platform's capabilities, and studied other district initiatives like Gaggle, where we worked with our Mr. Bradley.

Although these opportunities were available to all teachers in CPS, participating teachers reported that not all their colleagues were self-efficacious in taking advantage of these PD opportunities. Within the Carver Public Schools, the support received depended on the building in which the teacher was based. Those who were based in School Improvement Grant (SIG) schools received more technology professional development than those who were not. For example, teachers in one SIG school reported having "Wired Wednesday," a time when teachers explored instructional technology resources such as iPad apps, Smart Boards, and Nooks.

Mandated Change and Administrative Support

Fourth, the findings of this study highlight the importance of administrative support in facilitating adherence to district-mandated pedagogical changes in inquiry-based instruction and technology-integrated lessons. Teachers reported a high level of administrative support as they strove to incorporate inquiry and technology in their daily practice. The support was expressed in terms of time allocation for PLCs to facilitate collegial collaboration, provision of technology tools and inquiry-based teaching materials, and teachers being empowered to lead in various capacities. Furthermore, teachers reported that principal accountability was a form of support, as some colleagues would not have followed the mandated pedagogical changes without administrative

pressure. The experience reported by teachers in this study is consistent with Davis, Darling-Hammond, LaPointe, and Meyerson (2005), who postulate,

> In the school reform movement, the vital role of school leadership and particularly the role of the school principal has garnered increasing attention. The evidence suggests that school leadership matters and has a strong effect on creating a school culture that promotes powerful teaching and learning for all students. (p. 3)

The Role of High Quality Professional Development

It has been established in literature that professional development is essential in bringing about change in teaching and learning. Educators have argued that in order to change teacher beliefs, knowledge, and daily practice, policymakers need to provide teachers professional development experiences that mirror how they are expected to teach. Additionally, teachers need be given multiple opportunities to practice those modeled experiences in the context of their own classrooms (Borko & Putnam, 1995; Darling-Hammond & Ball, 1998; Gess-Newsome, Southerland, Johnston, & Woodbury, 2003; Loucks-Horsely & Matsumoto, 1999; Ertmer & Ottenbreit-Leftwich, 2010; Shulman, 1987; Smith, 2000). Furthermore, in some aspects, the experiences of the teachers in this study showed that CPS as a district began to transform how professional development was offered. It appeared that they were applying research based on a transformative approach to PD (Kaser et al., 2002). Transformation focuses on designing adult learning experiences that challenge participants' current thinking and often startle them into new beliefs. It also employs an additive learning approach to PD that is

appropriate for developing new skills (Kaser et al., 2002; Thompson & Zeuli, 1999). It is hoped the findings of this study provide additional insight to district policymaking perspective and a deepened knowledge about the kind of professional development support that is needed in order to facilitate deep change in beliefs, knowledge, and practice.

Time for Teacher Learning: Professional Learning Communities (PLCs)

Among the many resources that a principal can provide, the first resource is allocating time for teachers to meet in Professional Learning Communities (PLCs). Six of the teachers who participated in this study received remuneration for taking part in PLCs. As Mrs. Ross reported,

> Yes. PLCs are paid, and so I think if it wasn't, if we weren't paid, it would be more informal, hallway chatter, which, you know, we always seem to do, anyways, after school on Fridays. But this is a formal thing that we are required to do under the SIG contract.

One of the middle school teachers reported that, because she was not based in a SIG school, the PLC time was provided but unpaid. Even though unpaid, teachers in her building still used the time to discuss teaching and learning. She expressed her appreciation of this time:

> No. There is no extra pay. The first Monday of the month we usually meet as a social studies group here in the building, and we work on projects that we're trying to develop or implement. Um . . . is it once a month we have a half-day. We go over to Staff Development, and it's during the school day, so the district

> pays for the substitute teacher for half a day. I really learn a lot from my colleagues. And especially some of the younger colleagues, because quite often they're more savvy with using technology, and it's like, oh, I could do that; I can do a lot of things, if somebody will just show me, and sometimes that's all I need.

The quote by Mrs. Boykin is consistent with findings in studies that place teacher leaders squarely at the center of transformation. Brown and Campione (1990, 2002), Brown et al. (1989), Zhao and Cziko (2001, cited in Ertmer, 2005), and Spillane (2004) came to the conclusion that "Groups interaction can aid sense-making because they bring to surface insight and perspectives that otherwise might not be made visible to the group" (Spillane, 2004). Mrs. Ross said of her time in PLCs with colleagues, "We talk with each other; I especially like the PLCs where we get together with other 7th grade teachers in the district and get to plan, you know, they have ideas."

Given the unprecedented pressure to achieve specific standards, an important feature of this study was the use of qualitative questioning techniques that caused to surface the teachers' experiences and their connection to Grade Level Content Expectations (GLCEs) and High School Course Content Expectations (HSCEs) for social studies and the National Technology Standards (NETS). All teachers in this study reported that, as they collaborated with colleagues through both formal and informal PLCs, conversations were centered on helping students meet the standards. The teachers worked on improving student achievement on current standards and the newly adopted Common Core State Standards. Several teachers remarked about the "laser-like" focus on standards that their PLC meetings had. This increased scrutiny regarding standards

stemmed from the sense that not all social studies teachers truly knew the expectations. Mrs. Woods said,

> I feel as though that the social studies teachers, and all teachers, they don't know the basics of those NET standards. So in the process, because we've put them out there, we really haven't supported them unless you've really searched them out.

Building on this comment, Mrs. Manson stated,

> Teachers don't necessarily set the standards, but how they interpret them and apply them to the kids reaching them varies, and so if their [teachers'] approach is limiting, and they try to lead or tell the kids how to do it and what to think, I don't think the inquiry is there.

The reported experiences are consistent with McLaughlin and Talbert's (2006) finding that

> teachers improve student learning by working together on instruction at the intersection of particular students and particular subject content. The knowledge they develop includes how to represent concepts to students, how to detect learner misunderstandings and anticipate them, how to provide feedback that guides students' learning of particular concepts, and how to connect . . . students' experiences and aspirations.

Overall, teachers in this study confirmed what has been well documented in literature, that there is great personal and collective benefit to teachers meeting in high-functioning PLCs that are focused on teaching the standards and gauging how students are learning (Anderson, Rolheiser, & Gordon, 1998, cited in Volante, 2006; Barth, 2006; Kruse,

Louis, & Bryk, 1994; DuFour, 1987, cited in CCSSO, 1997; Dodd, 1995; Elmore, 2004; Harris & Jones, 2010; Hord, 2009; Hord & Sommers, 2008; Renyi, 1998; Sparks & Hirsh, 2000).

Provision of Technology Tools and Inquiry-Based Teaching Materials

An additional supporting role played by administrators as outlined in the findings of this study is that principals provided teachers with curriculum materials to support inquiry-based instruction and technology. All high school teacher participants reported that they had access to resources with which to plan, enact, and reflect on inquiry-based lessons. Mrs. Manson said,

> I know in our standards we have it where the kids have to do inquiry and do research and look at a variety of sources, and look at a problem and see how to solve them using outside the district resources, outside of their textbook.

As Mrs. Müller put it,

> With social studies, I feel it's quite easy, because we do so much with various types of sources. We can do so much beyond the textbook, whether it's primary photos, whether it's analyzing music, political cartoons, and primary sources of all sorts of types.

Even though teachers reported having access to resources that facilitated inquiry-based instruction, the teachers who were based in the SIG schools had access to additional resources such as leveled readers, project-based learning binders, and document-based questions binders.

Although access to technology varied across Carver Public Schools both by middle or high school and by being a SIG or non-SIG school, teachers credited principals for allocating resources with which to meet the mandated pedagogical changes in technology-integrated lessons. High school and middle school teachers experienced mandated changes in technology differently. High school teachers were expected to teach in a blended environment, where they facilitated instruction in a face-to-face format while alternating to a web-based content via the Moodle learning management system. This study showed that high school teachers had access to laptop carts. However, the computers were slow to boot-up, often broken, or often "commandeered for assessments." Some of the teachers' frustrations were evidenced by Mrs. Manson: "The school provides technology, and in comes the frustration of damaged technology, missing technology." Additionally, she summed up the feelings of her colleagues:

> The amount of work that goes to organize and facilitate the use of technology, and having the kids use it, and how they guide the kids through the activity, how they organize the oversight of the technology, is, I think sometimes they feel it comes across as too much work, and don't do it.

The findings in this study corroborate Henry and Clements (1999), who found that teachers often abandoned the use of technology if they saw it as a hindrance.

Middle school teachers experienced mandated changes in technology with greater freedom. Consequently, teachers reported bringing technology into their daily instruction when they could. It was evidenced in this study that middle school teachers were assigned a laptop which they connected to a Smart Board to facilitate teacher-led

presentations. The goal of the mandated pedagogical change in technology-integrated lessons was to move teachers away from being merely presenters of information. It was meant to empower teachers to facilitate instruction so that students are more than just passive participants to whom technology was being done, but rather to engage them as producers of products using technology tools. A startling finding was that within CPS, even though the teachers were expected to adhere to the policy of changed daily practice through inquiry and technology, there existed a phenomenon that teachers referred to as the "have and have-nots" when it came to access to technology; this was more evident in middle schools. Teachers reported this phenomenon existing in two tiers: (a) non-SIG vs. SIG schools, and (b) the SIG schools with just Smart Boards and laptop carts, and the SIG schools with additional technology (i.e., hardware such as Kindles, iPads, Nooks, and clickers). An example of tier one disparity was explained by Mrs. Müller:

> I think across the district there is a vast difference between who has access and who doesn't, but also, what we have access to . . . we have some buildings with iPads and tablets; we have some buildings that have very old laptop carts . . . with no iPads, and no tablets. So, although we have technology to use in our district, we don't have a consistent . . . I don't see that there's consistency . . . because the buildings that have the SIG grant, and even within the buildings that have SIG grants, a couple of those buildings were able to get the iPads and the tablets and a couple were not. So, we are a technological society and it's important that all our kids have the same technology.

Tier two disparity was expressed in terms of principal choice in allocating funds for technology purchases. Three of the four teachers who were interviewed and observed for this study reported that in their building, they had so much technology that they "didn't know what to with all of it." In contrast, other SIG school principals chose to spend the grant funds on other things. As Mrs. Laveran said, "There are principals who are sitting on millions of dollars." Whether fact or speculation, teachers believed that spending money on technology depended on the principals, as they were the ones who determined how the grant funds were used in their buildings.

Principal/Teacher Leadership and Accountability

In terms of teacher leadership and principal and collective accountability, 5 of the 7 teacher participants in the study played a duel role in CPS. The additional role of teachers in this study was that they were considered master teachers who were designated as Disciplinary Literacy (DL) coaches. Among the numerous tasks that DL coaches performed in CPS, their primary functions were to facilitate Professional Learning Communities and to model instructional best practices through the Plan, Enact, and Reflect cycle of Content Focused Coaching (CFC).

Through the CFC process, these 5 teachers were expected to help their colleagues implement the mandated pedagogical changes through inquiry-based instruction and technology-integrated lessons. Two teachers who were not DL coaches reported having benefited from having a colleague with whom they worked closely. The process of CFC was as follows: The teacher and coach planned a lesson together; the coach modeled the lesson during the first period while the collaborating teacher observed and took notes (see

Figure 3). Next, the observing teacher taught the same lesson while the coach observed and took notes. At the end of the day or during the preparation hour, the collaborating teacher and the DL coach reflected on the lesson though coaching conversation. Mrs. Boykin, one of the participating middle school teachers in this study, taught at a non-SIG school and did not have a DL coach in her building. However, she still elicited coaching support from Mrs. Laveran and Mrs. Müller, who were assigned to SIG schools. This study makes a contribution to the existing body of literature in that it supports earlier studies (Anderson, Snyder, & Bahner, 1993; Brand, 1998; Costa & Garmston, 1998; Knight, 2007; West & Staub, 2003) that highlight the importance of modeling as a critical component in changing teacher practice. This study found that, overall, middle school teachers in CPS were more receptive to peer coaching than high school teachers.

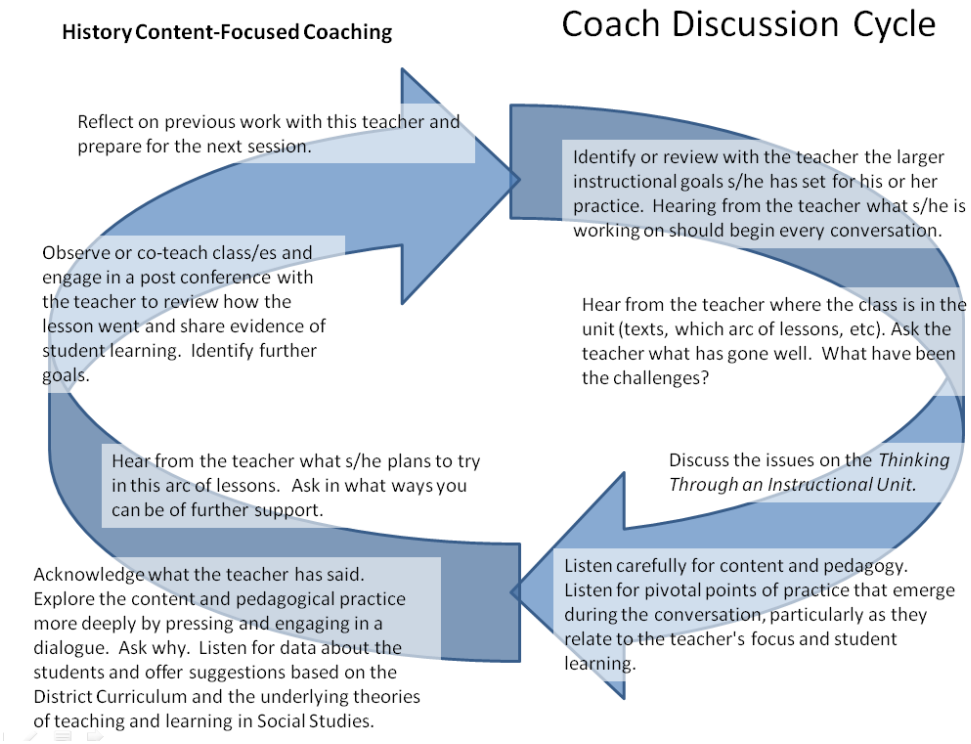

Figure 3. Content Focused Coaching model (IFL, 2013).

Regardless of how receptive the teachers were to the support provided by the DL coaches, teachers/coaches had to submit weekly artifacts of the work they were doing to the principals and other administrators. This study supports Portin and his colleagues (2003), who showed that responsibility for leadership is distributed not only among appointed leaders but also among de facto leaders—that is, individuals who, regardless of their position, exercise influence on others with respect to the direction the school is taking or should take (Portin, Schneider, DeArmond, & Gundlach, 2003). Additionally, this finding is consistent with that of Spillane (2004, 2006), who found "the organization that worked to provide teachers opportunities to grapple with the meaning of the reform proposals and to develop an appreciation for what these proposals entailed for classroom practice saw the most benefit of the reform." Eaker, Dufour, and Dufour (2002) put it best when they said, "In professional learning communities, administrators are viewed as leaders of leaders. Teachers are viewed as transformational leaders" (p. 22).

Facilitating and Impeding Factors

The participants in this study highlighted several factors that impeded their ability to fully implement the mandated pedagogical changes in inquiry-based instruction and technology: teacher beliefs, poor equipment, teacher comfort with technology, time to learn and apply new knowledge, competing expectations, student lack of access to technology and their low skills in the use of technology, and student lack of resilience in the use of inquiry-based techniques. The barriers of teacher beliefs, broken/ malfunctioning equipment, and time to apply the new learning have been discussed in the preceding paragraphs and are well documented in literature. For example, in their meta-

analysis of studies dealing with technology integration, Hew and Brush (2007) found all of Rogers' (2000) barriers represented in their model, with the exception of "funding." The lack of funding was not highlighted in their findings because it was not explicitly mentioned in the studies they reviewed. Rogers speculated that the studies reviewed failed to mention funding as a barrier because it was mentioned in terms of lack of technology, technical support, or lack of professional development. In Rogers' model, six main barriers were shown: (a) stakeholder attitudes and perceptions, (b) stakeholder development, (c) availability and accessibility of technology, (d) technical support, (e) funding, and (f) time. Kopcha (2012) stated that barriers to successful integration of technology include the time to learn and prepare technology curriculum, the beliefs needed by individual teachers to support its use, access to current and functional technology, the professional development to support staff acquisition, and, lastly, the culture of a school and system in support of technological integration. Kopcha's findings and the findings of this study build nicely on the work of Rogers (2000), Hew and Brush (2007), and Norris et al., (2012). The participants of this study reported having received professional development in the use of technology. However, that PD was sporadic and it greatly depended on the school in which they were based. As demonstrated by the findings of this study, although the aforementioned barriers were discussed in the context of technology integration, they do also apply to the development and teaching of inquiry-based lessons.

Additionally, findings in my study make a contribution the literature by highlighting several items that have been scantly addressed in policy implementation

literature: competing expectations (see Figure 4), student lack of access to technology and their low skills in the use of technology, and student lack of resilience in the use of inquiry-based techniques. In their experiencing mandated pedagogical changes in inquiry-based instruction and technology-integrated lessons, teachers in this study, whether in high school or middle school, expressed concerns regarding the number of initiatives for which they were being held accountable. Mrs. Laveran captured the experiences of her colleagues by saying that teachers were overwhelmed by a flurry of issues such as contract negotiations, high-stakes evaluation systems, and pressure to instantly implement seemingly conflicting initiatives aimed at increasing student achievement.

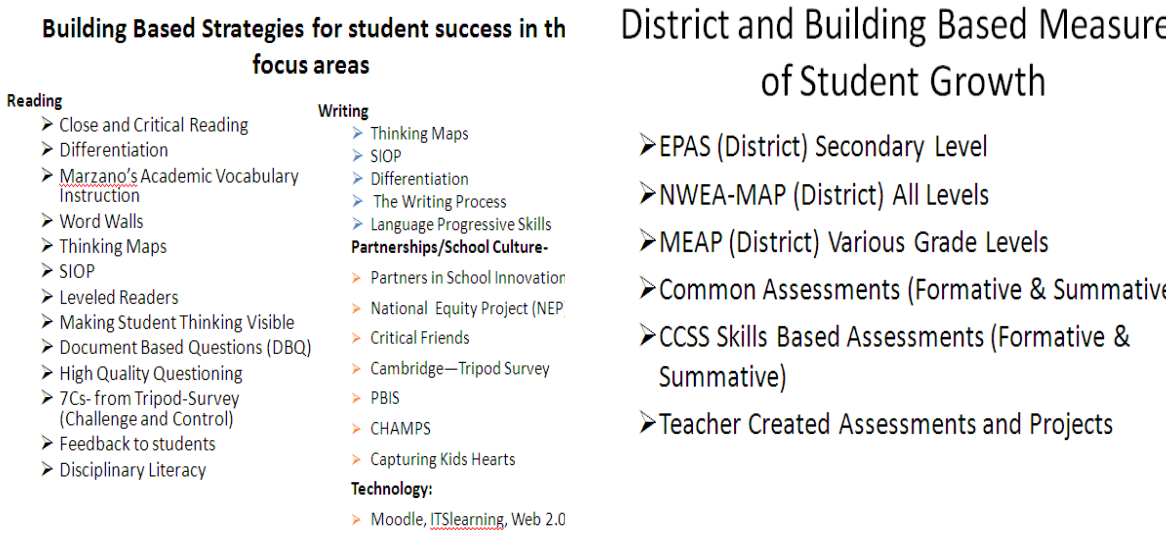

Figure 4. Competing initiatives and teacher expectations. (CPS, 2012-2013)

In Chapter IV, competing or conflicting initiatives were identified as an impeding factor to policy implementation. In addition to experiencing too many mandates in CPS, teachers reported that students were not ready to learn in an inquiry-based way. Also,

students did not have access to requisite technologies beyond the school day. If they did, they possessed little skill in using that technology in an instructional way. Regarding inquiry-based learning, both middle and high school teachers reported that students had being conditioned to "memorize and regurgitate" answers back to the teachers. When asked to approach tasks that required them to inquire deeply, students were unable to participate, resistant to work, or simply gave up. Mrs. Ross and Mrs. Müller reported similar ideas when it came to inquiry-based instruction. Their students were often afraid to give the "wrong" answer, and being afraid of the "big bad answer," the default response from students was to shut down when experiencing difficulty.

Regarding technology, teachers reported that their students, although motivated and engaged by technology-rich lessons, brought few technological skills to the table. The teachers attributed this deficiency to two factors. One, not all student had the technology at home on which to practice what they were learning in school. Two, due to budget cuts, schools no longer offered a technology class in which they would have learned basic keyboarding techniques, so they resorted to "hunting and pecking." Mrs. Ross reported that her 6th grade students lacked basic skills to conduct basic research (i.e., knowledge of the Internet, ability to identify valid sources and to properly cite sources). The findings of this study highlight the need for policymakers to consider how mandated pedagogical changes in inquiry-based and technology integration impact students, the intended beneficiaries of the changed teacher practice. Just as adults need professional development to understand new learning and time to make sense of the mandated expectations, students are not exempt from a similar need.

Limitations

There are several limitations to this study. Lincoln and Guba (1985) stated that "generalizations are assertions of enduring value that are context-free" (p. 110). First, the scope of the study was limited, since this study examined specific teachers and their practices, which were grounded in context-based experiences. Additionally, it was conducted in one urban school district located in the Midwestern United States. The findings of this study are based on in-depth 30-minute one-to-one interviews and observations of 7 social studies teachers. Because of the limited size of this phenomenological study, no generalizations about teachers, the educational policymaking process, or education in general can be made here. However, the findings of this study are important in stimulating discussion about the role of teachers in policy implementation at the classroom level and are especially important as greater emphasis is placed on inquiry-based learning and technology-rich learning experiences. In addition, Lincoln and Guba talk about "fittingness" of a study, which relies on the degree to which contexts are similar. Despite the limited scope of this study, by studying the experiences of the teachers in CPS, I was able to show that policy coherence within a system matters. Also shown in this study is that addressing policy implementation barriers does a great deal in facilitating changed beliefs, knowledge, and practice. The "thick descriptions" of the lived experiences of the teachers in this study provide a venue through which transferability could be applied. If one is to apply the principle of transferability, both contexts have to be thoroughly understood. Although sample size is an inherent limitation

of this study, this is a place where further studies done on a larger scale can provide more information.

Second, due to purposive sampling procedure, the sample size was small. Validity in qualitative research is documented through terms such as *authentic*, *credible*, and *trustworthy*. The size of sample may have decreased the credibility of the findings. The literature says delimitation narrows the scope of the study and describes the population to which generalization may be safely made (Locke et al., 2000). The findings of this study will be most impactful for the constituents of Carver Public Schools, as CPS continues to expect all social studies teachers within the system to use inquiry-based instruction and to integrate technology into their lessons.

The 7 middle and high school teachers who voluntarily participated in this study highlighted policy and implementation barriers that may be applicable to any school that may consider implementing similar systematic reforms. Five of the 7 teachers who participated in this study were Disciplinary Literacy coaches. They were chosen as coaches because they readily accepted the mandated changes and were experiencing success implementing them in their classrooms. Even though this sample appears to present a dominant position as compared to the rest of the teachers, their positions as DL coaches allowed them to be in the other teachers' classrooms. Their presence in classrooms and PLCs across the district made it possible to gain a greater understanding of how the teachers experienced the mandated changes. The sampling practices used in this study are congruent with literature on qualitative research. Regarding purposeful sampling, Creswell (2007) stated, "The inquirer selects individuals and sites for study

because they can purposefully inform an understanding of the research problem and central phenomenon in the study" (p. 125).

A third limitation of this study is that the self-report method may have produced different results from what participants actually did experience in the moment. It is essential to validate the findings of any study. Creswell (2007) stated, "Validation in qualitative research is an attempt to assess the 'accuracy' of the findings, as best described by the researcher and the participants" (pp. 206-207). To check the accuracy of the findings, any one of the eight strategies may be applied, according to Creswell: (a) triangulation; (b) peer review; (c) negative case analysis; (d) bias; (e) member checking; (f) rich, thick descriptions; (g) external audits; and (h) prolonged engagement. The first measure that was used this study was member checking. I shared the findings with participants so they could judge the accuracy and credibility of how their accounts were reported. The teacher participants reviewed the findings. The findings of this study were created using the personal narratives from 7 teachers, and they indicated that relationships matter with respect to their teaching practices. In addition to member checking, the dissertation committee audited the accuracy of this by asking clarifying questions. The audit ensured the findings were supported by the data in the transcribed interviews. The narratives are the lived experiences of the teacher participants. In creating a context, teachers occasionally reported on the experiences of the colleagues in their PLCs. The remarks stemmed from the work of some of the participating teachers who were engaged in building and department leadership positions as DL coaches.

Implications for Policy, Practice, and Organization, and Suggestions for Future Research

School leaders at all levels and educational policymakers are the potential audience for this study, particularly the hierarchy of federal and state legislators, school administrators (i.e., superintendents, curriculum supervisors, and principals), ISDs, and REAS, because these individuals and/or groups have tremendous power in what teachers are asked to do in their daily practice. My study has several implications for policy, practice, and research dealing with lived experiences of middle and high school social studies teachers with mandated pedagogical changes in inquiry-based instruction and technology-integrated lessons.

I suggest three implications with regard to policy. First, my findings might improve how policymakers at the federal and state levels work to better involve districts in the decision-making process so that they are poised to bridge the implementation gap. As Farrington et al. (2001) put it, "As anyone knows who has worked in the field, implementation of new practice is the biggest challenge of all." Providing adequate time to process and develop an actionable implementation plan would greatly increase the chances for success as district policymakers consider large-scale systematic changes. Furthermore, policymakers at all levels, especially at the district and building levels, should work with teachers in ways that empower them as co-leaders with whom they can think through possible concerns before launching into change initiatives.

> The nature of relationships among the adults within a school has a greater influence on the character and quality of that school and on student

> accomplishment than anything else. . . . The relationships among the educators in a school define all relationships with the school's culture. (Barth, 2006)

Second, my study may foster greater attention to the interplay between federal expectations in inquiry-based instruction (e.g., National History/Social Studies Standards [GLCEs and HSCE]; College, Career and Civic Life [3Cs] initiative; the Common Core State Standards [CCSS]; and National Technology Standards [NETS]). Findings in this study demonstrated that district leaders must be intentional in creating policy coherence within their systems. Third, my study may encourage educators to experiment with inquiry-based learning and technology-integrated lesson approaches in other content areas and domains within their classrooms and schools.

With regard to technology-integrated lessons and inquiry-based instruction, I suggest two implications. First, my study explored specific lived experiences of middle and high school teachers in social studies as they experienced mandated pedagogical changes in inquiry and technology. Highlighted were the two different processes for meeting the goal of technology integration. The manner in which the mandated changes were facilitated within the same district could be improved. Specifically, before expecting teachers to facilitate instruction in face-to-face and/or online environments using a learning management system or affording teachers the flexibility to implement the expectation as they see fit, policymakers at the district and building levels must make provisions to remove the barriers to implementation. Removal of barriers can be done in the form of technology that is in working order, inquiry-based resources, job-embedded professional development, and personnel to help teachers plan, enact, and reflect the

expected behaviors. Second, my study may encourage development of additional experiments in creating similar programs (inquiry-based instruction and technology-integrated lessons) for other grade levels.

With regard to further research, I present five implications. First, my study may lead to greater interest in researching the implementation and effectiveness of new evidence-based policy in school reform strategies such as inquiry-based instruction and technology-integrated lessons, as many schools are exploring online learning and revising their curriculum to better align to the Common Core State Standards. Second, additional areas for further research include changing teacher beliefs regarding teaching of social studies through professional development experiences, sustainable collaborative, professional development experiences, and lessons learned through those experiences relating to removing barriers for teachers implementing reform. This study took a step in addressing

> the greater the shift in knowledge script, the more challenging the implementation. The transfer of new ideas about instruction from the capital to the classroom is challenging not because of the will of those in district offices or school houses, but because human sense-making tends to conserve existing understandings. (Spillane, 2004)

More work is needed in answering the question of sustainability, especially when the identified reforms are being supported by grant funds with an expiration date.

Third, this study showed that teacher leadership and peer modeling were critical in moving policy from federal to state to district and into the classroom. Teacher leaders

(i.e., Disciplinary Literacy coaches) were empowered to facilitate policy implementation among their colleagues by being recognized as experts in inquiry-based instruction and technology integration.

> Viewing leadership from a distributed perspective means that education policymakers must acknowledge that the work of leading in schools involves more the leadership of the school principal . . . district policymakers need to consider how their policies on issues from leadership preparation and development to accountability reflect and support this reality. For example, do district policies, ranging from union contracts to teacher compensation, support or hinder teacher involvement in leadership work? While some school leaders can use a variety of means to engage teachers in the work of leadership, the challenge is greater if district policies fail to support such involvement on the part of teachers. (Spillane, 2006)

This study has answered the aforementioned proposed further research in the area of distributive leadership. However, further studies on the effectiveness and sustainability of changed practice in the absence of the coach are needed.

Fourth, this study highlighted the need for providing students learning opportunities in the form of well-crafted experiences to help them build the requisite skills to succeed in classrooms in which teachers use inquiry-based instruction and integrate technology. Specifically, this study revealed that, like most schools districts that are experiencing budgetary constraints, Carver Public Schools had eliminated stand-alone computer classes. It was hoped that content teachers would teach students inquiry and

technology skills simultaneously as they taught core content (i.e., history/social studies). Previous research proposed that teachers' use of technology falls along a continuum, which extends from teacher-centered methods to student-centered methods (Ertmer, Gopalakrishnan, & Ross, 2001, cited in Ertmer, 2005; Saye, 1998; Zhao & Bryant, 2006). While previous research focused on how teachers used technology in general, this study attempted to explore how social studies teachers used technology and bolstered inquiry-based methods to help students build knowledge and show comprehension. Fifth, this study showed that leadership played an important role in how teachers experienced the policy of mandated changes in technology and inquiry. Studying how principals' experience and support district mandates would shed additional light on the pressures of leading from the middle (Burch & Spillane, 2004).

Conclusion

The purpose of this study was to examine the lived experiences of 7 middle and high school social studies teachers as they experienced mandated changes in inquiry-based instruction and technology-integrated lessons. I also set out discover if mandating change really works to change teacher beliefs, knowledge, and practice. Decades of research have suggested that classroom practices were resilient to policy and other reform initiatives (Cuban, 1993; Fullan & Stiegelbauer, 1991; Meyer, Rowan, & Rowan, 1978, cited in Cuban, 1993; Tyack & Tobin, 1994). Additionally, prior studies found that policies that sought modest change compared with standards often failed to get beyond the classroom door (Spillane, 2004). This study offers a different perspective from these assertions. The teachers in this study worked hard to interpret national, state, and district

policy as it pertained to their instructional practice. This study revealed that even though teachers worked from differing definitions of technology integration and their application of inquiry-based instruction, they worked diligently to implement the policy expectations.

Teachers in this study overcame real and perceived barriers to policy implementation. One way in which they were able to overcome those obstacles was through intentional job-embedded professional development, collaboration with colleagues, and modeling. They were able to change their and their colleagues' practices because, as coaches, they began with an understanding of the teacher's strengths and beliefs. After such understanding, then the coaches created experiences that caused teachers to question their beliefs and made them aware of avenues for further growth and greater freedom (i.e., modeling, providing information and evidence through test results, etc.). "An ounce of experience is better than a ton of theory," (Kise, 2006). As it was eloquently expressed by the Consortium on Productivity in Schools (Columbia University, 1995) in *Using What We Have to Get the Schools that We Need*,

> The issue is not that individual teachers and schools do not innovate and change all the time. They do. The problem is with the kinds of change that occur in the educational system, their fragile quality, and their random and idiosyncratic nature.

Mrs. Müller, a middle school teacher who participated in this study, succinctly put it this way:

> I think that requiring inquiry-based instruction and technology-integrated lessons is not a bad thing, as long as we give teachers and students time to adjust to the

shift and learn how to work within the shift, and not expect outstanding results immediately. We have to understand that it's a learning process for our students, a learning process for our teachers, and the results will come; we just have to, as a district, expect that it's going to take more than a month; you know, it might even take more than one year, to be 100% implemented with staff and with students, as well, where we start seeing the positive results of the inquiry-based instruction and technology . . . district support in moving down this way should not be . . . this is what you need to do but we can't provide you the resources to do it. If it's an expectation and these are the things we need to get to that end result, then those things have to be provided.

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Appendix A

Sample Letter Requesting Participation

Requesting Participation Letter: Teacher

Asking Secondary Social Studies Content Teachers: "In terms of knowledge, beliefs, and practices; how do teachers experience district mandated changes in both technology and inquiry-based instruction in their daily practice?"

Western Michigan University
Joseph Kretovics, PhD
Mulonge M. Kalumbula
Educational Leadership, Research, and Technology
1420 Sangren Hall
1903 W Michigan Ave.
Kalamazoo, MI 49008-5283
[Insert Contact Information]

December 10, 2012

Dear Teacher,

The overarching goal of this study is to explore the experiences of secondary school teachers with district mandated changes in how they teach, using inquiry-based strategies and technology, in the subject area of social studies. The findings of this study may build understanding of how district policymakers and teachers navigate and implement mandated changes in instruction.

This letter is to invite you to participate in the study. By volunteering to participate you will, (1) observation of two lessons (scripted), (2) take part in a post-interview of approximately thirty minutes to reflect upon selected teaching practices (audio taped).

Your responses will be confidential, seen only by the researchers named above. All teacher identities will be masked by using pseudonyms in the analysis and reporting of the data. Your privacy will be protected by law. Field notes and audio tapes will be transcribed and then destroyed. After the study and the final report are completed, the transcripts will be filed in a secure place at the WMU main campus in Kalamazoo, MI for three years. These records will be accessible only to the researchers. All records and transcripts will be destroyed after three years.

Potential risks for participating in this research (both real and perceived), are as follows: (1) researchers perceived position of authority due to his current work in the district central office as the district social studies curriculum specialist (2) concerns of how interview responses will be collected and coded for anonymity, and (3) staff and students may find the observation to be distracting to the teaching and learning process.

Participation in this study is voluntary. If at any time you decide to discontinue participation, you need only indicate this decision to the researcher.

Thank you in advance for reading this letter and considering this request. Please return the enclosed permission slip to Mulonge M. Kalumbula. If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact (anonymously, if you wish) Julia Mayes, Ph.D., Chair Director of the Human Subject Protection Programs at Western Michigan University, by phone: (269) 387-8298

or (269) 387-3896, fax (269) 387-3696, e-mail: irb@wmich.edu, or regular mail: 3571 Sangren Hall, WMU, 1903 W Michigan Ave. Kalamazoo, MI 49008-5283

Sincerely,

Mulonge Kalumbula, Ph.D., Candidate
Educational Leadership, Research, and Technology, K-12 Leadership
[Insert Contact Information]

TEACHERS MUST SIGN BELOW AND RETURN TO ***Mulonge Kalumbula*** FOR THE TEACHER TO PARTICIPATE IN THE STUDY. PLEASE KEEP ONE OF THE ENCLOSED LETTERS FOR YOUR RECORDS.

I interested in learning more about this study.
The best way to contact me is via, Phone: Cell_____ Home_____ or E-mail:_____

_____ _____
Teacher Date

Appendix B

Informed Consent

Consent Document
Western Michigan University
Department of Teaching, Learning & Leadership

Principal Investigator: Dr. Joseph Kretovics, Principal Investigator
Student Investigator: Mulonge M. Kalumbula, Student Investigator
Title of Study: District Mandated Changes in Technology and Inquiry-Based Instruction

You are invited to participate in a study examining "District Mandated Changes in Technology and Inquiry-Based Instruction." This study is being conducted by Mulonge M. Kalumbula, Social Studies Curriculum, Supervisor a doctoral student in the Education Leadership doctoral program at Western Michigan University, under the supervision of Dr. Joseph Kretovics, his dissertation committee chair.

The following information is being provided to help you decide if you wish to participate in this study. In addition, you are free to decline participation or withdraw at anytime without affecting your relationship with the researchers or Western Michigan University.

What are we trying to find out in this study?
The purpose of this phenomenological study is to understand the experiences related to new knowledge, new beliefs and new practices required 15 secondary school social studies teachers in one urban district in response to district mandated changes in pedagogical requirements both in technology and inquiry-based instruction. Due the nature of phenomenological studies, deeper exploration of participants' experiences may reveal that personal experiences mediate response to and impact on beliefs, knowledge, and practices.

Who can participate in this study?
Eligible participants will be limited to social studies teachers who received a satisfactory evaluation and currently work in grades 6-12. For this study, a teacher who has at least three years of teaching experience in and teacher should have been teaching social studies for at least 5 years. A satisfactory teacher, for this study, is a teacher who has never received an unsatisfactory evaluation at any point in their teaching career as determined by the Grand Rapids Public Schools Human Resource Department.

Where will this study take place?
This study will take place at either:
The specific locations will involve classrooms for observations and Professional Learning Community (PLC) meetings in these eight schools.

What is the time commitment for participating in this study?
If you decide to participate you will be asked to participate in an interview lasting approximately 30 minutes. These interviews will be audio recorded to ensure the accuracy of the collected information and all interviews will be transcribed into a written record. Furthermore, you would be able to ask the interviewer to turn off the audio recording equipment at anytime during the interview. In addition to the interview, two classroom observations will take place that will be no less than 1 hour in length. As with the interview, the observation will remain anonymous with no identifiable information shared with any party, at any time. No recording device will be used for any part of the classroom observation.

What will you be asked to do if you choose to participate in this study?
If you agree to participate in this study, you will be asked to participate in one interview lasting approximately 30 minutes and two classroom observations lasting the entire class period.

What information is being measured during the study?
"In terms of knowledge, beliefs, and practices, how do teachers experience district mandated changes in both technology and inquiry-based instruction in their daily practice?" I will be looking and listening for indicators of your (1) beliefs regarding instructional technology and its use in the classroom; (2) using inquiry as a teaching approach; (3) professional development ; (4) administrative support; (5) collaboration with colleagues; (6) resources for inquiry-based instruction and technology; (7) facilitating or impeding factors; and (8) change in instructional practices.

What are the risks of participating in this study and how will these risks be minimized?
Potential risks for participating in this research (both real and perceived), are as follows: (1) researchers perceived position of authority due to his current work in the district central office as the district social studies Curriculum Specialist. To explain, in this capacity the researcher frequently works with teacher participants to organizing curriculum resources such as common syllabus, common assessments and other instructional materials. When needed, the research also coordinates district professional development opportunities in social studies. In light of this reality, we have assessed the nature and level of occupational risks and found them to be minimal. Information collected in this study will be not be connected any teacher evaluation process or occupational merit (2) concerns of how interview responses will be collected and coded for anonymity, and (3) staff and students may find the observation to be distracting to the teaching and learning process. Apart from the aforementioned risks, there are no other known risks/discomforts associated with participating in this study. To mitigate this risk, all information collected from participants will be collected in a 1-on-1 manner, therefore ensuring confidentiality. All audio transcripts will be destroyed once the transcription process has been completed and a written record is produced and you are confident that the written transcript accurately reflects your comments during the interview. Classroom observation records will also be destroyed following the completion of this study.

What are the benefits of participating in this study?
There are several potential benefits from participating in this study. The potential benefits may be applicable to the K-12 educational field as a whole and directly to the participating teacher. The potential benefits to the field of K-12 education are: (a) helping to validate, commit to, and implement the changes in instructional practice associated with the inquiry-based instruction and educational technology integration; or (b) taking initiative to investigate, propose, and implement new evidence based school reform strategies related to mandated changes instruction through policy instruments such as curriculum, assessments, technology and professional development. A potential direct benefit to the participating teacher may be that by receiving a copy of the scripted lesson via researcher's notes, and engaging in conversation with the researcher, he or she may reflect on teaching practice. The reality is, most comprehensive school reform may require both alternatives, and learning more about how teachers experience mandated changes in inquiry-based instruction and technology may provide insight for future policymakers as they consider inquiry and technology integration as reform strategies.

Are there any costs associated with participating in this study?
The costs for participating in this study are time commitment and trust of confidentiality. Teachers will dedicate approximately 2 and half hours toward this study. All information collected from participants will be collected in a 1-on-1 manner, therefore ensuring confidentiality. There are no additional costs to participants for this study.

Is there any compensation for participating in this study?
The researcher will give participants thank you cards containing a $15.00 gift card to Barnes & Noble.

Who will have access to the information collected during this study?
Ensuring the confidentiality of data is the norm in research. Your name and school name will not be used in the dissertation dissemination process; rather it will only be known to the researchers. Pseudonyms will be used for participants (i.e. Teacher 1, Teacher 2, and so on) and general terms will be used in reporting results (i.e. "Five of the teachers commented…;" "Two teachers reported that…;" etc.). Please do not hesitate to ask questions about the study before participating or while the research is taking place. I will be happy to share the results with you at the completion of the study. Raw data will be stored securely at Western Michigan University for a minimum of three years after the completion of this research.

What if you want to stop participating in this study?
You may choose to stop participating in the study at anytime and for any reason. You will not suffer any prejudice or penalty by your decision to end your participation. You will experience NO consequences either professionally or personally if you choose to withdraw from this study.

The investigator can also decide to end your participation in the study without your consent.

If you have any questions about this study, please contact Mulonge M. Kalumbula, the student investigator at (office) or (cell) or via email at kalumbulam@gmail.com. You may also contact Joseph Kretovics, Committee Chair at (269) 387-6867 (office) or via email joseph.kretovics@wmich.edu . The Western Michigan University Human Subjects Institutional Review Board (269) 387-8293 or via email at hsirb@wmich.edu, or the Vice President for Research (269) 387-8298 if any questions or issues arise during the course of the study.

This consent document has been approved for use by the researcher for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in the study if the stamped date is older than one year.

A signed copy of this consent form will be given to you for your records.

_____ _____

Participant Date

Consent obtained by: _____

Interviewer/Student Investigator

_____

Date

Appendix C

Classroom Observation Tool

Carver Public Schools

SOCIAL STUDIES LOOK FOR AND FEEDBACK TOOL DRAFT 9202012

School___ _____ Date __ __ Class Size _____

Teacher/Support Staff__ __ Content/Topic __ _ Observer __

Kalumbula_Classroom Observation Tool: Inquiry-Based Instruction and Technology Integration	
Environment/Classroom Management A. ____Classroom arrangement allows for collaboration. (Inquiry) B. ____Clear Expectations (standards/rubrics/Essential Question/Objectives) are posted/ visible. (Inquiry) C. ____Clear Expectations (standards/rubrics/Essential Question/Objectives) are referenced. (Inquiry) D. ____Model exemplary student work posted and connected to a rubric (Inquiry) ____Adequate technology available (Technology Integration)	**Evidence and/or Notes**
The Teacher ___ lecture (or film / power pt.) ___ collaborative groups ___ partnered pairs ___ individual work ___ Q&A discussion ___ guided imagery ___ interactive lecture (student reflection pts) ___ modeling ___ Socratic Seminar ___ other _____ Presentation of lesson thru ___ clickers; ___ IWB ___ Elmo ___ computer w/ digital projector	
A. ____Establishes purpose for assignments/activities (Inquiry) B. ____Teacher models apprenticeship behaviors during instruction (Inquiry) C. ____Releases students to practice apprenticeship behaviors in course activities. (Inquiry) E. ____Direct teaching and models accountable talk strategies that support various Accountable Talk Formats (Inquiry) F. ____Releases students to practice accountable talk strategies in various Accountable Talk Formats (Inquiry) D. ____Differentiates instruction to meet all students' needs (Inquiry) E. ____Balances inquiry with direct instruction when needed (Inquiry) F. ____Has students or whole class judging each other's work based on standards/exemplary work (peer feedback) (Inquiry) G. ____Aids student understanding of assignments by addressing rubrics that allow student and teachers to gauge progress (Inquiry) ____ Integrates technology into curriculum to build technology skills (such as research, corroboration, Microsoft tools, etc.) (Technology Integration)	
The Students ___ collaborative groups ___ partner pairs ___ taking notes ___ review ___ project __ reading ___ reflection of content ___ discussion with other students ___ discussion: teacher guided __ quiz/test ___ Socratic Seminar ___ Clickers ___ interactive white board ___ Computer ___ Assignment: _____ ___ Presenting _____ using ___ IWB; ___ computer w/digital project; ___ oral; or ___ Elmo A. ____Experience the content in authentic, real life and problem based ways. (Inquiry) and (Technology Integration) Monitors his/her progress using the student planner and/or other assignment tracking tools. (Technology Integration) B. ____Follows the clearly articulated routines and procedures such as voice tone/volume, A.T moves, online conduct, safety and Digital citizenry. (Technology Integration) C. ____formulates clear understanding of the apprenticeship process (Inquiry)	

Social Studies PD Initiatives
Apprenticeship: (Inquiry)
Technology integration:

Appendix D

Interview Protocol

Interview Protocol

Project: District Mandated Changes in Technology and Inquiry-Based Instruction

Time of interview: _____

Date of interview: _____

Location: _____

Interviewer: _____

Interviewee: _____

My name is Mulonge M. Kalumbula and I am a doctoral student at Western Michigan University in the Educational Leadership Research and Technology program. Thank you very much for making time to speak with me today. The purpose of this interview is to find out about your experiences with the implementation of inquiry-based instruction (i.e., the 5E framework and Institute for Learning (IFL)); and technology integrated lessons within CPS (i.e., blended learning, and teacher technology resources). This interview will take about 30 minutes. Your responses will be kept confidential. I will not identify individual respondents or their schools in my reports. I would like to record this interview to be sure I accurately capture all your comments. Is this alright?

If yes: OK for the record, please state your name and school and indicate consent to be voice recorded.

The over arching question is, "In terms of knowledge, beliefs, and practices, how do teachers experience district mandated changes in both technology and inquiry-based instruction in their daily practice?"

I will be looking and listening for indicators of your (1) beliefs regarding instructional technology and its use in the classroom; (2) using inquiry as a teaching approach; (3) professional development ; (4) administrative support; (5) collaboration with colleagues; (6) resources for inquiry-based instruction and technology; (7) facilitating or impeding factors; and (8) change in instructional practices.

Questions the subjects will be asked include:

1. Teacher Background (i.e., How many years have you been teaching? How many years have you been in the district? To what extent did your college background prepare you to teach social studies using technology and inquiry?

2. Describe opportunities for job-embedded professional development that are available to you. [Probe: Describe the ways in which you individually AND/OR IN collaboration with others have tried to initiate and/or maximized changes in inquiry and technology?]

3. In what ways do your administrators support the use of technology and inquiry in the classroom? [*PROBE: What accountability measures are in place to ensure implementation of inquiry and technology?]*

4. Do most people in this school agree about the use of inquiry and technology integration? What are some of the success and or issues? What do you think about these changes?

5. To what extent do your curriculum materials support inquiry-based instruction and technology integrated lessons? **[***PROBE: For example, what changes have been made to teachers' schedules to accommodate inquiry and technology]?*

6. Why are some teachers not using inquiry and/or technology in their classrooms? *[PROBE: What could you do to change their opinion]?*

7. What opportunities do you have to plan and collaborate with other teachers on inquiry-based instruction and technology integrated lessons? Please describe. ***[****PROBE: When and how often do you collaborate? Do you receive remunerations for this work? How?]*

8. Do you think that the choices you make in your classroom about inquiry and technology as a teacher can have an impact on your students' outcomes? Why or why not?

9. Describe how you are typically using inquiry instruction and integrating technology in your classroom. [*PROBE: Have you grown in your capacity to do inquiry learning and integrating technology in your lessons? What proportion of your lessons is inquiry based and integrates technology?]*

10. When it comes to inquiry and technology, what are your students' strengths? Weaknesses? How do you know that these are strengths/ weaknesses? Why do you think your students do well/ have trouble in this area? Have you changed your instruction in response to these strengths? Weaknesses? In what way? What has been the result?

11. What is supporting your implementation of inquiry instruction and or technology?

12. How (if at all) have your leadership strategies for making changes in social studies varied?

13. What similarities and/or differences do you see in teacher response to inquiry/technology initiatives?

14. What has contributed to the differences in teacher response (or lack thereof) [e.g. to district press, more teacher expertise, more external support]

15. Have you encountered any impediments to implementation of inquiry-based social studies and technology lessons? *[PROBE: What are these impediments?]*

16. How do students react when you use technology and inquiry in the classroom? [PROBE: Are your students more or less enthusiastic or confident about social studies as a result?]

17. Who is responsible for making sure students work to their ability in the classroom? [if they have trouble responding, prompt: Teachers? Students? Parents? What is the relative responsibility of each of these people? *Listen for people (or groups of people) and ask to say more about each]*

18. Are there any external factors that are influencing the implementation of inquiry-based and technology integrated social studies lessons such as major changes in the school or district or other initiatives? *[PROBE: In what ways do these affect implementation?]*

Closing Comments

Is there anything else that I should know regarding inquiry-based learning and technology integration at your school?

Thank you for participating in this interview. If necessary, may I contact you for a follow up interview or to clarify some of your responses?

Appendix E

Human Subjects Institutional Review Board
Letter of Approval

WESTERN MICHIGAN UNIVERSITY
Human Subjects Institutional Review Board

Date: December 12, 2012

To: Joseph Kretovics, Principal Investigator
Mulonge Kalumbula, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 12-11-34

This letter will serve as confirmation that your research project titled "District Mandated Changes in Technology and Inquiry-Based Instruction" has been **approved** under the **expedited** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study***)." Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: December 12, 2013

Walwood Hall, Kalamazoo, MI 49008-5456
PHONE: (269) 387-8293 FAX: (269) 387-8276