

**TEACHERS' PERCEPTIONS OF CONTEXTUAL INFLUENCES ON  
INSTRUCTIONAL DECISION-MAKING REGARDING THE USE OF  
EDUCATIONAL TECHNOLOGY IN SECONDARY SOCIAL STUDIES**

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A Dissertation

Presented to

The Faculty of the School of Education

The College of William and Mary in Virginia

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In partial fulfillment

Of the requirements for the Degree

Doctor of Philosophy

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by

Adam Paul Barger

June 2016

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## Dedication

This work is dedicated to Danielle Barger—my best friend and partner in life.

“And by knowledge the rooms are filled with all precious and pleasant riches.

A wife of noble character...She is worth far more than rubies” (Proverbs 24; 31).

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## Acknowledgements

With gratitude and appreciation, I recognize the significant investment of others who dedicated time and resources to my doctoral experiences. I thank my committee members—Leslie Grant, Mark Hofer, and Jeremy Stoddard—for their guidance and support. In particular, I thank Mark Hofer for his dedication and direction throughout the dissertation process. To my academic advisor, Judi Harris, I offer my sincerest gratitude for partnering with me these last six years and inspiring dedication in the face of challenge. Many thanks go to my writing group—Kerri Mahoney and Julie Marsh—for their unwavering commitment to peer review and encouragement. Finally, I acknowledge and thank the source of my desire to learn and achieve: my parents, Rebecca and David Barger. Thank you for setting me on this path. *Resurgam*.

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## Abstract

This research study was designed to explore the potential connections between teachers' contexts and their instruction. Specifically, I explored how teachers perceived contextual influences on technology-related instructional decisions in secondary social studies classrooms. I defined teachers' contexts as comprised of curricular, interpersonal, and organizational or institutional factors existing on three organizational layers, described as macro, meso, and micro. Through a multiple case study design and interpretivist perspective, I studied three cases of individual social studies teachers working in the shared environment of one high school. I viewed the teachers as curricular-instructional gatekeepers (Thornton, 2005) working in a contested classroom space (Craig, 2009). Through this lens, data generation took place at the classroom level and included interviews, observations, and artifact analysis. Data analysis was structured by the Information Ecologies framework (Nardi & O'Day, 1999) to provide a consistent approach for analysis of teachers' decision-making within and across cases.

Study findings revealed multiple contextual influences that varied in significance across cases depending on the educational orientation of each teacher. Teachers' contexts and individual educational orientations aligned to varying degrees and resulted in unique curricular-instructional gatekeeping in each case. Accordingly, instructional decision-making regarding the use of educational technology was inconsistent across cases despite the shared environment in which the three teachers worked.

Teachers' Perceptions of Contextual Influences on Instructional Decision Making  
Regarding the Use of Educational Technology in Secondary Social Studies

## **Chapter 1: Introduction**

Since the passage of the No Child Left Behind Act in 2001, public education in the United States has undergone significant changes. Mandated accountability standards, highly structured curricula, and high stakes testing are now commonplace in our schools. Despite these reform efforts, as well as increased access to educational resources such as classroom technology and web-based tools and resources, achievement remains relatively unchanged (Au, 2007; Madaus & Russell, 2010). Similarly, the often-lauded potential of the digital age to transform education has not resulted in radical changes to teaching and learning methods (Culp, Honey, & Mandinach, 2005; Journell, 2009b). Researchers have suggested nationwide curriculum standardization and increased accountability should be reexamined in favor of more focused, school-level reforms that are more relevant to teachers' unique needs (Craig, 2009; Perfecto, 2012). However, given the unique characteristics that define individual classrooms, a more thorough understanding of teachers' contexts is needed in order to illuminate these complex learning environments and better leverage educational resources.

The body of research reporting on contextual factors in classroom teaching is both multifaceted in approach and complex in description. In broad terms, teachers' contexts are described as shaped by personal, relational, curricular, and institutional characteristics (Angers & Machtmes, 2005; Au, 2007; Perfecto, 2012; Selwyn, 2011a). Related research characterizes teaching contexts as complex ecological systems, or information ecologies,

in which all decisions and actions have a role in shaping that ecology (Nardi & O'Day, 1999; Perrault, 2007). However, insight into more specific aspects of teaching and the instructional decisions teachers encounter within their immediate teaching contexts is less clear in the research base. Knowledge of the specific contextual factors that influence instructional decisions, and potentially influence how technology is utilized, is an area in need of further research if we are to better understand the current teaching context characterized, in part, by stagnating student achievement and underutilization of technology resources.

Secondary social studies classrooms epitomize the challenge of understanding the link between teaching contexts and teachers' instructional decisions. A large body of research points to best practices in social studies pedagogy that have yet to be widely adopted. Examples such as inquiry-based learning and use of digital resources have been repeatedly recognized as powerful yet underutilized pedagogical practices in social studies classrooms (Angers & Machtmes, 2005; Beck & Eno, 2012; Journell, 2009b; Manfra & Hammond, 2007). Documented roadblocks to more widespread adoption of research-based best practices are present in the literature, but our understanding is incomplete. Factors such as high-stakes testing for accountability (Madaus & Russell, 2010), access to technology (Lutnpe & Chambers, 2001), teachers' epistemic suppositions (Stoddard, 2010), and teachers' approaches to technological decisions (Harris & Hofer, 2011) help illuminate certain aspects of contextual influences on instruction. However, the confluence of these and other factors likely influence teachers' instructional decisions. It is at this intersection of contextual factors that we find an important avenue for better understanding social studies teachers' instructional decisions.

## **Statement of the Problem**

The focal point of the educational system is the classroom, yet the classroom context is not fully understood in terms of teachers' instructional decisions. The teacher acting within the individual classroom is central to the context in which important instructional decisions are made every day, yet the potential influences on those decisions are not fully delineated. Recent scholarship related to teaching contexts often points to nebulous contextual factors, such as school culture or teacher beliefs, as influential to instructional decisions (Ertmer & Ottenbreit-Leftwich, 2010; Friedman, 2009).

Alternatively, some researchers argue that context is more specifically defined as a set of common factors—such as school resources and curriculum requirements—that can be clearly identified (Lutnpe & Chambers, 2001). Both approaches are helpful for describing teaching contexts, but they do not reveal the potential influence of one's teaching context in relation to specific instructional decisions within a specific content area. Furthermore, there is a lack of scholarship that explores the interrelation of contextual factors and teachers' decisions at the classroom level. Teachers' contexts are not uniform, but divergent and dynamic. Consequently, teachers' instructional decision-making processes are highly localized and dynamic rather than standardized and static. Any investigation of teachers' contexts must therefore delve deeply into the particulars of individual teaching contexts and the related content-specific instructional phenomena.

The secondary social studies context offers a unique lens through which to explore the confluence of context and instructional decision-making. As described by Thornton (2005), social studies is a content area with a history of controversy regarding curriculum planning and enactment. The often-debated nature of historical interpretations

and social values present in social studies curricula lead teachers to make important curricular and instructional gatekeeping decisions (Thornton, 2005; van Hover, Hicks, & Washington, 2011). Gatekeeping in social studies contexts is defined as “the decisions teachers make about curriculum and instruction and the criteria they use to make those decisions” (Thornton, 2005, p. 1). Though educational technology tools and resources have equipped social studies teachers with access to potentially powerful instructional materials, their integration gives rise to complex pedagogical decisions on how best to utilize them (Journell, 2009a; Saye & Brush, 2009). The anticipated advantages of digital age instruction in social studies classrooms have yet to be fully realized, though many researchers point to the power and utility of educational technology as part of effective social studies instruction (Beck & Eno, 2012; Tally, 2007). This study aimed to more fully explore contextual factors in secondary social studies, as perceived by teachers, in order to better understand instructional decisions regarding the use of educational technology.

### **Conceptual Lens**

Two complimentary conceptual lenses shaped the approach to this study. Thornton’s (2005) conceptualization of the teacher as a curricular-instructional gatekeeper and Craig’s (2009) conceptualization of the classroom as a contested space provide important perspectives for exploring contextual influences on instructional decision making. Examination of these concepts reveals the significance of teacher decisions within the micro-context, the classroom, and provides an appropriate rationale for exploring teachers’ perceptions.

**The Curricular-Instructional Gatekeeper.** Thornton (2005) argued that social studies teachers' instructional decisions are the primary influence on how curriculum is enacted. All teaching and learning activities that take place within the classroom are a result of teachers' gatekeeping decisions, which indicate what does and does not happen in the classroom. Thornton asserted that prescribed curricula, pacing, and other standardization efforts are translated to the classroom only through teachers' decisions on how best to enact them. As a result, each teacher construes the enactment of curriculum differently and, therefore, contributes to a unique classroom context.

Recent studies utilized Thornton's framework to guide inquiries into instructional choices regarding student-created documentaries (Manfra & Hammond, 2007), an analysis of social studies as a contentious content area (Fitchett & Vanfossen, 2013), and a review of untested social studies classes in high-stakes environments (Pace, 2011). In each instance, the researchers attributed significant agency to social studies teachers as they acted as gatekeepers of content and instructional practice. Further research has reinforced Thornton's gatekeeper framework by exploring deeper issues of teacher beliefs and preferences. Stoddard (2010) examined epistemological beliefs as observed through social studies teachers' gatekeeping choices regarding types of media used in instruction. Similarly, van Hover and colleagues (2011) reported that social studies teachers' gatekeeping shapes how they "make sense" of instructional expectations such as meeting the needs of diverse learners. The present study emulated aspects of these applications of Thornton's curricular-instructional gatekeeper in terms conceptualizing teacher agency, beliefs, and decisions. Thornton's conceptual lens is complimented by

Craig's (2009) assertions regarding the educational environment within which gatekeeping takes place.

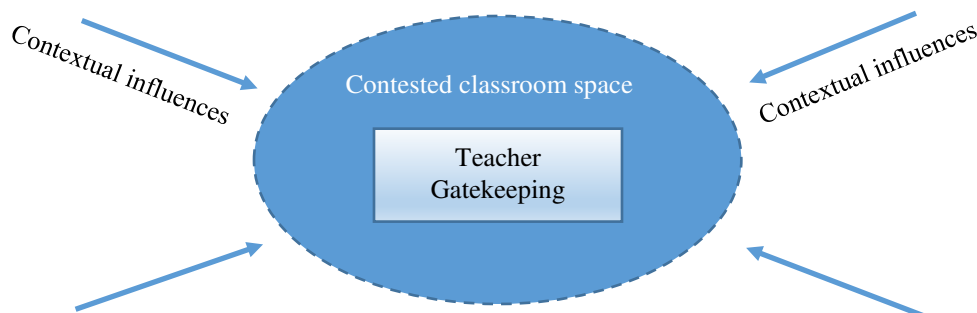
**The Contested Classroom Space.** Craig (2009) described the learning context as the figurative *space* or the discretionary area where teachers and students actively live the curriculum. Classroom space refers to “opportunities for teachers and students to interact and negotiate matters of curriculum within the in-classroom place on their school landscapes” (p. 1042). Craig asserted that classroom space is bound by context in that it is influenced by outside forces such as policy, institutional demands, and instructional imperatives. Furthermore, the increasing demands of such outside forces have a restricting effect on the teachers’ freedom and discretion in class (Craig, 2004, 2009). The result is the contested classroom space in which there are competing contextual forces influencing teaching and learning.

Recent research concerning the contested classroom space and the related instructional effects support the concept as relevant to many social studies teachers’ contexts. Journell’s (2010) qualitative study of six government teachers utilized the contested classroom space lens to conceptualize the pressures resulting from state-mandated tests affecting teachers’ decisions to incorporate current events activities. Journell reported that some participants often placed curriculum coverage as the paramount instructional concern when making pedagogical decisions. This effectively narrowed the curriculum and constrained teachers’ decisions within the classroom space. Similar findings in related research have reinforced the notion that the classroom space is contested by curricular and institutional factors that influence instructional practices (e.g., Au, 2007, 2009; Darling-Hammond & Rustique-Forrester, 2005). Accordingly, I used



Craig's (2009) contested classroom space rationale to characterize the restrictive context in which teachers make gatekeeping decisions regarding technology integration.

**A unified lens for exploring context.** Together, the curricular-instructional gatekeeper and contested classroom space concepts provide a practical lens for exploring teachers' contextual influences on technology-related decisions. The teacher as curricular-instructional gatekeeper is the final arbiter as to how technology is integrated (Manfra & Hammond, 2007; Thornton, 2005) and therefore is an important focal point for exploring instructional decisions in the classroom context. Teachers make gatekeeping decisions regarding content, pedagogy, and technology on a daily basis (Hammond & Manfra, 2009; Pace, 2011). Upon initial review, this perceived power and influence assigned to teachers may seem to conflict with the concept of the contested classroom space and the limited opportunity for lived curriculum (Craig, 2009). However, what is proposed here is that the gatekeeping concept exists within the notion of the classroom as a contested space (see Figure 1). Teachers make many crucial decisions in their daily planning and delivery of instruction, and those decisions are confined to the limited freedom, or agency, of teachers due to the contesting variables of the complex teaching context. Use of educational technology as part of the classroom space and teachers' instructional gatekeeping calls for careful consideration of what influences, or fails to influence, teachers in their daily instructional decision-making.



*Figure 1. A unified lens. Thornton's (2005) gatekeeper operating within a contested classroom space (Craig, 2009).*

As illustrated in Figure 1, the teacher as the curricular-instructional gatekeeper is limited in agency by contesting factors of the classroom space. This space is shaped by contextual influences relevant to the teaching locality. Though many contextual factors potentially influence teachers, not all factors contest the space equally.

The conceptual lens described above shapes the necessary assumptions for exploring a social studies context. These assumptions of gatekeeping and space framed this study in terms of inquiry methods. However, a broader theoretical framework that encompasses specific aspects of technology use in context was necessary for a structured analysis of multiple cases. I address this need in Chapter 3 by discussing the use of the Information Ecologies framework (Nardi & O'Day, 1999) for a systematic analysis that supports the interpretivist approach of this study.

### **Statement of Purpose**

The purpose of this study was to delve deeply into specific teaching contexts in order to better understand what factors influence teachers' instructional decisions. Utilizing a qualitative approach to multiple case study analysis, I explored secondary social studies teachers' perceptions of how contextual factors influence educational technology

integration decisions. A focus on particular types of decisions, those related to technology use, within a specific content area such as social studies enabled a fuller examination of the teacher's context. By viewing the teacher as the curricular-instructional gatekeeper (Thornton, 2005) working within an increasingly demanding and standardized educational environment (Craig, 2009), I examined the contested space of select secondary social studies contexts. Additionally, I endeavored to richly and thoroughly describe how broad contextual factors may or may not influence specific instructional practices in secondary social studies classrooms.

### **Research Questions**

The following research question and related sub-questions guided this study:

How, if at all, does context influence social studies teachers' classroom use of educational technology? Specifically,

- a. How do teachers perceive the influence of interpersonal, institutional, and curricular context factors on their instructional decision-making regarding technology use?
- b. How, if at all, do teachers perceive contextual factors as contesting the classroom space in which technology related instructional decisions are made?

## **Chapter 2: Review of the Literature**

Understanding social studies teaching contexts requires a comprehensive approach to researching the curricular-instructional norms as well as the interpersonal and organizational factors common to most classrooms. The intersection of educational technology and social studies pedagogical methods creates a complex setting in which to explore teachers' contexts. For the purposes of this review, the current state of social studies pedagogy and technology resources is addressed first, followed by thorough explorations of contextual influences and instructional decision-making.

### **Social Studies Pedagogy and Educational Technology**

Educational technology in social studies classrooms creates varied pathways for teaching and learning social studies in new or innovative ways. Extant literature points to educational technology supporting social studies teachers' efforts for a variety of instructional approaches. Recent examples include technology integration for kinesthetic learning (Mobley & Fisher, 2014), playful learning or experimentation (Kee, 2014), flipped teaching (Driscoll, 2012), and digital story telling (Lee & Molebash, 2014). Other prevalent uses leverage digital technology to expose learners to rich multimedia repertoires for exploration and enrichment (Callahan, 2013; Hicks & Doolittle, 2008; Saye & Brush, 2007). Teachers can utilize digital tools and resources to connect learners with the content area through expanded access to information and new approaches to engagement. Accordingly, social studies educational technology applications often follow

pedagogy that focuses on active learning through a constructivist approach to teaching (Moore, Beshke, & Bohan, 2014; Saye & Brush, 2009). Though recent examples of digital age teaching and learning garner attention from researchers, many studies document the clear underutilization of technology in that practitioners often use technology tools minimally or for basic information gathering functions (Doolittle & Hicks, 2003; Lee & Friedman, 2009; Swan & Hofer, 2008).

Social studies teachers tend to use technology tools and resources in ways that support their pedagogical aim. Didactic approaches that emphasize fact-recall or rote memorization are common in classrooms with standardized curricula and high stakes testing (Au, 2009; Levstik, 2008). Despite this reality, the literature base strongly supports more active pedagogical aims such as inquiry-based learning in which students begin with probing questions and move towards content investigation, idea connections, and new knowledge creation (Beck & Eno, 2012; Saye, 2013; Stripling 2003, 2010). Social studies education is dynamic and is characterized by varied approaches to curriculum planning, content, and preferred pedagogy (Massialas & Hanna, 2009; Thornton, 2005). Current approaches to social studies in secondary education call for the use of inquiry-based instructional practices in an environment that often takes advantage of educational technology tools to help students learn and communicate (Bennett, 2010; National Council for the Social Studies [NCSS], 2013). A vast literature base reveals current pedagogical trends involving educational technology as well as documented practical applications of technologies in social studies classrooms. Related literature considers barriers and critiques regarding technology integration in education generally and in social studies specifically.

**Pedagogical trends with educational technology in social studies.** Social studies education is a unique content area in that the use of educational/digital technologies offers possibilities for helping teachers support discipline-based skills such as historical thinking (Miller & Toth, 2012), civic participation and discussion (Journell, 2009a), academic discourse (Mason & Metzger, 2012), and student inquiry (Clabough & Turner, 2011). These approaches promote authentic learning and knowledge construction that bolsters inquiry-based instruction as the signature pedagogy in social studies education (Beck & Eno, 2012; Saye & Brush, 2007).

Beck and Eno (2012) described educational technology in social studies classrooms as a potential bridge to inquiry and authentic applications. Their review of 121 peer-reviewed articles indicated that an inquiry-based approach is much more realistic and attainable in the complex environment of modern social studies classrooms when implemented with the inclusion of educational technology tools and resources. However, this should not be interpreted to mean that such tools guarantee a pathway to inquiry-based methods. Instead, educational technology is seen as a way to access greater amounts of information, in various forms and mediums, so teachers can tailor engagement with the content in a more personal and authentic way. Manfra and Hammond (2007) similarly supported the idea that educational technology can provide new opportunities to engage with the curriculum in a constructivist manner, such as inquiry, but these opportunities are balanced with the teacher's pedagogical aims. Their multiple case study showed that the "teachers' instruction and the students' final products reflected the original pedagogical aims far more than the impact of the teachers' choice of technological tool or selection of content" (p. 239). Though educational technology may

provide a bridge to inquiry in social studies classrooms, teachers' overarching pedagogical goals must first reflect such a path by incorporating digital tools and resources in a way that promotes inquiry. Accordingly, research emphasizing the potential of using educational technology in social studies to facilitate inquiry in the classroom continues to develop as technology tools emerge.

Content-specific technology applications allow teachers to take advantage of technological affordances to address practical concerns as to how inquiry can be encouraged (Saye & Brush, 2009). Some educational technologies are particularly well suited for use in the social studies classroom because they are based on creative, interactive, and collaborative applications that benefit social studies teachers through expanded instructional options (Bull, Hammond, & Ferster, 2008). In particular, Bull et al.'s review of web-based social studies tools argued that content-specific tools that align well with desired pedagogical aims, such as the use of digital primary sources in secondary social studies classes, might yield significant pathways to conceptual understandings. Similarly, Journell (2009a) suggested that the true value of technology in the social studies classroom is to help teachers move from recall to inquiry and, as a result, develop a better sense of historical empathy or identification with the human aspect of social studies. These real-world connections with social studies content are attainable through well-designed lessons that align inquiry-based pedagogy with constructivist technology applications (Bennett, 2010). In general, these studies point to the centrality of pedagogical aims that are supported by educational technologies. Such applications in empirical research further illuminate the important connections between

inquiry-based constructivist learning and technology integration in social studies classrooms.

**Practical applications of educational technology in the social studies context.**

Beyond greater access to information for inquiry practices, extant literature concerning recent applications of educational technology in social studies suggests three general formats for integrating technology. These include organization and scaffolding, collaboration and interaction, and new knowledge creation. Research on specific applications of each format yield practical implications for teachers' instructional decision-making regarding educational technology.

*Organization and scaffolding.* Technology applications involving the use of organizers and scaffolding to promote inquiry and authentic learning exist in various social studies environments. Boon, Fore, and Spencer (2006) studied the perceived influence of digital graphic organizers in inclusive high school social studies classes. They reported that teachers perceived improvement in student achievement, time management, and motivation. Similarly, Mutlu's (2009) review of concept mapping as a strategy for teaching complex social studies concepts to second language learners pointed to digital organization tools as helpful for making content connections and aiding reading comprehension. Various forms of digital organizers, including graphs, illustrations, and diagrams are helpful in aiding comprehension of potentially dense or difficult subject matter in social studies classes (Cruz & Thornton, 2012). Such visual representations are tangible scaffolds for promoting inquiry and learning in social studies. Knowledge scaffolds, those digital resources that help organize content knowledge and encourage new knowledge connections, provide similar advantages.



Educational technology tools and resources can equip students by scaffolding content and digital resources to help students structure their knowledge. In a review of exemplary inquiry-based websites, Clabough and Turner (2011) found websites that promote students' interaction with social studies content engage learners by positioning them as active participants and scaffolding their knowledge. The authors pointed to the value of leveraging social studies-related websites that encourage students to become "active agents interacting with the content they study in order to reach toward deep processing and inquiry" (p. 102). A study of 77 undergraduate students participating in a historical inquiry project revealed the importance of specific conceptual scaffolding for evaluating primary sources (Hicks & Doolittle, 2008). The authors reported that students who engaged in a multimedia scaffolding tutorial for applying a specific inquiry strategy exhibited a deeper understanding of the inquiry process. Another approach to scaffolding with technology showed the value of digital agents modeling inquiry skills such as sourcing, contextualizing, and corroborating sources in an online tutorial for critical thinking (Miller & Toth, 2012). The digital agents provided audio and visual cues that supported learners as they navigated a past event. In these studies, digital tools and resources provided specific points of help to support learners in social studies learning processes. Another prevalent example of such scaffolding in social studies is the use of webquests to guide exploration of digital resources.

Webquests are activities for incremental steps of inquiry for the Internet (Lombard, 2005). They often include explicit instructions, hyperlinks, relevant questions, and opportunities for student to analyze and synthesize information they find on the Web (Journell, 2009b; Molebash & Dodge, 2003). Though often used in social studies,

webquests are a scaffolding strategy for building knowledge through web-based inquiry in varied content areas (Harris, Mishra, & Koehler, 2009). Extant literature characterizes webquests as a useful strategy for exposing students to a variety of media and opinions while encouraging scaffolded synthesizing of content (Bates, 2008; Day, 2012; Jenkins, Clinton, Purushotma, Robison, & Weigel, 2006). In a review of the webquest creation and implementation process, Day (2012) argued that the webquest process leverages primary source documents and images to promote critical thinking through the research process. In terms of navigating the vast resources found on the Internet, webquests provide the scaffolding and organization necessary for student inquiry.

These examples reflect the significance of utilizing technology for organization and scaffolding and, as such, reinforce the important notion of transformational and personalized technology applications (Cummings, 2014). Organizing and scaffolding are important starting points for educational technology in social studies. However, multiple studies have additionally examined tools and resources in a second format: fostering collaborative and interactive activities.

***Collaboration and interaction.*** Inquiry-based instruction often includes thoughtful collaboration with peers and interaction with the content as students engage within the learning environment. Technology can support these endeavors and yields tangible affordances that specifically point to enhanced collaboration and interaction (Bull et al., 2008; Francis & Davis, 2013; Jung Won, Tan, Brush, Saye, & Chen, 2005).

Multiple researchers noted the significance of student collaborative engagement in some form, whether to form an original idea (Bennett, 2010), written response or discussion post (Larson, 2003), or a video presentation (Staley, 2004; Yow & Swan,

2009). In a review of web-based tool use in social studies, Kingsley and Brinkerhoff (2011) lauded the capacity of social media, blogs, wikis, and other collaborative platforms to construct and communicate knowledge in divergent ways. Heafner and Friedman's (2008) quasi-experimental study of two secondary social studies classes found increased motivation, engagement, and interest on the part of students who collaborated in discussions and wiki posts. In related research, Alexander (2014) studied sixth graders' collaboration and engagement with social studies content when using a digital storyboarding application. He concluded that students can experience increased engagement from such digital media assignments and can benefit from structured scaffolding on how to navigate the learning experience.

Opportunities for interactive and engaged learning experiences are inherent in many technology tools and resources that enable collaboration. Interactive uses of technology offer useful pathways for learners to engage with social studies content in multiple ways. Recent research supports clear affordances for leveraging technology to increase active engagement among learners and encourage inquiry (Friedman & Garcia, 2013; Hammond & Manfra, 2009). A media analysis of a civics simulation game concluded that the interactive real-world environment of the simulation engaged learners and promoted critical thinking and problem-solving skills (Moore et al., 2014). In similar research on gamification in social studies, McCall (2014) found that digital simulations are powerful ways to promote interactive learning because they are "a dynamic and, to some necessary extent, simplified representation of one or more real-world processes or systems" (p. 229). Educational technology integration that promotes engagement with content in ways that relate to real-world scenarios and systems beyond the classroom

promotes learner interest (Barger, 2015; Kingsley & Brinkerhoff, 2011). Digital multimedia sources promote similar connections for social studies teaching and learning.

Multimedia sources, including audio, video, web-based media, and imagery, can be utilized to promote interactive content in collaborative or individual learning scenarios. Using classroom technology to display and interact with educational and feature films can be a powerful format for encouraging learner engagement. A significant literature base supports the use of film and video to promote interest, engagement, and discernment (e.g., Butler, Zaromb, Lyle, & Roediger, 2009; Marcus & Stoddard, 2007; Russell, 2012). Metzger's (2010) review of history films in social studies classrooms concluded that films and images help teachers stimulate critical thinking and inquiry as students think broadly about topic and modern viewpoints. Other media can similarly help activate knowledge connections through interacting with primary image sources (Friedman & Garcia, 2013) and listening to speeches or read-aloud text (Bouck, Okolo, Anna, & Anne, 2009; Rose & Strangman, 2007). To support such uses, a vast repository of multimedia sources is accessible to social studies teachers to support interactive pedagogy and engaged learners.

In each of the applications discussed above, student collaboration was enabled or enhanced through the well-planned use of educational technology. Bull et al. (2008) argued that the most tangible benefits of utilizing educational technologies to enhance interaction and collaboration are observed under the guidance of a skilled teacher. Teachers' pedagogical practices heavily contribute to more richly developed conceptual understandings of social studies content. From this point of deeper understanding, related

literature points to student creation of new knowledge as a third format for educational technology use in social studies classrooms.

***New knowledge creation.*** Technology applications that prompt students to take action, construct meaning, or create new knowledge through meaningful engagement with the content allow learners to connect content with their lives and participate in authentic learning (Angers & Machtmes, 2005). For example, Manfra and Hammond (2007) presented case studies of social studies teachers who implemented student-created digital documentaries. Students interacted with the content to research and create documentaries that demonstrated their understanding and application of the area studied. Though some students seemed to succeed in participating in inquiry and developing a deeper understanding and connection to the content, others did not. In this example, Manfra and Hammond reiterated the importance of the teachers' pedagogical aims in how successfully educational technology is utilized to create knowledge. They concluded that a constructivist framework should undergird teachers' pedagogical aims to effectively leverage technology integration for inquiry. Building on this work, Hammond and Manfra (2009) described a three-part model to more explicitly link teachers' pedagogical aims with student construction of knowledge and meaning. The authors characterized the third part, termed *making*, as crucial to deep understanding due to the "divergent knowledge expression" (p. 174) that is elicited when students create or construct new meaning. In similar research, podcast creation (Swan & Hofer, 2011) and digital documentary making (Swan & Hofer, 2013) supported teachers' efforts to elicit students' exploration and expression of content knowledge. These studies exemplify the range of knowledge demonstrated by what NCSS (2013) frames as the nature of inquiry: asking

questions, exploring content, and communicating new conclusions in the pursuit of knowledge.

New knowledge creation through meaningful engagement with content takes the form of perspective and empathy development as well. Saye and Brush (2007) argued that technological affordances help students create realistic representations of social studies content, which encourages learner empathy and engagement. Similarly, a qualitative study of five sections of a U.S. History course revealed overall positive learning experiences for students investigating firsthand accounts of 9/11 survivors (Friedman & Garcia, 2013). In the study, three classes engaged with primary sources and media through the use of an iPad. Two classes used the same sources, but engaged with them through the use of a paper packet. Results indicated greater interest and recall for the students using iPads. Though the researchers discussed study limitations such as a novelty effect associated with the technology and the relevancy of the topic, clear indications of technology use for meaningful engagement were shown as a result of the varied media options made possible with the iPad. Technology applications support relevant connections with social studies and avenues for developing new knowledge and historical empathy (Luckhardt, 2014).

Despite the theoretical support and practical success of inquiry and educational technologies in social studies discussed here, the research-practice gap persists. Though successful applications of enhancing inquiry with technology in social studies classrooms are well established, widespread use of technology tools and resources does not exist in the majority of social studies classrooms (Debele & Plevyak, 2012; Saye & Brush, 2009;

Swan & Hofer, 2008). This underutilization can be explored in terms of conditions within which educational technology is or is not used.

### **Barriers and critiques of educational technology in social studies classrooms.**

Perceived underutilization of technology in secondary social studies is a widely studied phenomenon (e.g., Beck & Eno, 2012; Journell, 2009b; Swan & Hofer, 2008; Valdez, Reich, & Berson, 2010). However, whether such underutilization is an outgrowth of specific barriers or due to targeted critiques of educational technology is unclear. A review of relevant scholarship illustrates both the perceived barriers and the specific critiques regarding educational technology use in social studies classrooms.

**Barriers.** Research suggests teacher-perceived roadblocks contribute to the conditional utilization of technology in social studies. Several researchers contend that underutilization is a result of a lack of technology access, appropriate professional development, and an encompassing pedagogical perspective that is restrained by routinized or ingrained instructional practices (Journell, 2009b; Saye & Brush, 2009; Yow & Swan, 2009). Angers and Machtmes (2005) argued that teacher beliefs within and about their context in relation to technology use greatly influences the underutilization of educational technology. Their study of middle school teachers revealed the power of teachers' favorable or non-favorable view of technology and the resulting use of technology in their classrooms. Similarly, Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) explored the theoretical underpinnings of roadblocks to educational technology use and targeted teacher beliefs and values as core to the problem. From their perspective, teacher technology literacy and exposure to effective models of technology use is imperative to overcoming these beliefs, or disbeliefs, as roadblocks. As with any

instructional initiative, the limitations of time for both professional development and instructional implementation of technology are an ever-present challenge (Angers & Matchmes, 2005; Chen, Looi, & Chen, 2009; Journell, 2013). However, perceptions regarding use of educational technologies are couched within the physical and institutional conditions of the educational environment.

The technological infrastructure and access to some educational technologies are documented aspects blocking wide use of educational technologies (Lutnpe & Chambers, 2001). Specifically, instructional resources and materials that work within the technological infrastructure are crucial to teachers' use of educational technology (Ertmer & Ottenbreit-Leftwich, 2010). Both the availability and workability of technology influence teachers' willingness to try such resources in their teaching (Debele & Plevyak, 2012). Students' access to computers and the Internet, both in and out of school, are key considerations for teachers as they weigh the time investment of implementing computer-based activities versus the time constraints of a mandated curriculum with high-stakes testing. For example, a qualitative study of eight schools with varying socioeconomic statuses (SES) suggested that lack of access to computers and related technology in low SES schools was a more of a barrier to technology use than such efforts in higher SES schools due to the pressure on teachers and students to raise test scores (Warschauer, Knobel, & Stone, 2004). This uneven access, often referred to as the digital divide, further characterizes the instructional environment and methods in schools.

Established instructional methods are part of the social conditions and institutional norms that exist within schools (Saye & Brush, 2009). The socio-cultural environment of a school or district influences instructional procedures in that history,



habits, and traditions carry significant value among educators (Ertmer & Ottenbreit-Leftwich, 2010). Selwyn (2011a) asserted the institutional norms and expectations of an educational environment are powerful forces that sometimes serve as roadblocks to technology integration at various levels of authority within the organization:

Digital technology use in schools is shaped at different times by different actors with different motives and rationales. It therefore makes sense to contextualize school technology in terms of the mounting administrative and managerial pressures that many people at all levels of the school organization face in relation to increasingly “intensified” forms of education. (p. 93)

Selwyn refers to the pressures of technology in terms of the subcultures that must contend with the expectations of technology use and the reality of the potential roadblocks inhibiting such use. However, conditions that favor effective educational technology are documented as well.

Conditions that favor or encourage educational technology use include knowledge of the relationship between pedagogy and educational technology (Hammond & Manfra, 2009), knowledge of content specific activities and related technologies (Harris & Hofer, 2011) and teacher beliefs favorable to technology and technology literacy (Ertmer & Ottenbreit-Leftwich, 2010; Glassett, 2007). Each of these aspects is directly or indirectly linked to the teacher and his or her pedagogical aims. Organizational or institutional conditions have been documented as well. Glassett’s (2007) examination of exemplary technology using teachers found that resource-rich contexts, collegiality, and professional development all played important roles in creating conditions favorable to educational technology use. Saye and Brush (2009) documented similar findings in their examination

of technology affordances in inquiry-based learning. They asserted that professional development and a sense of professional community are necessary in order for educational technology to thrive within an organization. However, such efforts would be dependent on the access, funding, and infrastructure aspects discussed earlier. Additionally, organizational acceptance of educational technology as a valuable tool is not universal. Scholarship that is critical of unfettered support of educational technology illustrates the need for a balanced perspective.

***Critiques.*** A common assumption, whether stated or unstated, in educational technology literature is that of an inherent positive value of technology. Selwyn (2012a) characterized this as the “ed tech bubble” (p. 331) because much of the research is inward focused and targeted to avid users of educational technology. Critiques of common approaches to educational technology often come from scholarship aimed at questioning the utility of technology as a value added to traditional pedagogy (e.g., Selwyn, 2011b; Wozney, Venkatesh, & Abrami, 2006). Cuban, Kirkpatrick, and Peck (2001) found that only 4 of 13 teachers in a qualitative study made significant changes to their instructional practices as a result of integrating technology. Most teachers cited lack of time, both for technology exploration and training, as the most significant factor inhibiting them from leveraging technology to transform teaching practices. Characterized as the “slow revolution,” the lack of technology use described in this study points to impracticality as a critique of educational technology (Cuban, Kirkpatrick, & Peck, 2001, p. 829). More recent scholarship critiques technology integration in terms of misplaced or unrealistic expectations and the lack of focus on the socio-cultural conditions surrounding those expectations.

Educational technology research often focuses on the *should* or *could* aspects of technology integration rather than the larger “social nature” of technology use (Selwyn, 2012b). Managing these misplaced or unrealistic expectations requires examining the *state of the actual*, the practical or real-world happenings in classrooms, instead of focusing on *state of the art* possibilities (Selwyn, 2011a). Studies reviewing educational technology applications in terms of *the actual* reveal critiques of technology in everyday practice rather than experimental treatments. Hall (2011) theorized the importance of viewing technology as a neutral, rather than positive, addition to learning environments. Furthermore, he advocated a focus on socio-cultural contexts of technology in order to better understand the (non)use of technology in the classroom.

Critiques of educational technology in specific social studies contexts have shown socio-cultural influences on technology adoption (Tally, 2007). The aforementioned technology-specific study on the use of iPads in a social studies unit reported overall positive learning experiences for students; however these experiences were set in a highly relevant societal focus on September 11, 2001, and after the death of Osama Bin Laden (Friedman & Garcia, 2013). The researchers noted the significance of this cultural relevance and pointed to the social nature of student interest as an important consideration, or limitation, of investigating technology use in social studies. The challenge of using educational technology in ways that embrace socio-cultural realities is a persistent critique that should be addressed through practical, or *state of the actual*, examinations in social studies classrooms. Taking this approach accounts for the larger environment, or context, in which social studies teaching and learning takes place while encouraging a more critical, rather than idealistic, interpretation.

Whereas the perceived challenges to technology use offer insight to teachers' perspectives, current research has yet to fully answer why many social studies teachers decide not to utilize educational technology. Though some social studies-related research exists that links school culture (Saye & Brush, 2009) or mandated curriculum (Journell, 2009b) to technological pedagogical decisions, a more comprehensive approach is needed. A broader examination of the teaching context and the perceived influences on social studies teachers' instructional decision making will yield more complete perspectives on broadly embraced educational technology use.

### **The Teaching Context**

Extant literature on the teaching context and contextual influences is diverse and complex. Researchers have explored the teaching context and characterized it with multifaceted factors such as curricular issues, interpersonal relationships, and organizational or institutional characteristics that potentially influence what happens in the classroom (Journell, 2009b; Molebash, Capps, & Glassett, 2009; Perfecto, 2012; Perrotta, 2013; Selwyn, 2011a). The research in each of these categories reveals aspects of the teaching context that more fully describe the intricacies of teacher decisions and influences. External influences on teaching practices cause an overlap between teachers' own beliefs about educational technology and barriers that exist within their teaching context (Chen et al., 2009). Selwyn (2011a) described this complexity as a workplace tension in which,

the (non)use of digital technologies in schools must be understood (at least in part) in terms of teachers' ongoing negotiations of their day-to-day work—a process that involves meaning-making and fitting various technologies with the

“job” of being a teacher and, conversely, fitting the “job” of being a teacher with the demands of digital technology. (p. 103)

Similarly, Rosenberg and Koehler (2015) argued that the educational technology teaching context is both “that which surrounds” the teacher and “that which is woven together” with the teacher (p. 441). Essentially, teaching contexts include both external influences and a confluence of factors that create a unique system. Such complexity warrants an exploration of context that is both descriptive and comparative. The following examination of literature related to teaching contexts first explores contextual factors, those day-to-day influences referenced by Selwyn. Secondly, contextual layers are examined to reveal levels of comparison between micro, meso, and macro contextual influences (Porrás-Hernández & Salinas-Amescua, 2013; Rosenberg & Koehler, 2015).

**Contextual factors.** Curricular, interpersonal, and institutional factors encompass much of the interwoven factors that make up teaching contexts. Though these factors overlap, it is useful to explore each as an individual influence on the teaching context. Here again, inquiry-based learning is visited in order to frame key curricular factors of social studies teaching contexts. Teachers must negotiate the tension within their contexts in terms of standardized curriculum, high-stakes testing, and the preferred pedagogy of inquiry-based instruction.

***Curricular factors: Inquiry and authentic learning in social studies.***

Pedagogical practices discussed in secondary social studies literature usually take the form of either direct instruction or inquiry-based approaches (Beck & Eno, 2012). However, inquiry-based practices are widely recognized as valuable and formative in modern secondary social studies classrooms due to the student-centered nature of the

approach (Barton & Levstik, 2004; Saye & Brush, 2007; NCSS, 2013). Inquiry in social studies has a consistent and ongoing presence in teacher education and social studies methods textbooks (Beck & Eno, 2012; Ross, 2006; Wojcik, Heitzmann, Kilbride, & Hartwell, 2013). There are several aspects of inquiry-based instruction in social studies that uniquely engage students and promote learning, such as historical questions, primary sources, and authentic processes.

Inquiry in secondary social studies is shown to promote authentic learning, which is described as students asking applicable historical questions and examining relevant historical contexts and sources that relate to those questions (Saye & Brush, 2007; Swan & Locascio, 2008). In this way, inquiry is authentic due to the real and relatable connections made by students to their worlds beyond the school classroom. Saye and Brush (2007) delineated three core aspects of the authentic inquiry process; students will:

1. Use prior knowledge and rules of evidence to engage in disciplined inquiry about meaningful problems;
2. Communicate their conclusions in complex ways; and
3. Produce work that has value beyond school. (p. 197)

Similar descriptions of student-centered processes that encourage authentic learning in social studies are generally accepted as well-grounded pedagogy in the field (Levstik & Barton, 2005; Swan & Locascio, 2008; Whelan, 2006). Despite the strong theoretical and empirical research favoring inquiry in secondary social studies classrooms, practicing teachers do not consistently employ these methods (Fragnoli, 2005; Hicks & Doolittle, 2008). This suggests that some factors, including non-pedagogical factors, may influence teachers' instructional decisions. Some research suggests the inconsistency is due to

competing purposes for social studies instruction; specifically between fact-recall standardized learning and the authentic processes described above (Au, 2009; Beck & Eno, 2012; Fragnoli, 2005).

Teachers' attitudes towards curriculum, and how best to enact it in their classrooms, do not always inform their instructional decisions. Fragnoli (2005) observed a gap between theory and practice when studying pre-service teachers' attitudes and beliefs concerning inquiry and their hesitations to implement related strategies in the classroom. The case study of two classes of pre-service social studies teachers concluded that content knowledge, confidence, and the presence of professional reflection were clear indicators of teachers' instructional decisions; whereas value of the inquiry-based teaching process bore less influence on those decisions. Similarly, Reisman's (2012) quasi-experimental study of an inquiry-based instructional intervention found that inquiry practices are still emerging due to the well-established structures of teacher-centered instruction found in most schools. However, Riesman noted that inquiry can, and likely will, continue to take hold as a preferred pedagogy as teachers are further exposed to tools and resources that can help in implementing inquiry-based instruction. Research on personal digital histories by Lee and Molebash (2014) similarly concluded that teachers' pedagogical orientation must be developed through exposure to robust inquiry experiences supported by technology use. Such tools and resources can be found through educational technology applications in secondary social studies (Bull et al., 2008; Hicks & Doolittle, 2008). Research exploring the prevalence, use, and value of educational technology in social studies curricular contexts generally, and inquiry-based instruction specifically, has indicated varied applications.

The gap between that which teachers value in utilizing educational technology and their actual instructional practices reveals notable curricular factors. Research exploring teachers' conceptions of student abilities concluded that perceived curriculum constraints, in terms of the breadth of content and limited time to explore it, limit social studies teachers use of digital primary sources even though the teachers perceive instructional value in their use (Friedman, 2009). Au (2009) detailed similar curricular influences and asserts high-stakes testing narrows social studies curriculum and causes teachers to alter classroom practices towards the most utilitarian or didactic approaches in efforts to quickly address content facts needed for passing an end of course test. However, this phenomenon is context-bound in that the teachers referenced in both studies operated in standardized environments with varying amounts of agency over their teaching practices. Agency, or freedom and authority to make key curricular-instructional decisions, varies across teaching contexts and is often perceived as constrained in highly standardized curricular environments. In contrast, Grant and Gradwell (2005) reported that teachers in their case study felt a strong sense of agency or empowerment when making curricular and pedagogical decisions, even when operating within high-stakes testing curricular contexts. This dichotomy highlights the importance of exploring the potential relationships between teaching contexts and instructional decisions. Curricular aspects of contexts are clearly significant in this exploration (Au, 2007). Similarly, the varied influences of interpersonal contextual factors reveal significant complexities.

***Interpersonal contextual factors.*** Relationships among stakeholders, educational professionals, authority figures, and students are key aspects defining interpersonal contextual factors. Specifically, Lutnpe and Chambers (2001) discussed professional



development, administrative support, parental support, and teacher support as important aspects of interpersonal contextual factors related to teacher beliefs about technology use. Teachers' relationships with school leadership personnel influences their teaching context due to the varying levels of support and instructional expectations (Ertmer et al., 2012). Rigby (2015) concluded that administrators in her six-person case study contributed to unique building-level conditions of instructional leadership as they affected instructional change through evaluations and setting expectations. Beyond administrative relationships, teachers' interpersonal contexts are further defined by collegial interactions.

A study of twelve exemplary technology-using teachers pointed to teacher beliefs and collegiality as important interpersonal factors shaping teachers' contexts (Glassett, 2007). Similarly, Liu, Tsai, and Huang's (2015) qualitative analysis of collegial relationships structured by a mentoring program found that mentor relationships influenced the teaching context and technology related decisions of the mentor and mentee. Study participants tended to carefully and deliberately plan engaging opportunities for technology use in the classroom. Most recently, Rosenberg and Koehler (2015) presented teachers and students as the two key actors within their framework for exploring context when considering the use of educational technology. In all of these examples, interpersonal relationships helped describe and define the context surrounding teachers. However, beyond these relational interpersonal factors are factors that reflect and define the social culture, or character, of teaching contexts.

Several researchers support the construct of student/teacher interactions or other social processes as core to shaping the interpersonal teaching context. In a review of

technology adoption processes, Straub (2009) declared, “just as the context can influence the beliefs and emotional response [of people], emotions may influence beliefs, context, and culture” (p. 642). Craig (2009) reported that teachers’ interactions with students are the most significant contributors to the lived, or day-to-day, curriculum. In essence, a unique interpersonal context, built upon shared values, develops in every classroom or micro-context. Such social aspects of micro-contexts in general, and educational technology environments specifically, are dynamic and critically important to learners’ social identities because they inform learners’ expectations for engaging in the learning process (Li, 2013). Selwyn (2010) argued that a deeper exploration of the dynamic social processes that underpin classroom environments provides a better understanding of educational contexts than merely focusing on singular processes, such the use of computers. Accordingly, socio-cultural factors are key to understanding values within teaching contexts and, in turn, the influence of interpersonal contextual factors on teachers’ decisions.

Interpersonal contextual factors intersect with teachers’ knowledge about their students and how best to interact with them. These factors are further discussed later in this chapter in terms of knowledge about students informing teachers’ instructional decisions. However, more closely related aspects of context are the organizational contextual factors. Personnel and the policies that bind them together point to organizational factors that further shape context.

***Organizational contextual factors.*** Factors related to the educational institution or organization itself and the associated norms and preferences constitute significant pathways to understanding the teaching context (Debele & Plevyak, 2012; Ertmer &

Ottenbreit-Leftwich, 2010). Lawrence and Lentle-Keenan (2013) offered particular insight as they pointed to institutional constraints that undergird teaching decisions. Their case study of six teachers revealed institutional constraints, such as central office priorities and teacher workload, are considered more important than teachers' instructional preferences when exploring technology use in the teaching context. These aspects are part of the organizational context that characterizes educational institutions and can have tangible negative or positive effects on classroom technology implementation (Garrison & Bromley, 2004). The organizational culture that develops within educational institutions shapes the norms and preferences of that institution.

Organizational priorities and expectations of teachers contribute to teaching contexts. Saye and Brush (2009) reported that an institutional context in which new or different ideas are embraced led to better leveraging of technological affordances. Conversely, Bodman, Taylor, and Morris (2012) argued that institutional priorities might not always be congruent with teachers' perspectives, which could lead to limited pedagogical agency. Their report on the decision-making context for teachers magnifies the need for teacher involvement in setting school and instructional priorities within the organization. The interplay of leadership, curriculum, time, and resources characterize the dynamic organizational context in which teachers work (Garrison & Bromley, 2004). The technological infrastructure, and the personnel who define it, fit well as important aspects of the teaching context and related organizational factors (Debele & Plevyak, 2012; Saye & Brush, 2009). However, each of the organizational contextual factors discussed here have a commonality central to their description: they converge in the classroom and have potentially significant influence on classroom happenings.

**The resulting classroom context.** The classroom as defined by the convergence of contextual factors is central to any discussion or exploration of the teaching context. The classroom envelops context in both of Rosenberg and Koehler's (2015) definitions of context as *that which surrounds* and *that which is woven together*. Thornton's (2005) conceptual frame made the strong assertion that nearly all aspects of teaching and learning come down to the decisions of the classroom teacher and his or her role as the curricular-instructional gatekeeper, despite the organizational and policy factors that teachers follow. It is in the classroom that contextual factors converge, making it the focal point of the teaching context. Thornton's perspective is echoed in related research on curriculum enactment in the classroom. Craig (2004) argued that teacher agency is key to understanding the changing instructional context. Teachers operate in a micro-culture of the classroom, as defined by student/teacher interactions, which makes it a complex yet crucial environment for understanding teachers' decisions (Rosenberg & Koehler, 2015; Selwyn, 2011a). Accordingly, Perfecto (2012) described the daily instruction, planning, and implementation of the curriculum as central to teacher actions. As teachers perceive the context of their daily instruction and classroom practices, their decisions reveal contextual considerations that merit further exploration.

As curricular-instructional gatekeepers and daily decision-makers, social studies teachers are actively involved in the construction of knowledge in a traditionally subjective content area (Thornton, 2005). Curriculum enactment often falls solely on the teacher and is subject to the teacher's perceptions of the learners and the appropriate pedagogical aims (Manfra & Hammond, 2007). Balancing the many responsibilities and demands of a classroom has created a constraining environment in which teachers

navigate the many factors involved in gatekeeping curriculum and managing classroom responsibilities. Pace (2011) referred to this balance as the curriculum “squeeze” (p. 34). Perfecto (2012) characterized the same phenomenon as balancing demands, while Selwyn (2011) used the phrase “managerial pressures” (p. 93). All of these descriptions allude to the daily challenges faced by many teachers as they navigate the many happenings of their classrooms. A useful construct to frame the competing challenges of the classroom is that of the contested classroom space (Craig, 2009).

*The classroom as a contested space.* The classroom is a convergence of competing contextual factors that occupy the instructional “space” (Craig, 2009). This figurative space is shaped by the many outside influences that constrain teacher agency and limit that which Craig terms the “lived-curriculum,” which develops through natural teacher/student interactions (Craig, 2004, 2009). A similar construct, though mainly used to describe instruction, is developed in Manfra and Hammond’s (2007) description of curriculum planned versus curriculum enacted in high school social studies. In their view, participants in the case study of two social studies classrooms experienced some tension between the prescribed or mandated curriculum and their instructional decisions. Their classroom space was contested due to intended curriculum being filtered through divergent pedagogical aims and preconceived notions of the content. The tension between curriculum requirements and day-to-day instruction is further illustrated in literature describing the constraints on teachers’ actions.

The classroom space is contested by competing demands of education policy reforms, standardized curriculum, and instructional time as related to high takes testing (Craig, 2009). Hardy’s (2013) case study of two teachers’ working contexts focused on

contesting characteristics such as regimented curricula and mandated tests. Hardy concluded that top-down policy efforts might narrow teachers' pedagogical actions and inhibit a rich educational experience. In similar research, a case study of two high school teachers planning in a contested context revealed that the prescribed curriculum limited the range of pedagogical possibilities, which allowed for teachers to favor routine instructional practices that fit well with the demands of the curriculum (Perfecto, 2012). In a content-specific example, Journell's (2010) study of the contested classroom space in several secondary social studies classes concluded that teachers felt some instructional limitations due to high-stakes testing and related pressures. Policy-level bureaucratic decisions in concert with school and classroom demands can contest classroom space and potentially limit teacher agency (Grant & Salinas, 2008; Sedivy-Benton & McGill, 2012).

Common to all of these studies is the description of tension between teachers' agency in instruction and the directed parameters within which teachers work. According to Craig (2009), such tension limits the classroom instructional "space" available for teachers' instructional decisions. The contextual influences that contest the space are noted on multiple levels of educational governance, including building, district, and statewide policies or procedures. Distinct from the curricular, interpersonal, and organizational factors described above, these layers surround the micro-context of the classroom and carry potentially significant influences.

Research has not described just how much various context factors contest individual classroom space. A thorough description of the contextual levels encompassing these factors, as defined in current research, allows for a fuller exploration. Specifically, examining contextual layers is a useful pathway to better understanding the

interplay of contextual factors and the contested classroom space as related to educational technology use.

**Contextual layers.** Several researchers have defined contextual layers in terms of influences on educational technology use. Selwyn (2011) termed these layers as macro, intermediate or meso, and micro. Porras-Hernandez and Salinas-Amescua (2013) used the same terms to describe the context within which teachers make technology related decisions. In both cases, the macro level refers to larger social, political, or economic conditions of the state (or nation) that shape norms as well as policies. The meso, or intermediate, level refers to the structures of the local community, namely the school system or individual schools and those who administer such organizations. Finally, the micro level is described as the convergence of in-class conditions, including those of teacher decisions and responsibilities. Rosenberg and Koelher (2015) theorized that the micro level of context is further characterized by the actions or knowledge of teachers and students as key factors that define context. The interplay between these levels and the related effects on context is not easily defined.

Given the nested organization of educational structures, some elements of context, such as curriculum development, can exist on more than one layer (Selwyn, 2011). Furthermore, social and political influences exist on each layer that relate specifically to educational technology use (Molebash et al., 2009; Selwyn, 2011). Building on Porras-Hernandez and Salinas-Amescua's (2013) layered model, Rosenberg and Koehler (2015) advanced a conceptual framework for studying context on the micro-level by focusing on the role and knowledge of teachers and students as central actors in a classroom context where technology is used. Viewing the relevant literature on context through the lens of

macro, meso, and micro layers provides a useful conceptualization of how specific classroom spaces can be contested and potentially influence teachers' instructional decisions.

***The macro-contextual layer.*** Elements of the macro level that frame the social studies teaching context include high stakes testing and the prescribed curriculum as dictated by state educational agencies. For example, Craig (2004) described high stakes testing as significantly changing the instructional context and the teacher agency within that context. Teachers operate in contexts that influence their agency to varying levels of perceived satisfaction (Grant & Gradwell, 2005). Au (2007) and Journell (2010) both concluded that high-stakes testing constrains teachers' willingness to incorporate instructional methods or resources that are not directly related to the essential knowledge for the test. Journell (2010) described these constraints as resulting in a "curriculum-first" approach to the content (p. 116). Similarly, Au's (2007) interpretation of a metasynthesis on social studies curriculum control revealed social studies curriculum has been narrowed and pedagogy leans towards teacher-centered instruction. It is, therefore, likely that macro level influences translate into contested classroom level realities, which limits teachers' ability to fully embrace alternate pedagogical aims such as inquiry or the use of digital media. The same is true for the meso layer of context.

***The meso-contextual layer.*** Elements of the meso or intermediate level of context include system-wide or building level interpersonal and technological factors, school culture and instructional norms, and infrastructure issues related to the instructional process. Lutnpe and Chambers (2001) included building level elements such as resources, Internet access, planning time, and class size in their list of 14 factors that influence



teachers' decisions regarding technology integration. Savage's (2012) multiple case study of teachers' cross-curricular pedagogical decisions illustrated the meso level of context to be a recursive process in that school-level contexts reflect school authorities' content preferences and foci. Savage's research was built upon Jephcote and Davies's (2007) original conception of levels of change, which identified the meso-contextual layer as comprising "subject associations, local education authorities and sponsored curriculum projects where there are mediating processes which provide means to reinterpret macro-level changes" (p. 208). These views reinforce the conception of context as a layered construct in which multiple influences exist.

To achieve a context-rich analysis of educational technology use, the meso level of institutional processes and procedures must be considered (Selwyn, 2010). Though these elements are shaped by district-level priorities that influence the larger school setting, very little empirical research addresses this layer in terms management priorities or system changes as related to educational technology (Fulmer, Lee, & Tan, 2015; Latchem, 2014). However, general examinations of the meso-contextual layer reveal connections between district and school level priorities in terms of leadership and the socio-cultural setting of a school (Rigby, 2015). Garrison and Bromley's (2004) examination of social contexts in education pointed to the intricacies of meso level concerns in declaring,

At all levels, whether it's teachers requiring evidence of student productivity, schools requiring evidence of teacher effectiveness, or state requirements for higher test scores, efforts to cope with demands for accountability end up

interfering with the actual accomplishment of what is putatively being demanded.  
(p. 607)

Such reciprocal demands characterize the culture formed out of the meso-contextual layer as administrators and teachers react to local policy and high expectations.

School culture as formed through interpersonal relationships, teaching expectations, and established routines reflects the socio-cultural setting of the school and the contextual opportunity for learning in a technology-rich environment (Angers & Machtmes, 2005). Lawrence and Lentle-Keenan (2013) discussed related conclusions by describing institutional constraints and organizational preferences as influential aspects of teacher use and perceptions of web-based educational tools. Similarly, school culture and instructional norms are the immediate context of instructional choices and routinized teaching that shape the day-to-day habits of teachers. (Ertmer & Ottenbreit-Leftwich, 2010). The instructional space is further contested by these competing meso factors that interact to form a unique educational environment in every classroom. From here, the classroom, or micro level of context, is perhaps the most complex layer.

***The micro-contextual layer.*** Elements of the micro level of context are numerous as they are the classroom factors “that reciprocally affect teachers and their practice” (Rosenberg & Koehler, 2015, p. 465). The classroom curriculum guides the educational interactions of teachers and students through prescribed content standards and the resulting teaching and learning activities (Craig, 2009). The resources utilized in daily instruction in combination with the teacher’s goals help inform instructional decisions according to the needs of the class (Thornton, 2005). In terms of technology use, the day-to-day and minute-by-minute instructional decisions made by teachers exist within the

micro level context in which teachers are required to balance their beliefs with their unique educational environment (Selwyn, 2011). It is at this level that the classroom space is most noticeably contested as teachers weigh curricular expectations with other contextual influences that effectively limit the teacher-student interactions that Craig (2009) emphasized as the valuable “lived” curriculum. Perfecto (2012) effectively described this delicate balance for teachers as one that requires consideration of the prescribed curriculum as well as the realities of the classroom.

The micro-contextual layer encompasses the classroom and the resources necessary to sustain classroom activities. These resources are an intricate part of the learning experience as they include characteristics such as materials, social interactions, individual needs, and teaching processes (Selwyn, 2010). Elements of the micro-context are not easily or exhaustively delineated because they are intertwined with the educational system of which they are a part. Herein lies the importance of identifying the micro-contextual layer as an avenue of exploration and inquiry. It is at this level that researchers can unpack the social interactions of teaching and learning while deeply exploring complex classroom experiences (Li, 2013; Selwyn, 2010).

The result of this complex teaching context is instructional decision-making that heavily relies on day-to-day happenings in the classroom as well as pedagogical possibilities that exist given the perceived contextual influences. Therefore, the teacher as the instructional-curricular gatekeeper and his/her decisions in the complex context of the contested classroom space should be more fully explored in order to understand teachers’ decisions regarding the use of educational technology.

## **Instructional Decision-Making in the Teaching Context**

Instructional decisions in the teaching context are influenced by various forms of teachers' knowledge, their beliefs, and institutional factors. Decisions about the use of educational technology are further influenced by specific gatekeeping aspects of the classroom teacher. According to Perfecto's (2012) application of the Woods (1996) model for teachers' planning decisions, instructional planning is characterized by recursive phases of structuring, mapping, and assessing course content and activities. Perfecto noted that teachers' in contemporary classrooms do not structure curriculum independently due to the prescribed curriculum standards mandated by their institutions. However, Perfecto suggested that varied circumstances and unique teacher viewpoints influence mapping and assessing processes. Extant literature related to teachers' instructional decisions, including specific technology integration decisions, points to multiple extrinsic and intrinsic influences on teachers' actions. The following four categories of decision-making influences are derived from a synthesis of related literature on decision-making processes and constructs.

**Institutional and instructional norms.** The organizational/institutional context, within which teachers make decisions, significantly contributes to what is taught and how it is presented. Institutional and instructional norms, or the values, beliefs and practices existing in a teaching context, inform the gatekeeping process (Tally, 2007; Thornton, 2005). Instructional decision-making is carried out, in part, by considering the norms related to classroom context and its affordances and constraints (Darling-Hammond & Baratz-Snowden, 2007; Wojcik et al., 2013). Collegial relationships, knowledge about the student population, teacher beliefs, and school level instructional routines contribute

to the unique instructional culture established at educational institutions (Mumba, Mbewe, Sasser, Chabalengula, & Wilson-Miles, 2009; van Hover & Pierce, 2006).

Given the unique nature of social studies content and the subjective and personal interpretations that often accompany social studies instruction, institutional norms play an important role in teachers' instructional decisions. Van Hover and Pierce (2006) studied first year history teachers' decision making with specific attention to prescribed curriculum standards and related pass rates on end of year tests. The authors point to the various roles and responsibilities, such as high-stakes testing preparation and administrative duties, placed upon teachers as significant influences on participants' instructional decisions. Furthermore, the norms and expectations of the school and district led to content specific challenges of teaching social studies, including rectifying deeply held beliefs on the subject matter and how best to teach it. Lofty expectations, curricular challenges, and excessive workloads are common in schools and often factor into teachers' decision-making process (Grant & Gradwell, 2005; Mumba et al., 2009). Accordingly, teachers' knowledge, pedagogical beliefs, and institutional context are important factors at play within instructional decisions.

**Teacher knowledge concerning technology, pedagogy, and content.** Teachers' knowledge and understanding of students and how best to teach them the content is a key component of instructional decision making (Au, 2007; Perfecto, 2012). This is especially true in relation to the use of educational technology as teachers make decisions on how technology is integrated into existing or familiar pedagogy while striving for technology-enabled learning for authentic pedagogy (Ertmer & Ottenbreit-Leftwich, 2013). The various aspects of teacher knowledge intersect as daily instructional decisions

are made. Deciding on educational technology use adds another layer to this process due to the breadth of available technology tools (Starkey, 2010). Moreover, technology uses in social studies exemplify the availability of unique content area applications. Both generalist, common technologies that can be used in many different content areas, and specialist technologies, those that are helpful in learning social studies concepts specifically, signify important areas of teacher knowledge (Friedman, Bolick, Berson, & Porfeli, 2009). Mishra and Koehler's (2006) construct for understanding the complex knowledge needed for educational technology integration is a useful framework for organizing the various aspects of teacher knowledge present in the decision making process.

***Technological pedagogical content knowledge (TPACK).*** Mishra and Koehler (2006) describe technological pedagogical content knowledge (TPACK) as a framework for exploring teacher knowledge and the relationship to technology integration. More specifically, the idea of teaching and the decisions made as part of the educational process are explained as a complex process that draws from several interrelated domains of teacher knowledge. Mishra and Koehler built this framework on the basis of Shulman's (1986) notion of pedagogical content knowledge, or PCK. Pedagogical content knowledge is described as "subject matter knowledge for teaching" (p. 9). Similarly, TPACK is the complex knowledge relied upon for integrating technology in the classroom. Mishra and Koehler described this knowledge as co-constraining to one another in that technology, pedagogy, and content knowledge are interrelated. Recent research applying TPACK to social studies education confirms the complex relationship of teacher knowledge and instructional decisions.

Teacher knowledge of technology integration pathways and related decisions is important in specific social studies content areas. Swan and Hofer (2011) highlighted the usefulness of TPACK as a pathway to gain insight into the planning decisions and instructional implications of teachers using technology while teaching economics. The authors pointed to evidence for strong technological pedagogical knowledge (TPK) but weaker technological content knowledge (TCK). A reason for this difference is the lack of knowledge for content specific technologies resulting in the application of more universal, or generalist, technology resources. This study is reflective of earlier research by Manfra and Hammond (2007) that noted a stronger sense of pedagogical knowledge (PK) rather than TPK or TCK in teachers who utilized student produced digital documentaries. A related study of social studies methods courses illustrated the significance of developing knowledge of specialist technology tools in order for teachers to successfully combine content and technology in instructional decisions (Byker, 2014).

Consistent research on PCK as a leading aspect of teacher knowledge utilized in decision-making provides insight into current examples of technology integration in social studies (e.g., Manfra & Hammond, 2007; Segall, 2004a). Hammond and Manfra (2009) asserted that PCK is an important indicator of teachers' decisions and pedagogical aims in their utilization of constructivist instructional methods in social studies. Taking a broader approach, Harris and Hofer (2011) discussed consideration of learning activity types to help guide teachers' decisions on educational technology options in their unique teaching contexts. They argued: "To effectively integrate educational technologies into instruction, K–12 teachers' planning must occur at the nexus of curriculum requirements, students' learning needs, available technologies' affordances and constraints, and the

realities of school and classroom contexts” (p. 211). Each of these aspects relates to teacher knowledge in general, and PCK and TCK in particular.

Though TPACK is useful in delineating the complex convergence of types of teacher knowledge, it does not fully capture the decision making process in unique teaching contexts. Brantley-Dias and Ertmer (2013) argued that TPACK is somewhat insufficient due to the over-complexity of defining and utilizing the model. They asserted that a better approach is to focus on PCK in the teaching context in order to help teachers understand and experience educational technologies useful to unique classroom environments. This criticism does not necessarily detract from TPACK as a model for understanding teacher knowledge, but it does help capture other research approaches that highlight teachers shaping their technology use around preconceived pedagogical aims (Manfra & Hammond, 2007; Wozney et al., 2006; Yow & Swan, 2009). Consideration of teacher beliefs and related knowledge concerning their students’ learning addresses the balance between teacher pedagogical aims and their enacted instruction. Gatekeeping actions of social studies teachers rest partially on this balance.

**Teacher knowledge and beliefs about students.** Shulman’s (1986) conception of pedagogy as part PCK includes knowledge of students and their learning needs. According to Shulman, teachers require knowledge of how best to “reorganize the understanding of learners” (p. 10) because learners have unique combinations of prior knowledge. More recent research has built upon this premise to include a more holistic understanding of learners, their goals, and their abilities (Clough, Berg, & Olson, 2009). In essence, this focus has produced a largely student-centered view of teacher beliefs regarding instruction. Griffith, Massey, and Atkinson (2013) identified student-centered



beliefs as one of three main external forces that guide teacher decision-making. Based on Bransford, Darling-Hammond, and LePage's (2005) framework for teacher learning, which highlights teacher knowledge development, Griffith et al. (2013) argued that teachers who adopt student-centered methods adjust their teaching based on students' reactions, successes, and failures. This closely aligns with similar research regarding the importance of teachers' choices and beliefs, including teachers' sense of students' interests and abilities, in secondary social studies (Grant & Gradwell, 2005).

Perceptions of students' abilities, especially within a mandated curriculum context, may constrain teachers' willingness to implement strategies requiring higher-order thinking using technology resources in secondary social studies classes (DeWitt, 2007; Friedman, 2009). The social context of a classroom, in terms of culture and socioeconomic status (SES) of most students, further influences teachers' knowledge and beliefs about their students. In turn, such influences have tangible effects on technology related instructional decisions. For example, Song and Owens's (2011) report on results from a national survey on teacher preparation for technology integration concluded that teachers in low SES schools receive less professional development on technology use than teachers in higher SES environments, which may decrease effective technology integration. Though SES is well documented as a reliable predictor of academic achievement and perceived student abilities related to high stakes testing (Tindle, 2012), the use of educational technology to promote successful engagement in low SES contexts is present in the literature (Zammit, 2011).

DeWitt (2007) studied the variations in teaching contexts resulting from social class and SES. He reported that teachers' instructional practices as well as their views on

student potential differed from lower to higher SES teaching contexts. Specifically, DeWitt noted that high and low SES environments included computer use as a regular part of instruction, but students from high SES backgrounds often used computers to deepen or extend understanding rather than simply referencing information on the Internet. Teachers' knowledge and beliefs about their students' SES, whether favorable or unfavorable, influence their instructional decision-making. Together with decisions related to mandated curriculum and high stakes test preparation, teachers' perceptions of students' abilities intersects with technology integration efforts.

Contexts shaped by mandated curriculum and accountability often include high stakes testing in secondary courses. Teachers' knowledge and beliefs about students' abilities to perform well on these tests influence their instructional decisions (Pace, 2011; Warschauer et al., 2004). Though data from high stakes tests contribute to teacher knowledge and beliefs about students' abilities, research reveals seemingly conflicting views on the extent to which high stakes testing data inform teachers' instructional decision-making. Grant and Gradwell (2005) pointed to disparate teacher views of test data as a driver of instructional decisions. Participants in their study viewed high-stakes testing and the resulting data as a relatively minor consideration when designing instruction. Some researchers advocate utilizing multiple data sources, such as classroom data, student performance, and input from collaborating teachers to inform instructional decisions (Mokhtari, Rosemary, & Edwards, 2007). Conversely, Ediger (2010) favored using, nearly exclusively, pre and post test data to inform teacher decisions in social studies. However, much of the research on data driven decision-making allows for or recommends additional data beyond standardized tests to more fully inform teachers'

knowledge of student learning. Specifically, exploring teacher beliefs concerning content and pedagogy is useful for a deeper understanding of instructional decision making in the teaching context.

**Teacher beliefs concerning content and pedagogy.** Similar to Thornton's (2005) gatekeeper concept discussed above, Pace (2011) concluded that teachers' personal beliefs about content and pedagogy serve as filters of the curriculum as well as the instructional purposes for their methods. Other researchers have clearly positioned pedagogical beliefs as the primary driver of instruction, even beyond the admitted curricular constraints of a mandated curriculum (Manfra & Hammond, 2007). Routinized pedagogical practices and instructional norms, often employed to simplify the planning process, can serve to reinforce teacher beliefs about how best to teach the content, especially in the often-debated content area of social studies (Angers & Machtmes, 2005; Harris & Hofer, 2011). Darling-Hammond and Rustique-Forrester (2005) noted similar effects in other content areas and point to a narrowed or constrained curriculum as helping shape teacher instructional routines and conceptions. Furthermore, personal conceptions on how important the content is in relation to prescribed pacing and curricular guides influences how some content is presented (van Hover & Pierce, 2006).

As educational professionals, teachers are active decision-makers rather than passive agents of educational policy (Pace, 2011; Sloan, 2006). Griffith and colleagues (2013) characterized teachers' reflexive thinking regarding their own beliefs and the curricular context as part of the professional spirit relied upon to "skillfully balance the curriculum and the required standards with individual students' needs" (p. 319). The balance described here is part of a larger sense of professionalism concerning how best to

encounter content and pedagogy. Variance of opinion and background in social studies yields content specific challenges such as personal beliefs on the subject matter and how best to present it (van Hover & Pierce, 2006). A thorough knowledge of the content area and related pedagogical beliefs are clearly important aspects of decision making in social studies education (Segall, 2004b). However, the intersection of environment, knowledge, and beliefs regarding technology in the classroom space returns us to Thornton's (2005) gatekeeping construct for exploring teachers' decisions.

### **Conclusion: Teacher Gatekeeping Decisions Regarding Educational Technology in the Classroom Space**

The use of educational technology, and the related beliefs of teachers, can add further complications to teachers' instructional decision making in the context of a contested classroom space. Fitchett and Vanfossen (2013) asserted, "teachers' beliefs and the context of their lived and work experience influence instructional decision-making" (p. 1). Considering the lived experiences of social studies teachers in context reveals various forms of gatekeeping regarding educational technology. Angers and Machtmes (2005) identified key differences in exemplary versus non-exemplary educational technology using teachers. Specifically, they noted that exemplary use of technology in social studies is not widespread because such use is based mostly on teachers' attitudes and beliefs about the utility of technology tools. This not only leads to a call for more collaboration and professional development concerning technology, but highlights the critical need for developing teaching contexts conducive to broadening instructional approaches as well. Moreover, specific attempts to raise awareness of educational

technology tools and resources relevant to instructional design and planning should consider aspects of teacher knowledge and instructional goals (Harris & Hofer, 2011).

Instructional goals balanced with external influences, such as curriculum constraints and time limitations, typify gatekeeping in many educational environments (Chen et al., 2009; Friedman, 2009). Similarly, school culture and routinized teaching practices influence typical educational technology decisions that must be balanced with teachers' pedagogical beliefs (Ertmer & Ottenbreit-Leftwich, 2010; Glassett, 2007; Saye & Brush, 2009). As a result, teachers are encountering a contested classroom space in a complex teaching context within which institutional constraints can often conflict with the perceived value of educational technology and/or teachers' willingness to incorporate technology tools (Lawrence & Lentle-Keenan, 2013; Wozney et al., 2006). Technology gatekeeping decisions are bound by context and the perceptions of classroom teachers. According to Bodman et al. (2012), "if decision-making lies at the policy level rather than the classroom level, teachers may feel less, not more responsible for outcomes. They have neither autonomy nor responsibility" (p. 22). The context of gatekeeping is contested by competing external interests and micro-layer realities.

Teachers' personal beliefs about content, pedagogy, and the value of technology influence day-to-day instructional practices and gatekeeping, but teachers are additionally influenced by external factors that affect decision-making. Herein lies the key element for exploring instructional decisions in the gap between research-based practices and the enacted curriculum: that of the teaching context.

Understanding this interaction of teacher beliefs and knowledge, experiences, and context is a challenge in any content area, but it is especially challenging in social studies

due to the subjective and often debated nature of the field combined with the varying effects of high-stakes testing (Journell, 2010; Pace, 2011). Additionally, the various opinions on the value and/or necessity of utilizing educational technologies in secondary social studies present a paradox in that most scholars favor technology use in secondary social studies while simultaneously recognizing its underutilization (Angers & Machtmes, 2005; Friedman, 2009; Swan & Hofer, 2008; Yow & Swan, 2009). Teachers who strive for student-centered constructivist learning through inquiry in social studies can benefit from educational technologies that present possibilities for greater access to materials and methods of student engagement (Bull et al., 2008). Whether or not social studies teachers decide to use technology in their given context, and why those decisions are made, is an area in need of careful research.

Further exploration of the teaching context is necessary to better understand how secondary social studies teachers make decisions regarding educational technology. Given the complex nature of the teaching context and layered organization of contextual levels, exploring the classroom teacher as an instructional gatekeeper acting within a contested classroom space may yield important findings regarding influences on instructional decisions. Such complexity magnifies the need to analyze contextual influences in terms of how teachers navigate instructional contexts and how they mediate technology-related decisions based on their agency. Nardi and O'Day's (1999) Information Ecologies Framework, discussed in Chapter 3, encompasses the contextual and human factors involved in making technology-related decisions as part of system. Exploring teachers' contexts as unique systems in which the interrelated contextual

factors both influence and are influenced by teachers will enhance our understanding of contextual influences.

The study methods detailed in the next chapter provide one pathway of inquiry for better understanding the complex intersection of educational technology in social studies, contextual considerations, and teachers' instructional decision-making. With the goal of exploring particular contexts as unique information ecologies, this study contributes to the literature base on educational technology use while establishing a thorough perspective on the teaching context as an important instructional factor in secondary social studies.

### **Chapter 3: Methodology**

I employed qualitative research methods to explore aspects of teaching contexts and instructional decision-making. According to Merriam (1998), important characteristics of qualitative research include “the goal of eliciting understanding and meaning, the researcher as primary instrument of data collection and analysis, the use of fieldwork, an inductive orientation to analysis, and findings that are richly descriptive” (p. 11). Stake (2010) adds that qualitative research “relies primarily on human perception and understanding” (p. 11). Qualitative methods, therefore, offer an appropriate pathway to elicit better understanding of teachers’ perceptions of contextual influences on instructional decision-making. Accordingly, I utilized interviews, observations, and artifact analysis to address the following research questions:

How, if at all, does context influence social studies teachers’ classroom use of educational technology? Specifically,

- a. How do teachers perceive the influence of interpersonal, institutional, and curricular context factors on their instructional decision-making regarding technology use?
- b. How, if at all, do teachers perceive contextual factors as contesting the classroom space in which technology related instructional decisions are made?



## **Theoretical Framework**

This study explored the contextual influences of social studies teachers' instructional decision-making regarding educational technology. Given the complexity of teachers' school and classroom contexts, detailed in previous chapters, I used the use of the Information Ecologies framework for exploring and analyzing "local habitations" as described by Nardi and O'Day (1999). Local habitations are the settings in which technologies exist among a network of human relationships. At its core, the Information Ecologies framework focuses on the human element of technology integration in a particular setting. As such, it embraces the previously discussed concepts of gatekeeping (Thornton, 2005) and contested classroom space (Craig, 2009). A sense of teacher values and agency permeates the concept of information ecologies in that humans are systemically tied to how technology is used. According to Nardi and O'Day, there is "a sense of urgency about the need to take control of our information ecologies, to inject our own values and needs into them so that we are not overwhelmed by some of our technological tools" (p. 56). The control, or decision-making, involved with technology is best understood when considered through a framework that is comprehensive in approach and systematic in analysis.

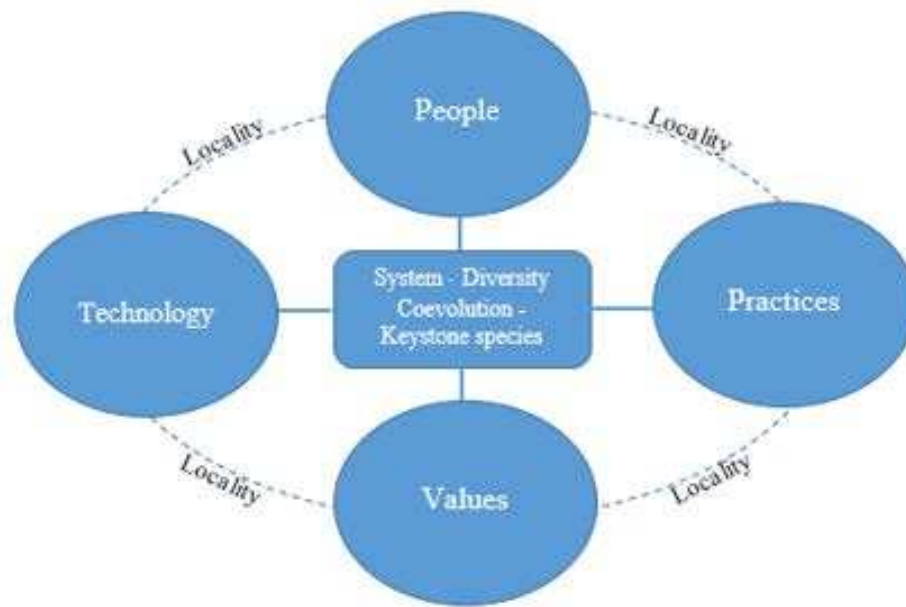
From a broad anthropological view, "information ecology is the study of the relationship of environmental information (at least physical, biological, social, and cultural environments) to all that comprises collective and individual processes of knowing and decision making (ideology, values, expectations, beliefs, symbolism)" (Stepp, 1999). Nardi and O'Day (1999) applied this idea more narrowly as a metaphor for how technology is utilized in a defined context. Specifically, Nardi and O'Day (1999)

presented information ecologies as a comprehensive approach to exploring the influence of technology in a way that “emphasizes local connections and offers scope for diverse reflections and analyses” (p. x). Subsequent uses of this approach validate Information Ecologies as a useful research framework for data generation and analysis (e.g., O’Day, 2000; Perrault, 2007; Steinerova, 2012).

**Overview of information ecologies.** Information ecologies are systems of “people, practices, values, and technologies in a particular local environment” (Nardi & O’Day, 1999, p. 49). The Information Ecologies framework emphasizes human activities that involve technologies rather than focusing on technology in isolation. The construct of *ecology* captures the interrelated aspects of local habitats. In contrast with terms such as *community* or *setting*, ecology implies a sense of diversity and continual evolution. A biological ecology, for example, has multiple members that are very different yet they contribute to the same system. An oak tree, a woodpecker, and a fern are all different members of the same forest ecology. When considering technology use, people, practices, and technology tools and resources are unique aspects that form an interrelated system, or information ecology. According to Nardi and O’Day, information ecologies are complex, scaled to individuals, comprised of relationships, and continually evolving. However, to better understand a particular information ecology, one must consider the organizing properties that characterize each ecology.

Nardi and O’Day (1999) argued that information ecologies, like biological ecologies, are characterized by complex systems, diversity, coevolution, the presence of keystone species, and sense of locality. Complex systems indicate the interrelated and interdependent aspects of an ecology because change that takes place is systemic and will

influence the whole ecology. Diversity in an information ecology includes the various kinds of people and tools that exist in a particular habitat that complement each other and prevent a monoculture that lacks depth. Similarly, coevolution in an information ecology is characterized by the adaptations needed for a system to adjust and grow healthier. Finally, keystone species are those people or groups that are necessary for the survival of an information ecology because they offer important skills and mediate difficult circumstances. A sense of locality binds these characteristics together as local circumstances define the role and purpose of technologies. As illustrated in Figure 2, there is interplay of these characteristics within a system of people, practices, values, and technology. Given the variance between local habitats, information ecologies are best understood on the micro-level where local members immersed in the ecology have knowledge and authority to assign value to technology tools and resources. The Information Ecologies framework provides needed structure and an analytical vantage point for better understanding practices and procedures of a local habitat, or specific information ecology, in terms of people, practices, values, and technologies.



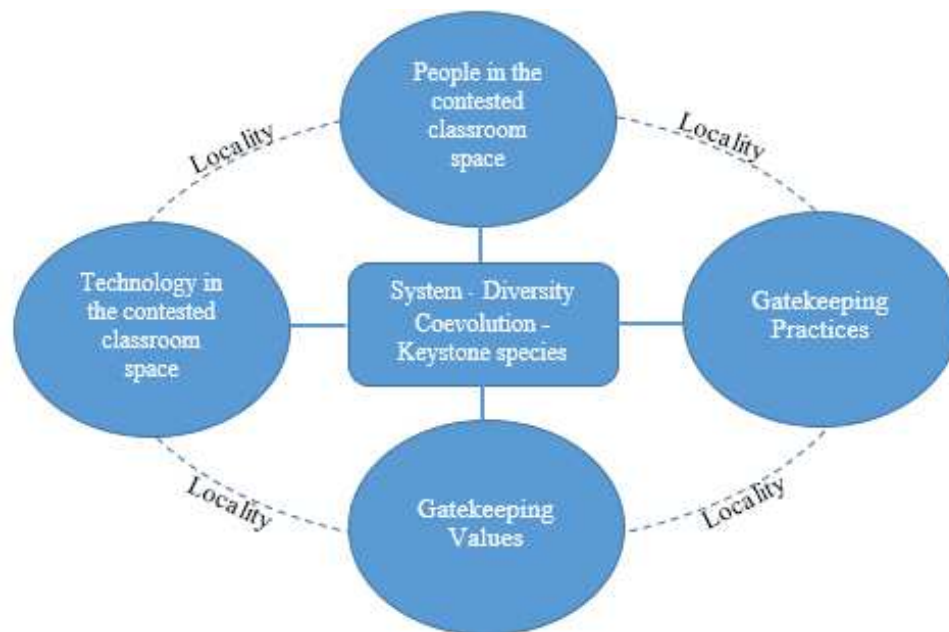
*Figure 2.* Model of the Information Ecologies framework. Based on Nardi and O'Day's (1999) conceptualization.

Therefore, locality is key to exploring information ecologies. An information ecology develops unique system characteristics, diverse entities, coevolution of members, and keystone species distinct from other localities.

Information ecologies are relational, unique, and best understood by members of the ecology. Technology tools and resources are just one part of a complex ecological whole. Information ecologies are not simply understood as being technocentric or, alternatively, technophobic. Modern information ecologies most often involve technology, but the role of technology is neutral without the human mediation that assigns value and purpose. Nardi and O'Day (1999) described themselves as “critical friends of technology” (p. 14) who carefully observe functions of technology in local information ecologies and the related activities as mediated by human elements. As a result, they viewed technological tools through a lens of human intentionality,

accountability, judgment, and creativity. The Information Ecologies framework accounts for such human elements as part of a locality, or local context, and the various influences both within and from outside the ecology.

**Information ecologies and contextual influences.** The Information Ecologies framework provides an analytical structure for exploring the teaching context and the related influences on teachers' decision making regarding educational technology. This framework accounts for the varied contextual factors by focusing on people, practices, values, technology, and locality. The emphasis on human mediation and uniqueness of the environment strongly supports the conceptual lens of the teacher as a curricular-instructional gatekeeper (Thornton, 2005) operating within a contested classroom space (Craig, 2009) (see Figure 3).



*Figure 3.* The Information Ecologies framework through the conceptual lenses of contested classroom space (Craig, 2009) and curricular-instructional gatekeeping (Thornton, 2005)

*Technology* and *people* are key aspects of classroom space in terms of contextual factors that influence teacher decisions. Similarly, *values* and *practices* reflect the strong ideological influences on teachers' decision-making. The micro-context of the classroom binds these aspects together to form a unique sense of locality. Accounting for this complex structure ecologically gives each aspect of the teaching context relative weight and structure. Emphasizing the link between technology use and human mediation appropriately values teachers' perceptions as an avenue of inquiry. Therefore, the Information Ecologies framework was an appropriate framework for guiding this study of teacher's perceptions of contextual influences on instructional decision-making.

The first publication on information ecologies called for a valuing and understanding of information in an ecological manner and emphasized interpreting and managing *information* in terms of what works in context (Horton, 1978). The Information Ecologies framework used for this study emphasizes ecological qualities of *technology* use within a given context. Similar to Nardi and O'Day (1999), I leveraged this perspective by analyzing data in terms of people, practices, values, and technology as well as the resulting system, diversity, coevolution, and keystone species in a given locality. Furthermore, I viewed technologies in the teaching context as singular aspects in an interrelated information ecology. As a result, changes to information and technology use had particular as well as systemic influences. Through framing the unique cases of this study as information ecologies, I endeavored to better understand how context influences instructional decisions on the micro-level—that of the classroom—as mediated by the teacher and other members of the ecology. This effort, in part, answered Horton's (1978) call to "define and measure the quality of information" ecologically (p.

32). Though I focused on educational technology rather than information management, I approached the matter with similar deference to ecological complexity.

## **Design**

In this study, I explored the shared experience of instructional decision-making through the perceptions of different people. As such, I utilized a phenomenological approach to facilitate rigorous analysis of participants' individual and common experiences. According to Merriam (1998), phenomenologists put aside prior beliefs about a phenomenon in order to “depict the essence or basic structure” of experiences before interpreting the phenomenon (p. 16). I explored the experiences of instructional decision-making within individual information ecologies as well as evaluated these experiences across multiple cases.

Though a phenomenological approach framed this study, I utilized an interpretivist perspective when generating and analyzing data. Interpretivist researchers view reality as socially constructed and complex (Glesne, 2011). Accordingly, interpretivists seek to understand or describe an experience through inductive inquiry and richly descriptive findings (Merriam, 1998). I sought to capture a shared experience, with an emphasis on the human values therein, so that the essence of participants' experiences could be confidently interpreted. A multiple case study format yielded the holistic data needed to meet these goals.

Multiple case study research explores several similar instances of one phenomenon in order to gain understanding of the broader existence of that phenomenon (Stake, 2006). This study involved one phenomenon—how contextual factors influence instructional decision-making—as perceived by different people. By including multiple

cases, the findings were strengthened and potentially more externally valid by way of richly described contextual characteristics (Merriam, 1998). Though each case is a separate integrated system (Stake, 1995), they help form the story of the whole. My goal was to conduct in-depth exploration of the teaching contexts of participants in order to better understand each case individually, as well as compare and contrast data across cases.

**Participants.** Participants were secondary social studies teachers within a mid-sized public school system in Virginia. Given that the aim of this study was to better understand contextual influences, I explored varied secondary social studies contexts within one high school in the system. Participants were identified with the assistance of division personnel, social studies and educational technology coordinators, and the building level principal. Participants taught in the same high school environment and had average class sizes as identified by division mandates. Given the prevalence of high-stakes end of course testing in the state, participants all taught *tested courses*, those that require passing an end-of-course test for credit, as opposed to *non-tested* courses in which an end-of-course test is not required. Participants had varying levels of teaching experience and were all licensed to teach in their assigned content area. This depth of knowledge indicated participants' immersion in the information ecology of their teaching context while promoting diversified avenues of inquiry. These variations provided balance within the multiple case study design and enabled a thorough exploration of context similarities and differences.

A relatively small sample size of three participants promoted manageable uniqueness, balance, and variety (Stake, 2006). I selected the participants purposefully in



order to reflect a typical, or normal environment for the phenomenon, social studies teaching context (Patton, 2002). A purposeful effort to select participants that shared a common school environment and/or a common course preparation allowed for some shared characteristics that were useful in cross-case analysis. For the purposes of this study, a typical social studies teaching context is one in which a standardized curriculum framework, provided by the state, is utilized by teachers in a typical classroom environment with access to technology tools and resources that are common to most public schools in the region. Participants have had a variety of teaching experiences in terms of social studies subjects taught and the educational technologies at their disposal. Participants had consistent access to standard classroom technology tools and resources such as audio and visual multimedia, computers and/or personal computing devices, and access to the Internet. All participants gave informed consent (see Appendix A) and agreed to participate in the data generation procedures described below.

**Data generation procedures.** Data generation consisted of four overlapping strategies; face-to-face or asynchronous interviews, classroom observations, collections of classroom artifacts, and ongoing member checking to promote triangulation of data sources (Shenton, 2004). Throughout these processes I maintained organized records of data and communication with participants through reflexive journaling and careful record keeping.

The first step in the data generation process was an initial face-to-face interview with each participant. Interviews were semi-structured with open-ended questions and outlined according to predetermined topics and issues that explored the participants' teaching contexts. I facilitated the initial interview process with the use of an interview guide

based on the contextual layers, factors, and gatekeeping tendencies identified through the literature review (see Appendix B). The interview guide approach outlined topics and general questions while maintaining the flexibility to adjust sequencing and wording in the course of the interview (Patton, 2002). I incorporated follow-up questions tailored to participants' unique teaching assignments and experiences in order to explore the complexity of individual contexts. I performed member checking, by actively summarizing comments and asking clarifying questions, throughout the interview conversations to ensure I clearly understood and interpreted participants' viewpoints. I conducted additional interviews with other school staff, including the technology resource teacher and an assistant principal, to help me capture school or meso-level contextual perceptions from a vantage point other than that of the participating teachers. These interviews followed a modified interview guide (see Appendix C) to facilitate a broad view of the school environment.

Interview summaries, derived from digital audio recordings and transcriptions, were sent to participants via electronic mail in order to check for accuracy and ensure a transparent process with the participant. I scheduled follow-up interviews after the initial round of observations that took the format of asynchronous communication, videoconference, telephone conversation, or face-to-face discussion. When possible, follow up interviews coordinated with scheduled observations in an effort to inform interview conversations and ground them in observed practice. I requested at least two follow-up interviews with each participant. Follow-up interviews and/or communications were summarized and member checked in the same manner as initial interviews.

The second data generation strategy was observations of lessons in which the participant planned to utilize educational technology. I conducted three observations in each participant's classroom. I was present in the classroom during the observations but I was not an active participant in the lesson. During the observation, I recorded relevant field notes regarding technology use and apparent instructional decisions made by the participant. To facilitate a rich description and detailed observation of teachers' actions, I recorded field notes in the form of an observation guide (see Appendix D) and running record in which observed activities were recorded at regular time intervals throughout the lesson. I noted general observations about the lesson, descriptions of the setting, relevant quotations, and overall observer comments or impressions of the teaching context as related to the lesson (Merriam, 1998). Additionally, I noted specific instances of technology-related decisions and the apparent interpersonal, curricular, and institutional context factors. I performed member checking of all observation notes by forwarding an observation summary to the participant to check for accuracy and allow for edits or suggestions. A finalized copy of each observation report was saved for analysis. I conducted three observations for each participant in order to capture a broad scope technology use in different classes and points throughout the period of study.

Artifact collection was limited in scope and took place throughout the study in an effort to illuminate the planning and results of lessons that included technology integration. Examples included lesson plans, activity descriptions, and lesson materials such as presentation notes or reflections. At the initial meeting or interview with each participant, I specifically requested an assessment-related artifact, such as a project description or rubric that reflects some teacher considerations of technology use. Such

artifacts were useful in identifying aspects of technology use mediated by the teacher and identifying other contextual factors to explore in subsequent interviews. However, artifacts were offered voluntarily and were only minimally useful as clear examples of technology supporting specific instructional practices or assessment. Accordingly, I analyzed artifacts in terms of the instructional decision-making inherent in creating and using the artifacts in lessons. Questions or clarifications regarding the artifacts were addressed during follow-up interviews.

Member checking (Shenton, 2004) took place throughout the study including during and after the semi-structured interviews (see sample in Appendix E). Through member checking, I established clear and consistent accuracy in terms of participants' viewpoints. Additionally, I developed rapport to reflect honest efforts in understanding participants' perceptions of their contexts. Each instance of data generation was shared with participants in electronic form for their approval or opportunity to clarify or edit the information. This practice promoted authentic inquiry and established a foundation for fruitful analysis and interpretation.

**Data analysis procedures.** Data analysis took place throughout the study as data were generated and member checked. I stored data in a password protected cloud storage system and analyzed data in Dedoose, a secure, web-based analysis software, in order to facilitate organized data memos and data coding. Given the phenomenological approach to this study, I consistently bracketed, or set aside, my personal viewpoints or assumptions concerning the cases so as to better study the essence or structure of the phenomenon (Merriam, 1998). Accordingly, I employed data memo and coding

strategies, described below, which promoted reliable comparisons and categorizations of relevant data.

I analyzed data through recursive phases of review and coding. I reviewed interview summaries, observation field notes, and artifacts to develop researcher memos noting information that specifically related to the research questions. Additionally, I used memos to track and reflect upon case characteristics (people, practices, values, and technology) that contributed to the information ecology in which the case existed. These data memos promoted organization throughout the initial review process by capturing analytic thoughts as they occurred (Glesne, 2011). Memos reflected the various categories of contextual factors, contextual layers, and educational technology applications reported in the literature review. Data memos grounded the interpretation process and informed the formation of analysis codes.

Coding by discrete phrase or thought promoted detailed analysis of data by utilizing manageable “units of data” that expressed unique or relevant points (Merriam, 1998, p. 180). I utilized a priori codes as well as codes that emerged from the data. I structured a priori codes according to the aspects of context and gatekeeping delineated in the research questions (see code list in Appendix G). I applied descriptive codes that developed from the review and comparison of data in order to ground the various codes in the context of the cases. These codes informed my use of categories in which codes were organized.

Category construction was an important aspect of data analysis in that categories reflected “conceptual elements” evident throughout the data (Merriam, 1998, p. 182). Additionally, categories reflected the purpose of the research and promoted analysis that

was tied to the research questions. From these categories, I identified themes, or trends derived from the categories of information that illuminated the unique information ecology represented in each case. Themes reflected trends within each case as well as across cases to show commonalities and differences. As a result, the process of category construction and theme development informed my case and cross-case analysis with the goal of forming assertions that supported my answers to and discussions of the research questions.

I analyzed themes within and across the cases to determine the assertions that may or may not be made about teachers' decision-making regarding technology in secondary social studies classrooms. I interpreted these assertions through the Information Ecologies framework (Nardi & O'Day, 1999) to identify contextual influences in specific cases. Given the complexity of teaching contexts, such interpretations were firmly grounded in data as evidenced by the data analysis plan described above. The Information Ecologies framework provided the necessary structure to draw meaningful conclusions and interpret assertions within and across the multiple cases.

### **Ethical Considerations**

My interests in this area of study stem from my experiences as a social studies teacher and my desire to further the field of meaningful research related to social studies instruction. That that end, I conducted a thorough research study and fully embraced accepted ethical considerations and scholarly standards. The following sections detail my role as the researcher, my efforts towards trustworthiness and authenticity, and the known limitations of this study.

**Researcher as instrument statement.** All qualitative inquiry requires the researcher to participate in the collection and analysis of data (Patton, 2002). For this study, I actively generated data through face-to-face interviews, personal communication, and in-person observations of the participating teachers. Additionally, I gathered selected classroom artifacts for analysis. Though I have experience as a teacher in a secondary social studies setting, I endeavored to maintain trustworthy and authentic standards of inquiry, discussed below, to ensure that my understandings are well anchored in the data as opposed to my own experiences. However, I do not claim a completely objective perspective of the topic of study, nor do I believe such a goal is attainable. Therefore, I bracketed, or set aside, my notions and preconceptions of the phenomenon in order to more fully experience it as perceived by the participants (Patton, 2002; Tufford & Newman, 2010).

Beyond data generation and analysis, I engaged in interpretation of data in order to come to a meaningful understanding of the context under study. This process of interpretation is derived from my efforts at “sensemaking, a human activity that includes intuition, past experience, emotion, etc.” (Wolcott, 2001, p. 33). As a result, my experiences as an educator, though bracketed, likely informed some aspects of interpretation. I experienced the teaching and learning process in secondary social studies classrooms for ten years as a classroom teacher. During that time, I became increasingly aware that my teaching context influenced my instruction. Specifically, the curricular and instructional decisions that were made by my building level and central office administrators could potentially limit or enable certain instructional practices. Though these experiences helped form my strong preferences for autonomous teaching

environments, I am interested in exploring the experiences of other social studies teachers in contexts different than mine.

It is my belief that my overlapping experiences as an educator and researcher ultimately strengthened the quality of this study. Given these experiences, I conducted a study that is robust in theoretical underpinning and valuable in practical understanding. Therefore, my perspective as the instrument of research was grounded in efforts towards trustworthy and authentic scholarship.

**Trustworthiness.** I took specific steps to promote research that was conducted responsibly using reliable data generation and analysis strategies. The resulting contribution is a trustworthy source of scholarship. Trustworthiness in qualitative research is a preeminent characteristic similar to the rigor of validity and reliability in quantitative research (Lincoln & Guba, 1985). Specifically, trustworthiness involves establishing credibility, dependability, transferability, and confirmability (Lincoln & Guba, 1985). I designed this study to capture these qualities and enhance trustworthiness.

I strived to establish credibility through findings that are well grounded and supported in the data. Through prolonged engagement with participants via interviews, observations, and electronic communication, I generated rich data that enabled thorough analysis. Additionally, I triangulated multiple data sources to ensure well-developed and consistent data generation. I utilized the member-checking techniques detailed above to encourage participants to check and verify my understanding of their thoughts. In doing so, I developed “anchored understanding” of the cases and confidence in my interpretation as one grounded in data (Wolcott, 2001, p. 36).



I promoted dependability through careful record-keeping and organization that formed an audit trail that would allow independent researchers the ability to follow the path of my research and analysis (Lincoln & Guba, 1985). Strategies for this goal included detailed descriptions of data collection, category formation, and a record of how these decisions were reached throughout the inquiry (Merriam, 1998). I kept a reflexive journal of regular updates and status reports to organize and describe the inquiry process. These practices strengthened the consistency of my findings and enhanced dependability through rigorous and transparent record-keeping.

Finally, I further established trustworthiness by efforts toward transferability and confirmability. To promote transferability, I described the contexts of each case in sufficient detail so that readers can understand the similarities and differences to other contexts in which findings may be useful. Such “thick description” promotes a thorough understanding of the phenomenon (Lincoln & Guba, 1985). Similarly, findings are confirmable through a clear connection to the data. Efforts toward reflexivity and triangulation help ensure that the findings are anchored in participants’ perceptions. My goal was to conduct inquiry that was not unduly influenced by my being the instrument of research. However, the natural overlap of my experiences with the phenomena I studied is disclosed in the *researcher as instrument* section above. I recognized this potential for undue bias and consistently promoted confirmability through the aforementioned efforts for careful record-keeping and reflexive journaling. Additionally, I utilized the triangulation of multiple data sources, such as interviews, observations, and artifacts, to ensure a robust account of the phenomena (Patton, 2002).

**Authenticity.** Authenticity refers broadly to the meaningfulness of the inquiry and fairness of the interpretation stemming from qualitative research (Patton, 2002). More specifically, Guba (2004) describes authenticity in four forms: ontological, educative, catalytic, and tactical. Each of these forms is anchored in the precondition of fairness. Guba (2004) describes fairness as supporting participants' involvement with equal and consistent treatment of their views and making certain such views are clearly represented. In this study, I promoted fairness through clear communication with participants and consistent thick contextual description. I ensured member checks were conducted throughout the interview process and after interviews were summarized for participant review. Given this foundation of fairness, I endeavored to achieve authentic inquiry in each of the four criteria.

Ontological and educative authenticity promote similar outcomes based upon the value of the participant experience. Ontological authenticity refers to the extent to which participants' views develop or change over the course of the inquiry (Guba, 2004). I discussed participants' beliefs about the study topic throughout the inquiry process and sought to discuss, and clearly represent, how views or beliefs changed. Similarly, I promoted educative authenticity in that participants had the opportunity to gain understanding and appreciation of the views of others (Guba, 2004). I documented and discussed, in subsequent interviews, any changes in participants' perspectives that resulted from a greater awareness or empathy involving views outside their own.

Catalytic and tactical authenticity promote a sense of meaning through potential actions resulting from this study and findings. Catalytic authenticity is the extent to which purposeful action is taken as a result of the inquiry (Guba, 2004). To that end, I

communicated with all participants and their respective administrators, via email correspondence, to make the final report and results available for their use. It is my hope that participants gained new knowledge or views from which they can take specific actions in their classrooms and schools. Furthermore, I promoted tactical authenticity, the degree to which participants are empowered to act based upon results of the inquiry (Guba, 2004). Through discussing the nature of their participation and ensuring their satisfaction with the process, inherent in the member checking process, participants will be confident in the findings of the inquiry. These efforts toward authenticity ensure that this study is a meaningful contribution to the study of teaching contexts.

**Limitations and delimitations.** The nature of qualitative research rests on the assumption that there is meaning and understanding in the world around us. However, most studies such as this propose a micro-examination of the world in order to facilitate thorough and focused exploration of the study topic. The following limitations and delimitations characterize the specific assumptions and parameters of this study.

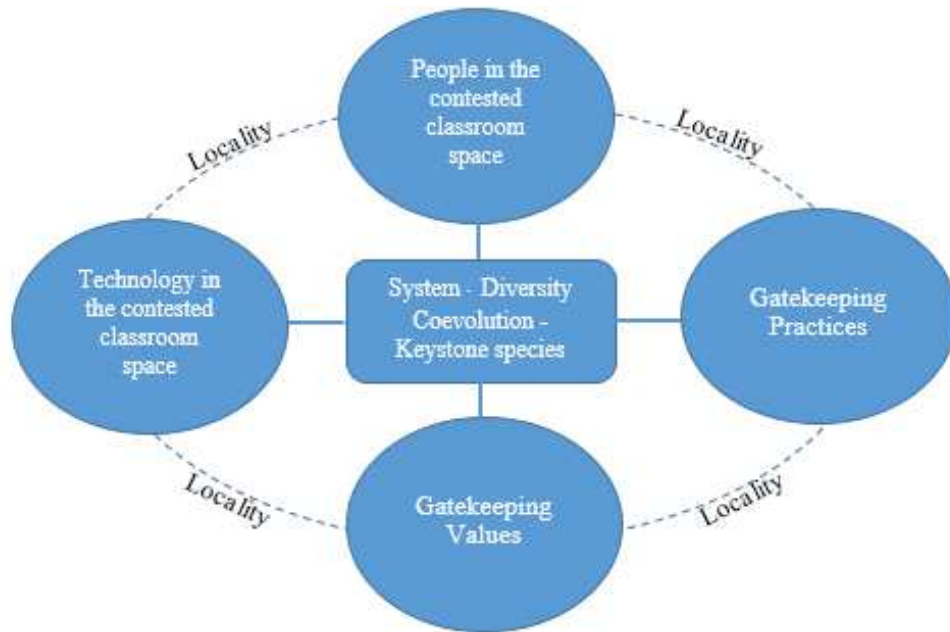
As with most qualitative inquiries, this study was limited in scope. I studied a relatively small group of cases within a particular environment during a particular time. As such, my inquiry was limited to what was observed, recorded, and discussed within the bounds of my temporary involvement with participants. Additionally, this study was limited by the complexity of the subject matter. I was not able to confine the constructs of *context* and *teacher perceptions* in a way that allowed me to completely perceive any case. Though a limitation, this aspect necessitated my interpretivist perspective in seeking to explore and illuminate, based on sound theory and anchored understanding, rather than explain or justify.

Delimitations include characteristics of this study that were in my control through the design of the inquiry. Specifically, this study was guided by the research questions targeting a particular curriculum area and type of instructional decision. My inquiry was shaped and delimited conceptually by the assumptive characteristics of Craig's (2009) contested classroom space and Thornton's (2005) curricular-instructional gatekeeper constructs. Another delimitation was the intentional sample size of three participants. As a multiple case study exploring contextual influences, this sample size enabled me to thoroughly investigate the micro and meso contextual layers of participants' environments so I could explicate the findings in terms of the research questions.

## **Chapter 4: Findings**

This study aimed to explore the potential connections between a teacher's context and their instructional decision-making. Specifically, I wanted to better understand how, if at all, interpersonal, organizational, and curricular contextual factors influenced teachers' decisions regarding educational technology use. To this end, I incorporated interview, observation, and artifact data from each participant to inform a thorough analysis of their classroom as a unique local habitat, or information ecology (Nardi & O'Day, 1999).

Data generation took place over a period of 12 weeks in the winter and spring of 2016. During this time, I endeavored to maintain consistent communication with participants in an effort to understand their schedules, curricular approaches, and technology use decisions. Each teacher served as a unique unit of analysis, or case, that provided a thorough characterization of the instructional decision-making taking place within his or her information ecology. Accordingly, framing the teacher as the unit of analysis informed my exploration of gatekeeping practices in a classroom space that is contested by competing variables. As described in the Chapter 3, the Information Ecologies framework (see Figure 4), integrated with the conceptual lenses of gatekeeping and contested space, structured my data generation and analysis.



*Figure 4.* The Information Ecologies framework through the conceptual lenses of contested classroom space (Craig, 2009) and curricular-instructional gatekeeping (Thornton, 2005)

This framework provided a consistent approach to characterize participants’ teaching contexts as integrated systems within the common environment of one high school. The following sections describe the study environment of American High School, followed by a thorough presentation of each case.

### **Study Environment**

American High School is a mid-sized school in Virginia consisting of approximately 1,400 students in grades 9-12. American High is one of three high schools in the school system and serves what can be considered a fairly homogenous population of students in terms of race, ethnicity, and socioeconomic status. Approximately 75% of students identify as White, whereas approximately 25% identify as part of a minority group or as multi-racial. Approximately 15% of students are eligible for free or reduced-priced lunch. With a graduation rate consistently above 90%, American High has a strong

record of preparing students for college. More than 80% of students participate in post-secondary education after graduation. American High consistently meets or exceeds state accreditation standards and is currently fully accredited by the Virginia Department of Education. Additionally, American High has met all applicable Federal Annual Measureable Objectives. In general, American High is considered by the local community to be a consistently successful high school and is equally successful in hiring and retaining highly-qualified personnel. As evidenced by the ongoing fully-accredited status, low teacher turnover, and high-achieving students, American High offers an effective teaching and learning environment.

Teachers at American High School operate on a hybrid 4x4 block schedule. Some courses are taught every day for one semester, while others meet every other day for the entire academic year. Participants in this study teach primarily semester courses, such as World History and Geography. One participant teaches a VA/US History class on an A/B schedule that meets every other day. Teachers are afforded planning time each day and are assigned to interdisciplinary faculty offices that serve as work and collaborative space. The interdisciplinary model extends to classroom assignments in that teachers are clustered by collaborative groups rather than discipline. Most teachers share classrooms and interact with teachers from other disciplines on a daily basis. Within this instructional environment, study participants navigate their daily curricular-instructional decisions. These decisions often incorporate educational technology resources that contribute to teachers' unique information ecologies.

American High School features standard audio-visual hardware and some computer resources in every classroom. Supplementary resources are available on a

limited basis through the school's media center. In my effort to understand the typical teaching context at American High, the instructional technology resource teacher at American High provided me with a summary of resources available to teachers (see Appendix F). Standard technology resources in every classroom include a ceiling mounted projector, speakers, a teacher input panel, teacher control panel, a document camera, a wireless keyboard, and a teacher microphone. Additionally, every teacher has a school-provided laptop with standard software such as Microsoft Office and an iPad with the screen sharing software Doceri. Supplementary hardware available in the school includes, among others, laptop carts, computer labs, digital cameras, and iPods. Paid access to subscription-based websites and applications, such as Discovery Education and Learning Gizmos, are available for teachers to access as needed.

Interest in educational technology at American High varies among departments and individual teachers. According to Sarah, the technology resource teacher, teachers take advantage of technology resources sporadically. She explains,

[Some] teachers try very hard to integrate educational technology in their courses, but they are easily frustrated by other factors, like the 4x4 block schedule, early dismissals, and lack of reliability with the network...many encourage students to use their own devices.

Sarah believes the lack of consistency in providing comprehensive resources and adequate support to all teachers adds to the significant variation in teachers' use of technology. For example, a recent division-level decision to remove school-based hardware technicians has decreased support as technicians now rotate in periodically. Without a specific mandate or consistent support system, teachers at American High



continue to take an individualistic approach to educational technology use. Every teacher leverages different tools and resources at different times for different reasons. A closer examination of this individualistic approach shaped the methodology of this study. The three participants provided unique cases for exploring their information ecologies.

### **Introduction of Participants**

Study participants teach a variety of social studies courses at American High School, though two participants have the common experience of teaching US/VA history this academic year. Each participant offers a unique perspective based on varied backgrounds and teaching experiences. Martha taught for 11 years at a different high school prior to arriving at American High School this year to teach US/VA history. She describes herself as an avid user of technology for teaching and learning; however, she is still acclimating to what she perceives as American High School's limited resources. Mary has 18 years of teaching experience, mostly at American High, and currently teaches World History and Geography courses. Mary uses technology regularly and often incorporates student use of computers or other devices into learning activities. Paul, a former military member and fairly new teacher, is in his first full year at American High, having joined the faculty halfway through last school year. He is teaching US/VA and World Geography courses this year. Paul sees tremendous future opportunities for enhancing his teaching environment with technology, but he is still developing his approach and often relies on paper-based activities.

The variety of teaching experiences and backgrounds served as a rich platform for investigating the uniqueness of each teaching context. However, the shared curricular experiences and teaching environment were equally important in conducting cross-case

analysis. The following sections present each case and teaching context as a unique information ecology. The Information Ecologies framework (Nardi & O'Day, 1999) gives consistent structure to each case and acts as a roadmap for understanding the interdependent and systematic nature of the participants' teaching contexts. Each case presentation will follow the aforementioned model to detail the people, practices, values, and technology in their ecology. Additionally, the resulting characterizations of system, diversity, coevolution, and keystone species are discussed to illustrate the dynamic nature of each information ecology. After the presentation of the three cases, I present findings from cross-case analyses in terms of overall themes that address my guiding research questions.

### **Case 1: Martha's Information Ecology**

Martha is an experienced teacher with a clear vision for successful teaching and learning in her classroom. Though this is her first year at American High School, this year marks her twelfth as a high school social studies teacher. The previous 11 years were spent in a neighboring school system. Currently, Martha teaches US/VA History on a hybrid schedule that includes one semester-long class and four year-long classes. Martha describes her philosophy of education succinctly as a dual focus on engaging instruction and preparing students to be 21st century citizens. She explains, "our children are going to be 21st century workers so they have to have that piece. They have to know how to use technology in the workforce because everything is geared to that." This guiding philosophy imbues her daily instructional decisions as she regularly leverages technology resources for real-world learning experiences that embrace practical applications of student knowledge.

A typical lesson in Martha's classroom includes a short portion of class dedicated to teacher-led direct instruction, and several student-centered activities in which students pace themselves as they work towards established learning goals. Martha uses technology throughout class, though she often has to adjust her schedule and plans to accommodate the available resources. In each of my observations, Martha engaged the students in some basic discussion or review and then transitioned to an ongoing project or assignment. I observed students choosing various methods to access and make progress on their projects. Several students accessed their email, mostly on their own phones or devices, to retrieve project details or web-based resources. Additionally, I noted students choosing various methods, provided by Martha, to express their knowledge. Some created virtual timelines while others chose digital presentations or traditional essays. Such variety in pacing and approach typifies Martha's instructional methods. She views technology as way to personalize instruction and efficiently manage student needs.

Martha's information ecology is shaped by the people, practices, values, and technology in her locality. The following sections address each of these information ecology aspects through the lens of gatekeeping within a contested classroom space. Additionally, the resulting ecological characteristics of system, diversity, coevolution, and keystone species conceptualize the contextual influences on Martha's instructional decision-making regarding technology use.

**People in the contested classroom space.** Martha is collegial and relational with the multiple stakeholders involved in her classroom. She values input from and dialogue with students, parents, colleagues, and administrators. However, she recognizes high expectations from parents as paramount when she designs her courses and interacts with

students and administrators. Though Martha does not view parental expectations as a negative factor, she gives significant weight to parental expectations as they consistently contest the instructional space in which Martha makes decisions.

Martha characterizes the significant presence of parental expectations at American High School as demanding, which seems unusual in comparison to her previous school. In her words,

We have a very affluent population of kids in this building and there are some teachers [who] struggle with teaching that. The parents are definitely very demanding. They expect A's, perfect grades, perfect GPA because the future is already planned for their child. So we are expected to fit into their plan, and they're sure to let us know that.

This contesting factor is prevalent in many aspects of Martha's classes. Martha consistently posts updated grades to the parent-accessible, online gradebook in effort to keep parents informed. She develops assignments that are rigorous yet achievable in hopes of creating a clear path to success, in terms of grades, that appeases parental expectations. Martha notes that this contesting factor does not typically lead to problems or tension because her philosophy of education is driven by experiential goals rather than grades:

My philosophy on education is probably a lot different than some of the teachers in this building. I don't feel that education should be impossible to obtain. I think my job is to make education interactive and as fun as possible so that they enjoy learning. I do that, and they really enjoy coming to my class. I very rarely give out Fs for anything because most of my kids want to do the work.

Martha's value for meeting parental expectations is a contesting factor in her classroom, yet it is one that integrates well with her approach to teaching and learning. The structure of Martha's classes is student-centric. Students have choices in learning activities and often work at their own pace with their choice of technology resources. This is a motivating factor for students, and most students do well in Martha's classes. Accordingly, most parental expectations are met in terms of the success they expect of their child.

Martha's student-centric pedagogical approach is largely inquiry-based and encompasses the needs of her students, the expectations of parents, and confines of the curriculum. Though parents are the primary force contesting the instructional space, Martha views her decision-making agency as very high as she works extremely independently and feels very little pressure from colleagues and administrators to accomplish her goals in a prescribed way. Such highly-independent practices define her role as the curricular-instructional gatekeeper (Thornton, 2005).

**Gatekeeping practices.** Martha values the autonomous nature of her gatekeeping while simultaneously expressing surprise at the laissez-faire approach of her colleagues and administrators. Her previous school system valued a much more integrated approach to planning and assessment. There, teachers were expected to participate in common planning sessions, follow a common pacing guide, and administer common assessments. Building-level and central office administrators required accountability measures to ensure these processes were followed. At American High School, Martha perceives the situation to be very different. She noted that teachers are very independent minded and have tremendous freedom to plan, teach, and assess however they choose.

There's a very definite fear of teacher pushback in the building, and the teachers know it. I mean, the veteran teachers that have been here will tell you, [administration] *is not going to force us to do [anything], because we will push back against it, and they will back off.* And that's the mentality that's inbred, from the teachers in this building... So, the culture is already there. The teachers make the decisions in this building.

Though this environment of teacher autonomy and instructional freedom is new to Martha, she is adapting her approach to take advantage of her context. This environment defines the boundaries of Martha's gatekeeping practices by allowing for risk-free instructional ideas or experiments and a personalized approach to the curriculum.

Observations of Martha's classes, along with artifact analysis of weekly lesson plans, revealed student-centric gatekeeping practices that often supported student-paced projects, collaborative working groups, and student choice. One such project involved students summarizing Constitutional Amendments in order to build a presentation or oral report on key features of the United States constitutional government. Students used their own devices and school laptops to research and build the presentations. This approach is common in Martha's class because she wants students to go beyond textbook information and synthesize what they have learned. From her perspective, this approach is the signature pedagogical practice in her classes:

I always go above and beyond the curriculum anyway. I try to pull in relevant things to their life, things that they will understand now. We do a lot of performance based project assessment learning, that kind of thing, and I make

sure that when my kids leave the classroom they've learned what they need to learn and maybe a little more if we can squeeze it in.

Martha's gatekeeping practices center on what is possible, through inquiry and exploration of history, rather than what is required knowledge for passing the state-mandated Standards of Learning (SOL) test. Her practices reflect a value that goes beyond the state curriculum and focuses on real-world application of knowledge. The following section details how this gatekeeping value contributes to Martha's information ecology.

**Gatekeeping values.** Martha's gatekeeping values clearly reflect her philosophy of education that favors preparation for 21st century work and life. Martha recognizes the importance of preparing students for the Virginia SOL test, however, preparation for the test is not the key value behind her gatekeeping. She does not see these separate goals as mutually exclusive. Martha states, "for me, it's not one against the other. They have to work in tandem." In an observation of Martha's class, students were given significant time to complete a midterm review packet that emphasized SOL-fact/recall knowledge. Martha recognized the need for this type of preparation, but planned to extend student exploration of the topics beyond the essential understandings delineated in the state curriculum by returning to a media project after the review. Valuing the development of applicable knowledge anchors Martha's orientation towards teaching and learning.

Martha's personal orientation towards teaching and learning is rooted in the idea of preparing students for success beyond the classroom. In turn, her gatekeeping reflects this *educational orientation*, comprised of pedagogical and personal values, through inquiry-based lessons and avid technology use. However, her values are tempered by the

prescribed curriculum framework and assessment measures mandated by the state.

According to Martha, “[administrators] don’t care how you arrived at the finish line, as long as the finish line number is about 90%, they don’t care.” The 90% references the pass rate on the SOL test, which Martha identifies as the ultimate building-level goal and measure of success. Martha recognizes this expectation, abides by it, and uses it to her advantage. In her view,

Pass rate is really not the end goal. The end goal is learning taking place. Fun learning taking place. And the students leaving you better than when they came. Student growth. And that would include a high pass rate because if they’ve learned and they’ve grown then the pass rate will come.

As long she meets the end goal of SOL success, she can practice the instructional freedom afforded to her in such a position to better meet her goals of well-informed 21st century learners.

Martha feels that her gatekeeping values are not reflected in the attitudes or actions of her colleagues. This perceived inconsistency from classroom to classroom offers a poignant juxtaposition of differing teacher pedagogical aims. From Martha’s perspective, learning goals that reach beyond student performance on the SOL are not common throughout the building, which serves to narrow some teachers’ gatekeeping to focus only on required content standards and antiquated pedagogy. In reference to this approach taken by some teachers, Martha declares:

Well it works. The old way works. They’re getting the scores for the majority of the children and that’s really all that matters. If it’s not broke, don’t fix it. That’s the mentality. Without realizing that it’s not that you want to fix something that’s



broken, you're just trying to improve on something that's already great. But that's the mentality.

In this first year at American High, Martha feels somewhat isolated by gatekeeping values that differ from her own. However, this feeling of isolation sharpens her resolve to teach in a distinctive way in comparison to others in her building. It is clear that Martha makes many pedagogical decisions, especially those that intersect with educational technology, based on her value for preparing students for life beyond high school. In Martha's information ecology, this orientation influences the role of technology more than any other gatekeeping value.

**Technology in the contested classroom space.** The technology tools and resources available at American High School deter Martha's ideal pedagogy and preferred instructional resources. The resulting classroom space is contested in that Martha perceives severe limitations on how she designs her instruction. This challenge is magnified by the paradigm shift Martha experienced when transitioning from her previous schools system, one she describes as "technology-forward," compared with her current system. Martha attributes this significant difference to funding models and system priorities. She explains,

My last division was Title I and so the money came from grants and from the state to buy the technology and advance it as much as possible in instruction. This [school] is not Title I and so if they desire to have technology, it won't come from the state. It will have to come from the budget for the system and [that priority] simply isn't there.

Martha perceives American High to be lacking in technology resources as well as in the motivation to leverage such resources regularly. She describes her adjustment to this environment as taking a step backwards in her preferred pedagogy.

I came with a flash drive and everything ready for technology. I had a class webpage in [my previous system]. [I had] the virtual online learning app for snow days and things of that nature. This division doesn't have any of that. So I spent a lot of the pre-teacher days just trying to wrap my head around the fact that, everything that I had digital, I now had to make hard-copy.

Martha frequently referenced the significant amount of paper copies made at American High. She sees this phenomenon as the epitome of the school's constraining technology environment. In short, Martha believes American High is significantly under-resourced, plagued with unreliable networking, and lacking a clear vision for improving educational technology.

The limited technology resources at American High are a source of regular frustration for Martha. She views this challenge as a chain reaction of frustrating circumstances. For example, a recent lesson called for students to choose an online storyboard or traditional essay as the assessment for the topic at hand. This would require, at minimum, laptops for the class and a reliable network connection. However, Martha experienced persistent difficulties with both. American High has just two dedicated computer labs, for large classes, and seven laptop carts available for teachers to reserve. Laptop carts have, on average, 20 computers, but Martha's classes usually average 25 students. Moreover, Martha claimed the school wireless network is often unreliable. When laptops are available, Martha reported they often require between 15

and 30 minutes to power on and connect to the network. Encountering challenges with such basic aspects of technology use is a frustrating experience for Martha. Given her preference for using technology as a primary aspect of her instruction, Martha has had to work hard to find workarounds for students. These workarounds include individual email accounts for all students to access materials outside of class, a liberal bring-your-own-device (BYOD) policy, and a dedication to providing after-hours resources to students who need them.

The information ecology of Martha's classroom is shaped by her efforts to use technology as a key resource. Simultaneously, it is characterized by the limited technology resources available. These tensions, along with Martha's gatekeeping values and awareness of parental expectations give rise to the unique ecological characteristics of system, diversity, coevolution, and keystone species.

**Analysis: A challenging information ecology.** Just as biological ecologies persist at varying levels of health or success, Martha's information ecology is functioning under challenging circumstances. The following sections detail the unique characteristics of Martha's information ecology.

**System.** The information ecology in Martha's classroom is the result of multiple interacting elements. Clear expectations for students are matched with clear guidance and support from the teacher. Parental and institutional goals for student achievement are balanced by Martha's experience and record of success in preparing students for state SOL tests. Unfortunately, the system falls out of sync when balancing instructional methods and instructional resources. The larger context of Martha's classroom cannot support her preferred pedagogy in terms of technological resources and reliability.

Though Martha often finds sufficient substitutes for such resources, the resulting system lacks the efficiency and effectiveness to which Martha's pedagogy aspires. The system created by Martha's information ecology suffers from a significant gap.

This gap is created by the systemic interdependency of Martha's instructional goals and available resources. The classroom result is an information ecology limited by infrastructure and organizational resources such as reliable wireless networks and adequate computers. From Martha's perspective, this is the most constraining aspect of her teaching context. However, this limitation does not preclude other strengths of the information ecology, as observed in terms of diversity.

***Diversity.*** A healthy information ecology embraces diversity and eschews monoculture—a reliance on one approach or tool to handle change (Nardi & O'Day, 1999). Martha's information ecology embraces diversity in terms of tools, people, and interests. Her autonomy in planning, teaching, and assessment support her diversity in approach.

Given the limited technology resources in her system, Martha works hard to create a classroom environment that embraces multiple paths towards a goal. When assigning a project that leverages digital tools, she provides multiple options such as presentation builders, storyboard resources, and text-based options. Additionally, she encourages BYOD and empowers students to access information on their own terms. Martha is keenly aware of the personality and tone unique to each class and she augments instruction to best meet the needs of students. She states,

I try to differentiate my instruction so I hit everyone. I will say this is the first school I've been in which very few students struggle. That population is so small

in fact that they most often get overlooked by other teachers in the building. I have five students who fit that description and I work closely with them to make sure they get whatever remediation they need.

Martha offers various assignment choices and tailors expectations to best serve individual classes. For example, one class might be required to work individually, but at a slower pace than a class with faster moving collaborative groups. Students take diverse routes for accomplishing learning goals and they feel comfortable personalizing their approach. Due to Martha's support, her students capitalize on the diverse tools, approaches, and ideas present in the information ecology. This, in turn, leads to consistent path for coevolution.

***Coevolution.*** As an information ecology incorporates change, often due to new constraints or possibilities, it contributes to the coevolution of social and technical aspects of the system (Nardi & O'Day, 1999). In Martha's information ecology, coevolution is clearly present in the dynamic nature of Martha's lessons as well as the multifaceted experiences of the students.

Martha is adept at finding ways to make technology work for her, and for the students, despite infrastructure limitations. Her expertise in leveraging cloud storage, free email accounts, web-based tools, and BYOD is continually developing. Though the platforms may be inconsistent from class to class or year to year, Martha continually crafts her approach to meet the needs of her students. This is a challenge she accepts:

The school has very limited laptops for the students. The ones the teachers have rarely ever work, the network is always down, the classroom technology is spotty, [but] if you try, you can find ways to get around it.

In Martha's information ecology, to "get around it" is the impetus for much of the coevolution that takes place. As students attempt projects, complete homework, or participate in class, they offer feedback necessary for Martha to maintain her dynamic approach to making instructional adjustments and accomplishing her goals. The vital role of the students in this process highlights their presence as the keystone species.

***Keystone species.*** Every healthy information ecology benefits from a species that is crucial to its survival. According to Nardi and O'Day (1999), "when we add new technologies to our own information ecologies, we sometimes try to work in the absence of essential keystone species. Often such species are...necessary to support the effective use of technology" (p. 53). This characteristic rings true in Martha's information ecology, where students' use of technology is key to the survival and thriving of the ecology. Though any classroom would cease to be effective without the presence of students, not all classrooms—or information ecologies—elevate students to the role of keystone species (Ertmer et al., 2012; Walker, 2010). Martha's students supplement technology deficiencies by using their own devices and cellular data plans. They adapt to changing technology platforms with ease and are generally productive despite the unreliable technology hardware at their disposal. If not for the flexibility of these students, Martha's information ecology would not function. As she explains,

It's the school's policy that they can bring whatever technological device they have to use in the classroom, per the teachers approval of use. I allow them to use [their own devices] for virtually everything if they choose. Some have their entire notebooks on the laptop and some are all paper. It's whatever works for the individual student, really, since there is no [single] program for use.

Martha's students play a key role in the daily learning activities that shape their environment. Their preferences and choices guide their experiences while informing Martha's instructional decisions. Students' role as the keystone species in Martha's information ecology is apparent when considering the challenge of an environment that does not fully support Martha's preferences regarding technology resources.

These four characteristics of Martha's information ecology—system, diversity, coevolution, and keystone species—and the preceding description of key elements of the ecology, helps increase practical understanding of the complexity of Martha's teaching context. Based on the foundation of this understanding, the following sections detail the themes that address the research questions regarding contextual influences and contesting factors.

**Contesting meso-layer factors eclipse technology-related pedagogical aims.**

Meso-layer factors include school or system-wide infrastructure, institutional preferences, and other organizational factors that shape the school environment. In Martha's case, meso-layer factors such as wireless network limitations, lack of consistent access to computers, and insufficient cloud-based resources impede fulfillment of her pedagogical aims. Martha must reallocate time to account for technological limitations. She works hard to find a path around the constraining technological resources and is often successful. However, it is the need for these work-arounds that point to the contesting meso-layer factors. Regardless of Martha's professional efforts, she is powerless to control the wireless network, the age of the laptop computers, or any other school-wide resource that results from district policy. As a result, Martha spends time and effort making her available resources, and those of her students, work for her. It is within this

reallocation of time and effort that Martha's classroom space, and the enactment of the curriculum within, is contested, thereby constraining her pedagogical aims. Martha describes a recent example of pedagogical constraint as a common occurrence:

Network failure for sure. That's a given. That happens on a regular basis. Where the kids are unable to access. Half can access. The other half's login ID's fail. That's a pretty common occurrence. Or they can get it, but it's broken. They can get the notes but they can't fully see them. They're pixilated or something, and that all goes back to the network not working the way it's supposed to. So, the backup of course is always to use [my computer]. I'll plug it in and we go back to the old fashioned way. But that's not efficient. It's much more efficient to let them work at their own pace.

Martha views "the old fashioned way" of didactic, teacher-centered instruction as the backup for her preferred pedagogy of inquiry and student collaboration supported by digital resources and communication. Often, she is able to change her plans or rearrange the class sequence to account for such contextual limitations. This ability to gatekeep, or having the agency to control the micro-context of the classroom, is a significant aspect of Martha's case.

**Significant agency is afforded to teachers to control interpersonal and curricular factors.** Martha describes the influence of teacher collegiality, administrative oversight, and central office curriculum pacing as non-existent. These factors are not perceived as negative, but rather a traditional or institutionalized approach to teachers as highly independent professionals. Whereas there is no district curriculum enforced, teachers are expected to align their lesson plans with the state curriculum framework. No



accountability system or administrative oversight is employed to ensure teachers stay on track with state expectations.

Though teachers are collegial in terms of professional courtesy, Martha experiences little co-planning or resource sharing. From Martha's perspective, this hands-off approach is the result of the single success measure in place to gauge teacher success, the teacher-specific pass rate on the state-mandated SOL test. Martha explains, "In this building, well, this division, but especially in this building, it's about data. It's about numbers." The numbers in Martha's department are very good, which solidifies the cyclical nature of the gatekeeping described by Martha. Teachers have significant freedom and agency to run their own classrooms assuming SOL test pass rates are acceptable. However, because of the acceptable pass rates, no administrative oversight or teacher-collaboration is present to act as the impetus for more engaging instruction. Given these circumstances, Martha's teaching context may never change to more closely match her personal preferences and professional approach to instruction, thereby limiting a unified approach to improving teaching and learning experiences at American High School.

## **Conclusion**

Martha's teaching context can be understood as a challenged information ecology. The interdependent system required for successful technology use is missing the infrastructure and prioritization necessary for it to be fully functioning. Though this is challenging for a self-described "all digital" teacher like Martha, the significant agency afforded to her to gatekeep as she believes to be best is a balance to the technological constraints at American High School. In the case of one of Martha's colleagues, Mary,

the teaching context is less constraining due to a remarkably different value associated with technology.

### **Case 2: Mary's Information Ecology**

Mary's 18 years of teaching experience inform her consistent and efficient approach to instruction. For the past 12 years Mary has taught World History and Geography at American High School. This significant experience shapes her information ecology through well-established relationships with colleagues and students, a consistent routine of instruction, and a balanced approach to technology integration.

A typical lesson in Mary's courses includes collaborative and/or individual classwork, a teacher-led mini-lecture with a digital slide presentation, and time allocated to ongoing projects or multi-day assignments. I observed several classes that used in-class computing devices such as iPods or laptop computers. In other classes, Mary met her students in the computer labs to facilitate a webquest assignment or ongoing research. Mary characterizes her pedagogical approach as regularly using technology when there is a clear value added to the learning experience. I did not observe students utilizing their own devices, but Mary indicated that this is allowed on some occasions. Overall, Mary's lessons follow a fairly regular routine of teacher-led and student-led learning activities that focus on efficiently mastering the state curriculum framework as well as exploring related ideas beyond the framework. An essential aspect of her efforts is the balance between autonomy and collaboration fostered among Mary and her colleagues.

**People in the contested classroom space.** Mary is highly independent and self-sufficient in her approach to teaching. She does not perceive people as a contesting variable in her classroom; rather, she recognizes the value of open collaboration with

colleagues and a strong rapport with her students. Mary readily shares lesson ideas and resources with other teachers and works to maintain open communication with teachers in other disciplines as well. In her view, this collaboration is ongoing:

We're always willing to help each other out in numerous ways between collaborating on lessons, helping one another if someone's taking a class and they need a volunteer, we're more than willing to help one another out. Covering each other if something happens, our teachers will step in and sub for you if necessary.

Collaboration extends beyond disciplines; therefore, Mary frequently intersects with teachers from other departments in their common office area. Though her instructional routine is anchored in past successes, she willingly adapts lessons based on new resources or ideas gleaned from colleagues:

I happen to like working in the same room with English teachers because they have different perspectives on things than a social studies teacher does. And we can collaborate, because we do teach things that overlap here and there. And we get ideas from each other that we might not have if it had been just social studies.

This perspective recognizes the wide array of resources stemming from professional relationships and collegiality. In Mary's experience this is an important resource for developing successful instruction.

Mary leverages shared resources for use in her classroom space and recognizes the importance of teachers making resources their own. In her view, the autonomy that allows each teacher to customize resources for their own classes is the key component of collaboration. She explains,

We try to collaborate. If a new teacher comes in and they're going to be teaching a topic that I teach, I'll just give them a thumb drive of everything I already have and then we'll sit down and work on it together and talk about ways that you can take this and use it if you want. If not, change anything you want. Make it your own.

Mary establishes a balance of independence and collaboration in her classroom space. Rather than contesting the classroom space, her collaborative approach broadens her perspective. However, this flexibility to collaborate and adapt instructional ideas is tempered by the collective personality of her classes and the individual student needs within.

Mary explains her rapport with students as very strong and almost family-like. During each of my observations, I witnessed this lasting bond as former students would stop by to say "hi," give Mary a hug, or report on how they are doing after leaving Mary's class. Mary always considers the unique attributes of individual classes that result from varied student personalities. Her careful attention to this blend of students in the classroom space results in positive rapport with students who then tend to perform well in the course. As Mary describes, this is key to her instructional approach:

The kids love me. I've had them call me mom accidentally. I guess it's my personality that comes out. I'm a little bubbly and exuberant. And the kids like that. I get excited about the topic I'm teaching, which gets them excited about it. It makes them want to learn more about it. They'll come in the next day, *Oh I just learned this. I found out this on the History channel.* And they'll come in and tell

me stories about what they did at home based on what we were learning in class.

So it gets them a little more excited about the topics in general.

Mary's relational rapport with students primes classroom activities and helps students feel comfortable as they interact with her. This strong value for positive student rapport, along with the aforementioned preference for collaboration, characterizes the significance of people in Mary's information ecology. In contrast to Martha's case, absent from Mary's perspective is the contesting factor of parental expectations. This is primarily due to the gatekeeping practices that focus on SOL mastery and result in very high achievement for Mary's students.

**Gatekeeping practices.** Mary's gatekeeping practices emphasize variety in instructional approaches and consistency in pacing. Her lesson plans and in-class activities consistently build from essential knowledge, or core facts that must be covered according to the state curriculum framework, and incorporate varied strategies for learning. In doing so, Mary hopes to engage a variety of learners while maintaining a focus on key concepts. For example, I observed Mary delivering a mini-lecture to her World History class that detailed basic facts on the Phoenicians. Students recorded their own notes as Mary highlighted significant concepts. Afterwards, students completed a self-paced, individualized activity viewing a video tutorial about the Phoenicians and guided, paper-based questions. Though there was some content overlap in the two sections of the lesson, Mary used multiple mediums to provide variety to her students in content delivery. Reflecting on her preference for balancing consistent knowledge development and instructional variety, Mary explains:

I do different lessons every day. You don't come in and expect the exact same thing every day. [For example], today we're doing notes, tomorrow is a video, the next day we're going to the computer lab. The next day we might be doing a stations activity using something that we created in the lab to do something else. Every day in my class is different.

This ongoing practice of instructional variety is central to Mary's gatekeeping, but it only extends to the teaching and learning activities. The content is static and focused on the prescribed state curriculum framework. This focus is intentional and heavily influences Mary's paramount gatekeeping value of student success.

**Gatekeeping values.** Values in an information ecology act as guide posts and set the tone for personal interaction and activity. According to Nardi and O'Day (1999), "people are not neutral...we bring our values to bear in designing and using technology" (p. 60). Through the lens of gatekeeping, values both guide decision-making and characterize the evaluation of teaching and learning success. In Mary's case, she establishes the value of student success in classroom activities based upon the prescribed state curriculum framework, which summarizes key facts and concepts that should be included in the course, and achievement on the state-mandated, end-of-course SOL test. The breadth of the curriculum framework necessitates thoughtful pacing in order to address each topic within the timeframe of the course. Mary believes all teachers should recognize the importance of the common framework and pacing in social studies. She explained,

We use the [state framework] as our guide. And as long as we are teaching everything that's on there, I'm comfortable that I'm teaching everything that's

necessary and required. No, I'm not teaching to the test. But I'm teaching what the outline of the [framework] is. I feel that if all the other teachers in the state are following the [state framework], if one of the students leaves my class and goes to another one, they should be able to pick right up.

Mary draws an important delineation between valuing the curriculum framework for the sake of the end-of-course SOL test and valuing the curriculum framework for consistent student success. She sees the curriculum framework as a guidepost for teaching, and as a common foundation on which to build successful learning experiences. From Mary's perspective, the consistent focus on the curriculum framework leads to high achievement on the SOL test. High achievement is indicated by a percentage of her students passing the test, usually in the high nineties, which reinforces her value for abiding by the curriculum framework. In other words, adherence to the curriculum framework is the starting point and the focus of instructional efforts. Student achievement on the SOL test is a byproduct of that adherence. This duality undergirds the gatekeeping values inherent in Mary's instructional decision-making.

The value for a prescribed curriculum framework surfaced frequently in interviews with Mary. At several points, she noted that she does not worry about the SOL test because her students always perform well from year to year. Though it is important that her students achieve high pass rates, her means to that end is anchored in her consistent approach to the curriculum. Using instructional variety to pique and maintain interest, Mary finds the prescribed curriculum framework to be freeing for her gatekeeping efforts. However, she measures her efforts in terms of high student pass rates from year to year. Here again a duality of values emerges, in that Mary perceives

tremendous autonomy in designing her courses, but she attributes that autonomy to student success on the SOL test. Reflecting upon this perspective Mary states, “there’s a ton of information in there that we have to cover. It’s how we cover it that makes it interesting.” Building on this value, Mary approaches technology integration as an opportunity to enhance the learning experience.

**Technology in the contested classroom space.** Mary chooses to utilize technology when there is clear value added to the learning experience. Though she does not rely on technology every day, as described in Case One (Martha), she recognizes the importance of having access to various technology tools. Mary views the technology resources at American High School as plentiful and up to date. She describes the district’s overall approach to technology as favorable in that there is a consistent effort to update resources and integrate them into classroom instruction. Similar to her approach to balancing varied instructional methods and efficient pedagogy, Mary strives for balance when considering technology availability and practical classroom use.

I think we’re pretty advanced in technology availability. Every time something new comes out, they bring it on. So they’re pretty up to date and wanting us to use it more and more. And you have to think about the aspect of: Are you using technology just for technology’s sake? Or is technology actually useful for what you’re teaching?

Mary views educational technology as a lever only to be utilized when it can truly enhance teaching and learning efforts. Though Mary regularly uses technology in her planning and teaching, she consistently considers the utility of technology in terms of students learning the curriculum.



Mary's approach to technology often results in using technology resources for organization and scaffolding of ideas, which allows students to encounter content by efficiently building on what they already know. Such uses enable students to work independently and at their own pace, as in the mini-lecture with video guide example described above. In a separate lesson, students followed a webquest guide to discover resources about Roman culture. All students completed the same assignment, but they did so on individual computers so they could encounter varied activities on the topic. This approach reinforced important concepts from the curriculum framework while allowing students to pursue items of particular interest to them. In this example, Mary aligned the parameters of the assignment with the resources available at American High. She leveraged the shared network drive to store the webquest file where students could easily access it, and reserved a smaller computer lab to accommodate her class of 15 students. Additionally, she made on-the-fly changes to the assignment to account for inactive hyperlinks or blocked websites. Throughout my observation of this lesson, Mary encouraged students to explore the topic in an organized manner that linked students' prior knowledge to new content. This lesson was successful in matching available technology resources with Mary's pedagogical aim. Though Mary views the technology resources as adequate, she sees room for improvement in social studies-specific applications.

Mary describes her school system as forward thinking in terms of technology resources, yet limited in foresight when considering discipline-specific applications. The superintendent, central office personnel, the information technology department, and building level administration are supportive of infusing technology into daily instruction.

However, Mary perceives these efforts as being applied uniformly to all disciplines, which contradicts her goal of using technology purposefully. She describes lesson planning with technology as technocentric as opposed to pedagogy-based. She explains, “When we get new technology, such as when we got the iPods, we created lessons to use them.” Mary believes a more efficient and valuable approach would be to seek input on discipline-specific technology applications. In her words,

Having the teachers have a little bit of input on it would be nice. Into what technology they could use instead of just blanket buying, *Oh this is a really neat thing, let's give it to everybody.* Don't waste the money on a resource that no one's going to use.

Despite the perceived forward thinking of district leadership, Mary experiences some limitations due to technology allocations that do not always apply to her discipline. She cites the example of electronic whiteboard tablets that interact with the computer display. She only sees math teachers utilizing that technology because it is less applicable to other disciplines. Accordingly, the presence of non-applicable technology acts as a constraint and contests the classroom space in which Mary makes technology-related instructional decisions by limiting technology choice.

Mary views the constraint of non-applicable technology as minor and mediates the challenge by utilizing technology only when it is a reliable and clear value for student learning. Mary's overall sense of technology resources at American High School is remarkably positive, especially when compared to Martha's views in Case One. Mary and Martha work in the same department at the same school. They have access to the same technology resources and teach students with similar backgrounds and abilities. The

significant differences in Mary and Martha's perceptions stem from their differing views on student learning. In Case One, Martha focuses on applicability of the learning experience. In Case Two, Mary values a curriculum-centric approach. This curriculum-centric view of teaching and learning informs Mary's decision-making and provides a consistent standard for managing an information ecology characterized by efficiency.

**Analysis: An efficient information ecology.** Mary's information ecology is practical and consistently efficient in terms of curriculum coverage and pacing. Her 18 years of experience and depth of content knowledge are evident in her planning and teaching. Throughout our conversations, Mary confidently identified and explained specific curriculum strands—without having to reference the curriculum guide—and how best to teach them. She knows the curriculum framework in detail, including where she can explore more deeply and where she must adhere closely to the prescribed strands. In Mary's view, this efficiency is necessary for success,

because in history, we have a tremendous SOL [breadth of content]. In ancient history we have from prehistory, 10,000 BC et cetera, all the way up to the 1500s. That's a lot of time to cover. So we have a lot of information to put in there. The geography SOL, again, a lot of information to cover. We cover economics. We cover government, human population, growth, migrations patterns, map skills, physical geography. Then all the regions of the world. So all of that has to be covered.

In Mary's classes, *coverage* refers to learning the necessary aspects of the curriculum framework in order to pass the end of course SOL test. The pathway to that learning is one of efficient use of time, instructional variety, and strong student rapport. The

following sections detail the system, diversity, coevolution, and keystone species that result from Mary's efficient information ecology.

**System.** An information ecology is characterized by “strong interrelationships and dependencies among its different parts” (Nardi & O’Day, 1999). This systematic nature of an information ecology is apparent in Mary’s classroom. Lessons run smoothly and students have a clear understanding of Mary’s expectations. Resources such as computers or iPods are integrated seamlessly to support students’ learning activities. If technology resources fail, Mary has a “plan B” in place so the lesson can continue. Though Mary expects students to be organized, extra copies of assignments or notes are readily accessible when needed. All of these aspects of Mary’s classroom contribute to a system of interdependent parts that work well and result in a reliable system of teaching and learning with no room for deficiencies. From this foundation, Mary uses varied instructional approaches to cater to a diverse group of students.

**Diversity.** The diversity of Mary’s information ecology is evident in Mary’s pedagogical strategies as well as students’ learning approaches. She views her students as individuals, with unique perspectives and preferences. Mary favors variety in daily activities as one pathway to accommodate differences among her students. She experiences a high degree of autonomy in her gatekeeping, which gives her the freedom to vary her instructional approach from day to day.

[Administrators] give you free rein as to how you can teach the information. I like to incorporate a variety of learning styles. I’ll give notes one day. Tomorrow we’re going to go to the computer lab. We’re going to do some Internet research. And then you may create a PowerPoint using the data for yourself. The next day

we might watch a video on an iPod or on the overhead, where they're compiling the information together again. I try and make it so that every day is something a little different. I like variety.

Mary perceives this diversity in approach as a strength because of the diversity of students, their attention levels, and their interests. She states simply, "I know kids get bored easily." Accordingly, she plans lessons to try to hold students' interests. Mary actively works against the monoculture Nardi and O'Day (1999) warn of when diversity is not present in an information ecology. This plan is successful, in part, due to the clear expectations Mary sets for students and the strong rapport she establishes with them.

***Coevolution.*** Mary's information ecology is characterized by an ongoing, coevolving relational rapport between her and the students. Students feel at ease with Mary. In each of my classroom visits, I was struck by the level of comfort exhibited by students. They are comfortable asking questions, making comments, or stopping by to visit between classes. Mary capitalizes on this rapport by building relationships that help her understand the students and their needs. For example, I observed her interactions with a student who needed some extra time and resources to complete an assignment. The student seemed very comfortable explaining her situation to Mary and knew Mary would support her efforts to work through lunch to finish the assignment. This interaction stemmed from a mutual understanding and comfortable relationship between the two.

Nardi and O'Day (1999) presented coevolution as an essential aspect of a healthy information ecology because it characterizes the change that needs to take place for members of the information ecology to adapt to new situations or challenges. When members of an information ecology coevolve, they are responsive to the needs of others.

In Mary's classroom, the student/teacher relationship offers that flexibility to coevolve.

As Mary explains, "Even some of the more difficult students for other teachers sometimes will do better in my classroom because I'm a very laid back person. That's just me." In being a "laid back person," Mary is approachable, relational, conversational, and most importantly, a partner in the information ecology that can respond to the changes around her to support an effective learning environment.

***Keystone species.*** The ecology members who must be present for the information ecology to thrive act as a keystone that holds the interdependent parts together. In Mary's case, she and her teacher colleagues are the keystone species that make her information ecology efficient. Mary capitalizes on collegiality to hone her professional practice and adapt her instruction with new ideas that can effectively transcend disciplinary boundaries. Mary's gatekeeping is predicated on her strengths as an efficient planner and curator of technology resources. In Mary's view, she takes a consistent path to success that rests on careful planning and efficient pacing. When asked about her priorities for instructional planning, she explains:

Just making sure we get whatever topic we have set up for that day, just making sure that we get the activity done. Because we do have a time frame to keep to, to make sure that we have everything covered by the time the SOL [test] is scheduled. And if I don't get through to the Middle Ages and into the Renaissance before the SOL [tests] come, I'm not going to have time to review.

Mary sets a clear expectation of curricular success when managing the information ecology of her classroom. Success is reflected by full exposure to the content, as determined by the curriculum framework, and continued high student achievement on the

SOL test. In both respects, Mary's presence, leadership, and professional collaboration shape the role of the teacher as the keystone species in her information ecology.

These information ecology characteristics provide insight into Mary's instructional decision-making. From this deeper understanding, the following themes emerged as answers to the research questions that guided this inquiry of contextual influences and decision-making.

**Curriculum factors, such as content standards and pacing, are the primary drivers for student success.** Mary recognizes the many interdependent parts of her information ecology, but she chooses to focus much of her effort on consistent use of the curriculum framework and a well-paced instructional experience. These curriculum factors are key aspects of Mary's teaching context that consistently influence her instructional decision-making. Mary's instructional decisions shape the students' experiences by establishing the curriculum framework content as a central focus in daily lessons. As a result, other contextual factors, such as interpersonal relationships and organizational factors, are secondary influences that Mary leverages to support her content delivery and coverage of the curriculum. Mary views the use of educational technology similarly and utilizes technology only when doing so presents a clear learning opportunity for students.

**Technology is best utilized when incorporated as part of a diversified approach to curriculum-focused instructional strategies.** Mary characterizes technology resource allocation efforts at American High School, and the district as a whole, as encouraging opportunity. However, the actual use of technology resources varies when examined at the classroom level.

Coming all the way down from the superintendent, he's really into using technology and incorporating new tools to use for our classes, which is wonderful because now we get to stay on the cutting edge of anything new that's coming out. The administration then follows his lead and makes sure we have the tools necessary and we get the training on those tools, so that's useful. In the school itself you have a wide variety of teachers who dive headlong into it, and love every piece they get. And others, you're lucky if they hook up the laptop to the overhead [projector].

This observation highlights Mary's perspective on gatekeeping practices at American High and the agency given to teachers to customize their instructional efforts. For Mary, this translates to a measured and balanced approach to technology use. She leverages technology resources to provide variety in her lessons, but only when there is a clear advantage to doing so. In daily practice, Mary is neither "diving headlong" nor apprehensive when integrating technology.

**Conclusion.** Mary's information ecology is largely shaped by her many years of experience as a classroom teacher. She is comfortable with her approach to teaching and learning, and she confidently plans and delivers lessons that consistently lead to students' success on the SOL test. Though her approach is less reliant on technology than Martha's approach in Case One, Mary recognizes the value of using technology as an ongoing aspect of her instructional program. In Case Three, Paul teaches within an information ecology in which the role of educational technology is actively taking shape.

### **Case 3: Paul's Information Ecology**



Paul has learned to continually refine his approach to teaching and learning during his first full year as a high school social studies teacher. Paul joined the faculty of American High School halfway through the previous school year, and he quickly accepted the challenge of acclimating to a new teaching position in the middle of an academic year. Now in his third semester of teaching US/VA History and World Geography, Paul builds on his experiences in the military and strives to develop well-structured and effective lessons that provide a consistent approach to teaching history at the survey or introductory level.

A typical lesson in Paul's courses includes independent classwork, a mini-lecture delivered by Paul, and a whole-class activity involving primary source images or other media. In the lessons I observed, students seemed to know this routine as they easily progressed through the class without the need for questions or clarifications. Paul requires students to keep a notebook with teacher-provided notes and graphic organizers that align with the textbook content. Though students must complete these notes on their own, Paul posts a complete set of notes on a shared network drive for students to check their work at the end of an instructional unit. On most days, Paul uses classroom technology such as a teacher computer connected to the multimedia projector and speakers to display and discuss the content. Students are permitted to use their own devices for classwork and other assignments, but only when instructed to do so. Throughout the various aspects of Paul's lessons, I observed an amicable teacher-student relationship characterized by students' willingness to ask for help when needed and Paul's attention to individuals as he provided one-on-one guidance to several students.

Overall, Paul's classroom thrives on this strong teacher-student relationship and the predictable nature of teaching and learning built on routine and consistency.

Paul's dedication to planning effective and practical learning experiences in his teaching contributes to his desire for collaboration, student rapport, and educational technology integration. Paul's information ecology both shapes and reflects these efforts. The following sections examine the central aspects of Paul's teaching context as an information ecology.

**People in the contested classroom space.** Paul values a collaborative and relational approach to encountering people in his classroom space. He approaches collegial and student relationships with teamwork in mind as he seeks to leverage those relationships to help him create an effective learning environment. Paul explains,

[In my office] we've got everybody. There's a couple of us in social studies and English here. But it's fun. It's a great mix. Lunch time is great conversation.

There's English and literature, and politics, and talk all between. So it's a great cross-breeding. And some of the other colleagues here, we teach the same kids. I teach them one day in social studies, and then they're matched with the other English teacher, and she teaches them on the other day, so we exchange ideas.

Paul builds from collegial relationships to inform his interactions with students. He wants to include them in the daily happenings of the classroom. He seeks to connect with them and learn their interests. According to Paul,

the biggest factor for the students is the teacher, and the interpersonal relationship of the teacher. Do you generally like the students? Do you show that in a positive way, in a supportive way? [If so], now I've got an in-road. So if I can make these

little plug-ins and connections with as many students now, they become friends.

Now they take care of you.

Paul gains valuable insight on how best to teach his students by taking a genuine interest in the experiences and perspectives of others in his classroom space. This approach can be observed during in-class interactions with students and colleagues.

In each of the classes I observed, Paul dedicated a portion of his class to working with individual students to check on progress, discuss assignments, and remind them of expected work. While the other students in the class were expected to make progress on independent assignments, Paul conversed with each and every student who had a question or was missing an assignment. Additionally, Paul regularly interacted with a special education co-teacher in the class. In between classes, during lunch, and during planning times, Paul could be found conferencing with another teacher or sharing experiences with a colleague in another discipline. These consistent person-to-person interactions demonstrate Paul's commitment to a classroom space that does not focus on him alone, but on students and colleagues who make the larger context of American High an effective learning environment. As such, Paul's classroom space is not contested by the presence or involvement of people. Instead, these relationships influence his instructional decisions and gatekeeping practices to be inclusive of multiple perspectives.

**Gatekeeping practices.** Paul focuses his curricular-instructional gatekeeping on efficient pacing and consistency. Accordingly, he views his survey history courses as introductory classes intended to provide a basic understanding of the content area. Paul explains this necessary focus with the analogy of an aerial versus on-the-ground exploration.

Every unit has words, and I have to make sure those words get mentioned or somehow we've covered them. And in American history, there is a lot. This course is a survey. I'm up in the plane going over it. I'm not down on the ground coming through the weeds. I'm just pointing out the landmarks.

Paul's approach focuses on basic knowledge and key concepts rather than "the weeds" of deep inquiry into history. Paul's gatekeeping practices support the survey approach to learning history. He wants students to know the key facts and concepts required by the curriculum framework because "it governs where you're going and what you're doing. You have got to make sure you're covering that content." Paul's approach is enacted in the classroom through a variety of teaching and learning activities, including graphic organizers that accompany the textbook, exposure to primary source media (e.g., images, newspaper articles, and speeches), and regular mini-lectures of 15 to 20 minutes to review content and highlight important concepts.

Paul requires students to use the assigned textbook and related activity pages to document key ideas from each text section. The activity pages are comprised of graphic organizers, terms to define, and practice questions. Before the end of the unit, Paul displays the correct answers to the activity sheets to be sure all students have access to accurate information. I observed all students completing these activities at varied levels of pace and focus. However, all students were aware of the importance of the daily activities, as evidenced by their attention to detail and completion of the assignments, and the need to recall the information on unit tests and the end-of-year SOL test. Additionally, Paul gave mini-lectures on important concepts and displayed primary source images and documents to illustrate his points. Both of the aforementioned

activities focus on the basic understanding and recall of key facts that will help the students succeed on future assignments and the SOL test. Paul's emphasis on simple and utilitarian activities exemplifies gatekeeping practices that manifest in manageable learning experiences for all students. However, these practices are supported by a specific set of values in which Paul firmly believes.

**Gatekeeping values.** Paul believes in positive relationships, rigor, and goal setting. In Paul's classes, education is about effort, not entertainment. He characterizes this perspective as somewhat at odds with other views.

Sometimes, learning is not fun. It's necessary. Yeah, we can try to dress it up and make it [fun], but sometimes there's just days when the rubber meets the road and so that's the only thing I get concerned with. Today's students, do we miss that in our efforts to be engaging and fun and all of that?

Paul believes there is an opportunity to instill the values of hard work and goal setting in his classes. As a result of these values, Paul does not shy away from assigning work that students do not perceive as fun. According to Paul,

That's the crossroads we're at now as educators. Trying to engage, trying to make it [fun], but yet instill that, traditionally, there are just some things you have to learn; there's no way to make it exciting. Some teachers do that better than other teachers. Some teachers have a proclivity, a natural innate ability to make some things [fun] with their personality. And then other teachers, the only way they know is to drive it straight home. I fall in the middle. How can I do both? Keep the content but still try to make it relevant.

Paul's balance of rigor and relevance relies heavily on the goal-setting value he promotes with his students. Through the positive relationships and strong student rapport he has developed, Paul consistently reinforces the necessity of meeting expectations in his class as one piece of the larger goal of a practical education.

Paul recognizes students have varied perspectives and values concerning their approach to school and his class in particular. He encounters this variability with consistent effort to meet students where they are in terms of interests and goal setting. When describing students who come to his class with a pattern of underachieving in history, he emphasizes the value of goals setting.

You don't have to love history. You don't have to like it. Just come in here and do right now. For some kids, I just focus them on an immediate goal. Your immediate goal is to get through this class. You're a junior, and you're trying to get to be a senior. So if that's the only thing that can motivate you, great. Just get through this; just fulfill this so you can graduate.

Paul's focus on immediate and practical goals encourages students to do what is necessary to succeed, even if they do not enjoy every step in the process. Paul sees reward in this approach, even if that reward is not immediate.

I know I'm putting stuff in them that is going to come out later on. They don't know it. I know it. I know that later on they'll be somewhere and they'll be like, *Wow, my social studies teacher taught me this*. So, that's the thing that has to bore you along on those dark days when you're like, *Man, they're not getting it! Why?* Just keep feeding them. Keep teaching them because it will make a difference later.

Herein lies Paul's justification for emphasizing rigor and relevance over fun or entertaining teaching and learning, regardless of students' perspectives on the content. The long-term value of setting and achieving goals carries lifelong implications that extend beyond the content. As a consistent and encouraging presence in students' lives, Paul hopes to provide a classroom experience in which students can flourish.

Gatekeeping values in Paul's information ecology influence his instructional decisions and provide a shared vision that he and his students work toward. Paul describes his teaching efforts as in development, but he is firmly committed to providing valuable experiences. Paul explains,

My priority is to just try to make sure each day that I'm moving them along. I think right now, in this...my early first years...it's just kind of mastering the trail of how I lead kids through the instruction. I just try to broaden their experience and try to get them as best prepared for their SOL test. So can I still challenge them, not the same way they would in an AP class, but still I can push them, and challenge them, and make them work as well, too.

Paul navigates the dual challenge of honing his craft as a teacher and providing consistent opportunities for student learning and achievement on the SOL test. His gatekeeping values align with his gatekeeping practices, though his practices are still developing, especially as they relate to educational technology. Paul believes the current and upcoming availability of technology resources will help him continue to develop his approach.

**Technology in the contested classroom space.** Students' experiences in Paul's classes regularly include technology tools and resources such as student devices and

school-provided laptops. However, the role of these tools and resources is still developing in Paul's approach to teaching and learning due to the current and upcoming availability of technology. Paul would like to use technology to help him use less paper-based activities, make fewer copies, provide a broader range of resources for students, and help students take more ownership of the learning experience. Paul views all of these possibilities as near-term options as American High and the district as a whole move forward with implementing the cloud-based file storage and delivery system Microsoft Office 365.

We just adopted the Microsoft Office 365 and the One Drive so that allows you to take all your files and put them in a place where you can get them on your computer. You can get them on your iPad. You can go home and work and upload stuff, so that seems [really] interesting. I can create it, and put something up.

Instead of printing it...so I think our school division is on the right track.

Paul believes easier access to information and materials will overcome common barriers to students taking responsibility for their organization for learning. Given the somewhat limited and time intensive access to computing hardware at American High, Paul often allows students to use their own devices to access assignments, grades, and supplementary materials.

In classroom observations, I noted students frequently using their own devices in order to individualize their work and pace. Paul described an advantage to the BYOD approach when referencing a past lesson in which Kahoot, a web-based quiz game, was used to encourage individual participation.



They're up and cheering and having a great time. Plus they're learning and then there's a way I can hold them accountable. I can see which questions they answered, the answer they put in, and what they got right. So I can use that to inform my decisions. They like it. They're learning something even though they don't think they're learning.

This experience is possible due to the prevalence of personal devices used by the students. Nearly all students had their own device, either a smart phone or tablet, and could easily participate in the activity. Paul believes a school-provided device for each student would encourage more technology use. In his words,

I think they're moving to being able to have devices in the hands of the kids.

Right now we have labs that you can sign up to get. They have carts you can bring to your room and let the kids use the laptops, but if each teacher had their own little collection of iPads and stuff that you could just pull out and use at any time, it would be even better.

Paul anticipates greater access to computing devices for students, but he is unsure of when it will take place. In the meantime, student-provided technology occupies a dual role of enabler and distractor. When discussing the BYOD policy at American High, he reports "they'd rather [use their devices] than to sit there and listen to me. And it's a fight because the school system is generous and gives them this bandwidth and now we have to fight and compete with it." Despite the perceived value of a student wireless network and generous BYOD policy, Paul must balance the affordances and constraints of these resources in an information ecology that is still in development.

Technology in Paul's information ecology is an important part of teaching and learning experiences. The upcoming adoption of Microsoft Office 365 will provide opportunities for Paul to use more digital resources and enhance the learning experience. However, the potential challenges inherent with students using their own devices are constraints in the contested classroom space. Paul recognizes the value of easily accessing digital information and regularly using technology tools, but shows some apprehension when discussing these changes.

We need to do a better job teaching etiquette with these devices. Our students are digital natives. It's 2016; students are used to electronics. That's all they've had. That's all they want to do...I'd rather have a button where I can come in when they come in, push it, and kill the bandwidth. [When needed] I'd say, "Ok, pull out your phones." And I would turn it on.

Paul's desire for greater access to and greater control of technology, including student devices, reflects his aspirations for more consistent technology use. As the available resources increase at American High, Paul plans to augment his approach to be more digital and promote more flexible and individualized teaching and learning.

**Analysis: A developing information ecology.** The people, practices, values, and technology in Paul's teaching context reflect a developing information ecology with many opportunities for changes. The following sections explore the relative health of Paul's information ecology in terms of system, diversity, coevolution, and keystone species. These characteristics illustrate the unique information ecology that currently exists in Paul's environment while highlighting the ongoing development of Paul's approach as a relatively new teacher.

**System.** The systematic nature of Paul's information ecology is characterized by routine in both instructional approach and expectations of students. As a system of interdependent parts, any change to one aspect of an information ecology can alter the character of the whole (Nardi & O'Day, 1999). In Paul's case, he approaches whole instructional units and individual lessons with similar routines and expectations. In doing so, the system operates consistently without major changes that could disrupt that status quo. Paul is clear in what he intends to accomplish in his lessons and, in turn, the students have a clear understanding of what is expected. Though the ecological system is characterized by routine, Paul makes particular efforts to ensure this routine is accessible and helpful to his diverse group of learners.

**Diversity.** The diversity in Paul's information ecology is prominent at the student level. Paul encourages, and even invites, students who experience difficulty in other history classes to join his. Administration has joined him in this effort because of the strong rapport and relational approach evident in Paul's classes. Paul believes embracing diversity is an important professional aspect of his teaching. He describes the inclusion of all students, regardless of past achievement or behavior, as a necessary challenge.

Kids get moved to my class. [Administration] will say, *We'd rather have so-and-so in this class. Is that all right with you?* I say bring 'em. *This kid is having difficulty over there. We figure if we put them with you, they'll be all right.* Bring 'em on. So I've gotten a lot of that. I'm kind of the go-to. I'm all right with that. That's great. I like that challenge, because a lot of the time they just need to be taken care of.

Paul's acceptance of students with a variety of abilities and varying levels of classroom behavior fuels his approach to the strong student rapport discussed earlier. This diversity necessitates Paul's routine of individually paced assignments and allowance of multiple technology devices during class. He is inclusive of students' abilities and interests, and he is open to refining his instructional routine. This perspective allows for coevolution in an information ecology that balances routine and diversity.

***Coevolution.*** Paul's information ecology is dynamic. Despite his value for routinized instruction and student expectations, Paul finds value in trying new tools, assignments, and approaches as he refines his pedagogical approach. Therefore, the teaching and learning experiences coevolve as Paul gains experience and students adapt accordingly. Paul illustrated this coevolution when describing an organizational change regarding students' use of content notes and the textbook.

[Last year] I hardly touched the textbook. This year [I realized] they need to get the book. I can't give up on the book. So this year I require notes. So I make them go to the book, then listen to me, then try to do some different learning. Do some maps or do [another activity].

Though Paul requires use of the textbook, he encourages students to access the text in a way that works well for them. Online access to the book is available, as are traditional hardback textbooks in class. Additionally, Paul scans required chapters and posts them to a shared drive for students who might benefit from offline access. In my observations of Paul's classes, I noticed students using each of these paths to access and use the textbook. As Paul further develops his pedagogical aims and instructional methods, his information ecology is likely to coevolve to adapt to those changes. As a new teacher, Paul values the

collegial relationships and professional agency that stimulate his development as a teacher.

**Keystone species.** Paul's approach to teaching and learning would not flourish without the collegial relationships he fosters at American High. Paul's professional colleagues are the keystone species in his developing information ecology. Paul develops collegial relationships with other teachers in his shared office as well as other teachers in his content area. Paul describes these relationships as valuable for learning about his students and intercepting behavioral issues.

The students I see on *A* day, [the English teacher] sees on the *B* day, and vice versa. So we come and collaborate. *Hey how are they for you? What have they been doing for you? How's their behavior?* So we bounce things back and forth between each other since we share the same pool of kids. We talk about what's going on and what's happening. So that collaboration is really helpful.

Paul actively collaborates with teachers outside of his content area. Similarly, he recognizes the value of learning from experienced teachers in his discipline. He approaches this aspect of relationships as a way to learn new or innovative instructional approaches. Paul describes this as an ongoing discussion.

One of the other teachers [who] teaches World History and Geography is [in this office], so we're a content team as far as Geography. She's a more senior teacher. She's been here longer. So I'll be like, *Ok, what you got for this? I'm on this.* And we'll check each other. She has a bit of a different route that she walks her kids through the subject, and I have a different kind of route that I walk, but we both

kind of share and collaborate and she'll give me some good lessons and we work together.

Ongoing conversations continue to develop Paul's collegial relationships and inform his instructional decisions. Paul's willingness to reach beyond the boundaries of his own classroom and glean information and practices to strengthen his teaching exemplifies the significance of the keystone species in his information ecology.

Paul's teaching context, as described and interpreted through the Information Ecologies framework (Nardi & O'Day, 1999), provides a thorough examination of instructional decisions and the role of technology in his classroom. From this point of analysis, the following themes emerged in light of the research questions.

**Meso-level contextual factors actively shape Paul's approach to teaching and learning with technology.** As a new teacher at American High, Paul's instructional decisions are significantly influenced by meso-level, or school-level, contextual influences. These influences manifest primarily in two of the three areas discussed in Chapter 2: interpersonal and curricular factors.

Many interpersonal factors influence Paul's general decisions. Paul values relationships with colleagues and a strong rapport with students. However, the supportive nature of administrative relationships influences Paul's desire to try new approaches that embrace available technology resources. Paul describes the administration at American High as supportive and trusting. He noted, "I think [administrators] really appreciate each teacher's individuality and their expertise and their knowledge. Meeting the standards, but maybe sometimes rearranging things to fit their teaching style." Additionally, the administration tries to encourage new ways to incorporate technology, especially to

reduce paper use and limit the use of worksheets. Paul accepts this challenge by leveraging district-wide technologies such as shared network drives, the online portal for student grades, and web-based applications. Additionally, Paul is eagerly awaiting the implementation of Microsoft Office 365 so he can further digitize his resources and make his lessons and materials more flexible and accessible. These decisions are influenced, in part, by the expectations set by the administration and the curricular goals inherent in following the state curriculum framework.

Paul views his approach to the survey history courses as utilitarian. He wants to help students meet their goals as well as gain confidence to succeed on the end-of-year SOL test. When asked about his position on standards in the curriculum framework, he states,

We need them. We have to have them. Standards are important. Standards are a compass. We can't teach you everything, but, hey, you need to reach minimum. You need to know this. You need to be exposed to it; be aware of it. Whether you just go work at the shipyard or you go into some other high-level [vocation], you just need to be aware of our history. So we need those standards for us as teachers so that we can all kind of hold each other accountable. That there's some standard that we have to reach and some standards that we kind of push the students towards.

Paul's adherence to the curriculum framework undergirds his instructional decisions regarding technology use. As described earlier in Paul's use of the web-based application Kahoot and online student notes, Paul uses technology to engage with students and provide them with the baseline knowledge necessary to grasp the standards in the

curriculum framework. Though he capitalizes on existing technology resources at American High, Paul believes the impending upgrades to district-wide technology resources will be transformative for his teaching and students' learning.

**Sufficient support and resources for educational technology tools will provide pathways toward student-centric, technology-enhanced instruction.** Current levels of technology integration in Paul's classes are influenced by limited school-based resources and inconsistent student access. Paul strives to meet students where they are in terms of organization, past achievement, and access to material. He scans resources as needed, makes hard copies often, and avoids the difficulty of reserving a lab or laptop cart by asking students to use their own devices. Paul plans to save time and effort by creating and storing resources digitally by using a cloud-based solution for organization and resource sharing. He envisions many advantages to a digital approach, including linking to existing resources, increasing access to materials for absent students, and more personalized interventions for students who need help. Paul often says he wishes he could go "all digital" as he explains the many advantages:

I'm going to put more stuff out there. I can put it in a digital book, which all of the students will have access to. [I can] post the questions online and have them turn in their answers on notebook paper. The [online textbook] access that they can get at any time, 365, 24 hours a day. If they go on a trip, pull it down online from the cloud and do your work there. And you can do it in real space and then email it to me. If you forgot and it's late and it's Sunday night, email it to me and I can have it graded. So that kind of thing will help a lot.



Paul's instructional decisions in an "all digital" teaching context would be markedly different than his current approach. Though Paul focuses on building rapport and helping students reach goals, his current approach to delivering content is primarily teacher-driven. All students receive the same assignment, have access to the same resources, and are expected to take the same assessments. However, Paul believes better access to digital resources and the infrastructure to support it would change his instruction and provide a path to more student-centric teaching and learning. Personalized digital spaces, easily shareable digital sources, and customizable media access are areas of interest to Paul, but they are not yet a reality at American High.

**Conclusion.** Paul's developing information ecology is significantly shaped by meso-level factors. Though he anticipates new instructional capabilities spurred by future technology investments at American High, Paul's current teaching context does not fully support his aspirations for teaching with technology. In contrast to Mary, Paul anticipates significant changes to his instructional approach as his context changes.

The three participants in these cases do not evaluate the larger context of American High School the same way. The common educational environment shared by Martha, Mary, and Paul provides a useful backdrop for exploring the unique teaching contexts of their three cases. Similarly, examining the commonalities among the cases illuminates the complexity of contextual influences on instructional decisions. The following sections discuss the cross-case analysis and related findings in order to examine the intersection of shared contextual influences and unique information ecologies.

## Cross-Case Analysis

The previous presentation of cases described the complex and unique teaching contexts of the participants in terms of information ecologies consisting of people, practices, values, and technology. These descriptions supported characterizations of the system, diversity, coevolution, and keystone species present in each information ecology. Table 1 summarizes the differing aspects of participants' information ecologies as well as the overarching quality that characterizes the health of each information ecology.

Table 1

### *Summary of Participants' Information Ecologies*

| <b>Participant</b> | <b>People</b> | <b>Practices</b>               | <b>Values</b>   | <b>Technology</b>                           | <b>Characterization</b> |
|--------------------|---------------|--------------------------------|---|---|-------------------------|
| <b>Martha</b>      | Parents       | Student-centric                | Preparation for 21 <sup>st</sup> century work               | Inadequate resources                        | Challenging             |
| <b>Mary</b>        | Teacher       | Balance of routine and variety | Adhering to the curriculum framework                        | Adequate for didactic use                   | Efficient               |
| <b>Paul</b>        | Colleagues    | Teacher-guided routine         | Goal setting and rigor to navigate the curriculum framework | Relies on BYOD while awaiting new resources | Developing              |

Though each information ecology is unique, similar environmental conditions and influences exist. Participants share the common environment of American High School and the various resources, limitations, strengths, and weaknesses inherent in a school.

However, these conditions do not always manifest in the same way in each teacher's context. The influence of American High School's environmental conditions varied in each case depending on the quality of the information ecology. In the following sections, I present themes that emerged from cross-case analysis and discuss how the themes are characterized differently in each participants' case.

**Theme 1: Gatekeeping freedom is attributed to, and governed by, the high achievement of American High School.** All participants described their freedom or agency to gatekeep as highly autonomous. Gatekeeping was defined for participants, in each interview, as the day-to-day enactment of the curriculum in their classrooms and the ongoing decisions they make to shape their instructional approach (Thornton, 2005). This concept was addressed in each interview and led to consistent discussions about the link between American High's students' performance on state assessments and federal benchmarks and teachers' freedom or professional judgment.

Participants uniformly characterized their gatekeeping freedom as highly autonomous and free from administrative intervention or prescribed activities. This characterization proved important in each participant's information ecology as they conveyed confidence in their instructional approach and significant agency in leading their students. As a result, the participants make instructional decisions based upon their own interpretation of priorities and pedagogical preferences. They recognize the freedom to collaborate when they want to while simultaneously valuing the independence to run their classrooms without interference. However, this juxtaposes the significant role of the state curriculum framework and corresponding end-of-year SOL test. Though the participants did not characterize the curriculum framework as interfering with their goals,

they did recognize the correlation between high achievement on the SOL test and their gatekeeping freedom.

Participants share the common environment of American High School's year-to-year success on state and federal benchmarks. They recognize that they are in one of the top schools in the nation when considering metrics such as state testing achievement, graduation rates, course offerings, and college-bound graduates. This record of success both supports teachers' gatekeeping autonomy and sets a clear expectation for continued success. There is sense that the autonomy might change if the success levels lowered. Martha's remark that "scores are everything, and ours are at the top" illustrates her recognition that continued achievement on standardized metrics are more important than refining current instructional approaches or procuring more resources. This perspective is noted in all three cases, yet it manifests itself differently depending on the character or health of the information ecology. The following sections thread this common belief, the link between gatekeeping freedom and school-wide success, through the lens of unique information ecologies.

***Martha's challenging information ecology.*** For Martha, agency to gatekeep is described as a strength for the teaching experience and a detriment for collegiality and innovation with technology. In her words:

There's no oversight in this building at all. I could do or not to do whatever I want to in the building. At the end of the day, what I've learned about [this system] is they don't care how you arrived at the finish line, as long as the finish line number is about 90%, they don't care. As long as in May, I do whatever has to be

done to make sure [students] pass that SOL. It's really all of it...There is no requirement to write a lesson plan. There's nothing that I have to give anybody. Martha describes this lack of oversight, and resulting gatekeeping agency, as a potential danger to progress because no one sees areas for improvement. This is directly linked to her perspective on the inadequate technology resources at American High.

Martha believes there is no impetus for change at American High School. In short, there is nothing broken, and therefore nothing to fix. I observed a class in which network challenges caused students to shuffle computing devices from school-provided laptops to BYOD options. In our conversation afterwards, Martha summarized her perspective,

Technology is viewed as a solution, but there is no problem [here]. However, we don't view technology like that in our personal lives. In our personal lives, technology is an aspect of life and it is integrated into everything we do. That's how we should approach it in school.

Martha views technology as more than a tool to solve problems. She sees technology as an integral part of society and should be treated as such in the school setting. As a result, Martha's gatekeeping is simultaneously freeing and constraining. Her information ecology is challenged as a result of the success she is expected to help maintain. Martha recognizes this duality and feels frustrated because her gatekeeping freedom is bound by the resources available to her, and those resources do not align with her values. Martha believes gatekeeping involving educational technology should be anchored in rich resources and teacher collaboration. This view stands in stark contrast to Mary's perspective of gatekeeping based on established patterns of success. They both want to

support the continued success of American High, yet their gatekeeping diverges when considering the question of adequate resources.

***Mary's efficient information ecology.*** Mary contends there is a direct correlation between the tradition of success at American High, in terms of accreditation and federal benchmarks, and the high agency afforded to teachers to govern their classrooms. From Mary's perspective, her gatekeeping freedom is perpetuated by her track record of success in guiding students toward high pass rates on the state SOL test. She explains,

Because we are allowed so much freedom in what we teach, I use the SOLs as my guide. Because that is what we need to teach. The information. But how we get the information to the kids [is our choice]. In general [administrators] are very supportive of what we do.

Here again, the duality of defined expectations and gatekeeping freedom is present. Mary does not observe this duality as contentious because she does not have a desire to make curricular gatekeeping decisions outside the scope of the state curriculum framework. She finds confidence in the established instructional routine that leads to students' success from year to year. Although the measure of success is limited to standardized strands of information recall on an end-of-course SOL test, Mary views her freedom to shape instructional delivery and classroom experiences as fulfilling. This perspective is similar to Paul's approach to gatekeeping in a developing information ecology that focuses on student rapport and goal setting, while adhering to the necessary curriculum strands dictated by the curriculum framework.

***Paul's developing information ecology.*** Paul views his gatekeeping freedom as a result of the professional culture of American High School. He has heard of teachers

resisting administrative efforts to promote common planning and assessment, but has not experienced those efforts during his time at American High. Like Martha and Mary, Paul links this teacher autonomy to the overall success of American High. He explains this by comparing American High to his previous school in a different system, where he was a student teacher and experienced an administration that was more actively involved with instructional decisions.

They haven't met SOL's. They haven't met AYP, so they try to do that. Try to line everybody up [and require certain instructional approaches]. But here, we're small enough that they haven't done that. And the teachers here are great teachers. A lot of them are board certified so they fought that because we do get the results. Here at this school, nobody's even close to us. As far as this school and the other school, as far as our results. We get good results. So the teachers fought and they said, *No. Respect us as teachers. Let us do our thing.*

Paul references respect for teachers' autonomy as a unique characteristic of the American High School environment. He believes administrators should take confidence from the success of American High and demonstrate that confidence by affording significant freedom and autonomy to teachers' gatekeeping. However, in Paul's developing information ecology, this confidence is still forming as Paul builds relationships with administrators and colleagues.

Paul strives for open and ongoing dialogues with his teacher and administrator colleagues. He welcomes new ideas and works hard to demonstrate his efforts. He believes his efforts have resulted in unusually high administrative confidence in him as a new teacher. He states,

I've been given a lot of room because [administrators] feel like I'm a professional and a colleague. [They know] that I'm going to come to work and do the right things and show up. I think I gained that trust from the people that I work with and the other folks.

From this point of confidence, Paul is comfortable trying new ideas and developing his instructional approach from year to year. In contrast to Martha's interpretation of an administration that lacks innovation or drive to improve, Paul and Mary perceive the administration as respectful of teachers' professionalism and record of success.

All participants noted the exceptional freedom and autonomy they experience in gatekeeping. They feel at ease in making instructional decisions and assessing their students' success. All participants attributed this freedom to America High's long record of success. However, the influence of gatekeeping autonomy and freedom does not directly translate to freedom to navigate content or stray from the survey approach to teaching history. Accordingly, the participants seek to take that path that most closely aligns the curriculum framework with their educational orientation and resources for making instructional decisions. This path is determined by their professional preferences and overall pedagogical aims. As long as available resources align with their preferences and aims, the participants do not feel constrained by their contested classroom space. When considering decision-making regarding educational technology, all participants experienced varying levels of constraint.

**Theme 2: The lack of robust technology resources contest participants' classroom spaces.** All participants perceived educational technology as a necessary and valuable tool for teaching and learning. In most interviews, participants mentioned the



upcoming adoption of Microsoft Office 365, planned for implementation next academic year, as a move forward in providing necessary technology resources. Despite the varied perspectives on the school system's emphasis and value of educational technology, all participants discussed room for improving technology resources, thereby allowing more consistent classroom applications.

***Martha's challenging information ecology.*** Martha's perspective on technology illustrates the significant lack of technology resources and the influence on her contested classroom space. In her view, such resources are not limited to hardware and software, but include leadership resources for demonstrating and encouraging effective technology use. When discussing this shortcoming, Martha explains the contrast between past ways of teaching versus teaching effectively with technology.

Coming to this division, I was kind of expecting [vast technology resources] considering the reputation of the division, but this division is very behind the curve. They have very limited laptops for the students. The one the teachers have rarely ever work, the network is always down, the classroom technology is spotty. Most of the time it's just the old-fashioned whiteboard and dry erase marker. Very heavy into textbook and worksheet use because it's really what they had access to.

Martha's comparison of her prior and current school systems is anchored in her value of and experiences with technology in an information ecology that heavily relies on technology use for teaching and learning. As a result, Martha's classroom space is contested by the lack of resources to support her pedagogical aims. When asked why she continues to strive to find ways around the limitations of her context instead of

augmenting her approach, Martha replied, “I don’t believe in the 1950’s way of doing things.” Martha is resolute in finding ways to practice pedagogy that aligns her view of relevant technology skills.

***Mary’s efficient information ecology.*** Mary plans lessons that conform to the available technology in her teaching context. Though she is willing to try new instructional procedures that leverage unfamiliar technology, Mary tends to focus on established lessons that have proven successful in the past. As a result, Mary leverages student-centered technology, such as individual computers or tablets, less than teacher-centered technology such as the multimedia projector and screen. She observed declining computer lab availability this year and has to reschedule lessons and activities accordingly. Due to her routinized and efficient approach to planning, she is able to reschedule, but only to a minor extent before her pacing goals overshadow the desire for integrating technology in a particular lesson. Mary characterized this inconvenience as a “minimal limitation,” though she recognized the need to plan at least two weeks in advance to increase her chances at accessing the appropriate technology resources. Mary’s classroom space is contested by the lack of robust and easily accessible technology resources, though this factor is less influential, and less constraining, than the same factor in Martha’s classroom space. Similarly, Paul encounters this contesting factor in such a way that he can still develop his preferred pedagogical approach.

***Paul’s developing information ecology.*** Paul views his instructional decisions as recursive opportunities to make necessary changes for the future. He utilizes some school-wide technology resources now, such as the student BYOD network and laptop carts, but he sees great potential for technology use next school year. Paul’s desire to go

“all digital,” discussed earlier, is currently inhibited by network limitations and hardware availability. The classroom space in Paul’s teaching context is contested by current technology limitations, but he is optimistic new system-wide technology investments will significantly improve his teaching approach. Because his information ecology is still developing, Paul views upcoming changes in a positive light and is ready and willing to adapt his instructional decision-making to take advantage of available resources.

These participants experience the contesting factor of technology resources in different ways, depending on the character of their information ecology. Their willingness to adapt to their technology environment varies depending on their value of educational technology and their preferred pedagogical approach. However, more access to technology resources, especially those that would support their general orientation towards teaching and learning, would likely enhance the use of technology in all three teaching contexts. The third emergent theme addresses these differing motivations for using educational technology, each anchored in a shared recognition that technology is needed to prepare students for real-world applications beyond high school.

**Theme 3: Educational technology is important in developing technology-related skills and habits for real-world applications.** All participants share a common view that educational technology must be used because it is relevant in today’s world. They recognize the ubiquity of technology skills in various careers and feel that teachers are, in part, responsible to help students encounter such careers. The importance of technology use to be relevant is most ardently supported by Martha, as reflected in her gatekeeping values and practices that try to reach beyond the curriculum framework. However, Mary and Paul recognize the need to address technology use, both in terms of

proficiency and etiquette, as a factor in their instructional decisions as well. Based upon the character of their information ecologies, the participants differ in how they process the significance of technology use as a lasting skill.

***Martha's challenging information ecology.*** Martha's primary purpose for frequently using technology in her classroom is the need to match 21st century skills with 21<sup>st</sup> century work and life. Martha explains her position as teaching towards a larger skill set that reaches beyond knowledge measured on the SOL test. She states, "our children are going to be 21st century workers so they have to have that piece. They have to know how to use technology in the workforce because everything is geared to that purpose." From this orientation, Martha makes technology-related instructional decisions that encourage students to use technology regularly. Martha assists students in obtaining email accounts, cloud storage, and other web-based accounts for useful applications. By leveraging these technologies often, Martha immerses students in technology resources for academics and communication. She believes real-world applications of technology should be the driver for technology adoption and use in her school system. Though the lack of resources currently makes this goal challenging, Martha does whatever she can to consistently leverage technology in her own information ecology.

***Mary's efficient information ecology.*** Mary views technology use as neither beneficial nor detracting from the classroom experience. She believes technology use should serve a specific purpose for the learning experience and for skill development. Mary recognizes the need for developing useful technology skills through a variety of platforms and applications. She characterizes her classroom as a place where students can safely learn these skills.

The world is becoming more technologically advanced and we need to be able to teach our students how to use all this technology so that when they get out in the big bad world out there, they have more skills and knowledge about all of this technology.

Similar to Martha's value for developing 21<sup>st</sup> century skills, Mary desires to develop students' knowledge about technology use beyond school. However, Mary views this as a collective responsibility that should be owned by the entire school. For her part, Mary is comfortable utilizing practical computer skills such as Microsoft Office, mapping software, and efficient web searches. This approach contrasts with Paul's perspective and his desire for students' to eventually learn in an "all digital" environment, yet shares his view of technology use as a necessary and practical skill.

***Paul's developing information ecology.*** Paul strives to demonstrate and leverage the utility of technology while simultaneously training students to excel in appropriately using digital resources. His efforts include attention to etiquette as he desires to prepare students for technology integration beyond a high school setting. He describes this preparation as necessary in college and the work force.

Technology etiquette is etiquette. We have to put back some etiquette and respect. If somebody's up talking to you, there's a certain respect that you should afford that person to listen to them, not have your headphones in. Not to be tuned out. This is something they're going to need if they're going to higher education or [the work force]... Even if they are just on the job and their employer is having a training session or doing something. The employer doesn't want to look out as see everybody on Facebook and YouTube. The companies now have rules. So we

need to bring that down to this level and start trying to teach and enforce that here. When students get out, they're going to have to have some kind of task discipline, self-discipline to help.

Paul is willing to take on the challenge of encouraging discipline and etiquette regarding device use. He models this approach storing his own phone during class and reminding students when it is appropriate to check devices. As a result, students know they will have times each day to interact with their phones and times when they are asked to store them.

Similar to Martha and Mary, Paul strives for developing skills regarding technology use. However, his focus on balance, etiquette, and respect appeals more to students' interpersonal relationships than curricular success. The value and necessity of embracing technology as part of the overall educational experience is common to all three participants. The in-class actions related to this value differ depending on the character and structure of the information ecology in each case. The perceived contextual influence of technology in a contested classroom space further illustrates the complexity and variability of teachers' contexts in a shared environment such as American High School.

## **Conclusion**

The findings of this study detail the overall contextual influences on the participants' instructional decision-making. The intersection of these decisions and the use of educational technology further illustrate the complexity inherent in exploring teaching contexts. The presentation of cases as information ecologies provided rich descriptions of each teacher's context and illuminated unique characterizations of their

ecology. Through examining the information ecologies, I described individual case themes that illustrated participants' interpersonal, organizational, and curricular contextual influences and how, if at all, these factors contested the classroom space in which the teachers act as curricular-instructional gatekeepers. Finally, I described the three themes that emerged from cross-case analysis and illustrated how similar themes influenced instructional decisions differently depending on aspects of the information ecology.

As with most qualitative research, these findings pertain to a particular time, place, and specific group. Findings are specific to participants' perceptions and are informed by their varied experiences and backgrounds. Though the findings are not largely generalizable, they do provide insight to other inquiry efforts in similar contexts and contribute to the existing body of literature. Additionally, these findings give rise to other questions about how context may influence instruction and what aspects school-level and government leaders and policy makers should consider when shaping curriculum and allocating resources. In the final chapter of this study, I will address possible implications of these findings, both as a contribution to existing literature and a point of insight for educational and governmental leaders.

## **Chapter 5: Implications**

This study explored the perceived contextual influences on teachers' technology-related instructional decisions. Using a multiple case study design, I researched three individual teachers' contexts shaped by the teachers' perceptions, experiences, and decisions in a single high school environment. I approached the study through the conceptual lenses of teachers as curricular-instructional gatekeepers (Thornton, 2005) acting within a limited or contested instructional space (Craig, 2009). I utilized the Information Ecologies framework (Nardi & O'Day, 1999) to facilitate my description and interpretation of teachers' contexts as unique and complex information ecologies. I reported findings in the form of ecological characteristics and related themes that addressed the research questions in each case and across cases.

This chapter is organized by the research questions that guided my inquiry: How, if at all, does context influence social studies teachers' classroom use of educational technology? Specifically,

- a. How do teachers perceive the influence of interpersonal, institutional, and curricular context factors on their instructional decision-making regarding technology use?
- b. How, if at all, do teachers perceive contextual factors as contesting the classroom space in which technology related instructional decisions are made?



I answered these questions based on data from teacher interviews, observations, and artifact analysis. In summary, the data indicate strong preferences for utilizing educational technology in ways that reinforce or support teachers' educational, pedagogical, and personal values. I operationalized these ideas with the term *educational orientation* to capture the significance of teachers' interrelated beliefs and presuppositions. I found that teachers enacted their curriculum differently as they reacted to interpersonal, institutional/organizational, and curricular contextual factors. Similarly, I found that the common experiences of making technology-related instructional decisions took highly variable paths and resulted in different instructional implications depending on the intersection of teachers' educational orientations, individual teaching contexts, and pedagogical goals.

In the following sections, I will discuss the significance of key implications as related to the larger body of literature on teachers' contexts and instructional decision-making. Additionally, I will address the effects of these implications on the micro, meso, and macro layers of context and discuss related issues for educational leaders and policy makers, as well as recommendations for future research.

### **Discussion of Key Implications**

This study contributes to educators' understanding of teaching contexts by illuminating the interrelation of contextual factors and teachers' decisions at the classroom level. The cases in this study reflect the complex environments in which the teachers make instructional decisions, and underscore the significance of teachers' pedagogical preferences in their classroom contexts. Participants reacted to the confines of their teaching context as curricular-instructional gatekeepers (Thornton, 2005)

weighing interpersonal, institutional, and curricular context factors existing at the micro, meso, and macro layers of context. The resulting instructional decisions reflected the unique character of teachers' information ecologies and shaped the role of educational technology in their classrooms. Additionally, teachers' instructional decisions illustrated a variety of instructional approaches that did not consistently embrace technological affordances or inquiry-based learning as pedagogical norms.

**Educational orientation in social studies teaching contexts.** The instructional decision-making autonomy, or gatekeeping, found in these cases is primarily influenced by the educational orientation of each teacher. Participants' described their teaching contexts as largely shaped by their own goals, values, and preferred practices. As such, their orientation towards teaching and learning is a highly influential factor. This personalized influence is an educational orientation through which all contextual influences filter. Similar characterizations in the extant literature, such as pedagogical beliefs or orientation (Ertmer, 2005; VanFossen & Waterson, 2008; Yow & Swan, 2009), intellectual dispositions (Journell, 2013; Saye, 1998), or epistemic beliefs (Angeli & Valanides, 2009; Stoddard, 2010), support the significance of educational orientation in social studies gatekeeping. Participants in this study consistently perceived the influence of contextual factors through the lens of their educational orientations.

Participants' educational orientations influenced gatekeeping and determined the weight of potential contesting factors in their teaching contexts. Martha's educational orientation is anchored in value for engaging instruction and preparing students to be technologically proficient 21<sup>st</sup> century citizens. She approaches educational technology as an organic, inseparable aspect of her classroom and, therefore, perceives the resources at

American High School as severely lacking. Paul's educational orientation is anchored in setting goals and relating to students, while Mary is oriented toward successful curriculum coverage. They are more tolerant of the technology resources at American High, but recognize the potential of a more comprehensive approach. These conditions reflect Rosenberg and Koehler's (2015) view of teachers' contexts as that which surrounds a teacher *and* that which is woven together with the teacher.

Rosenberg and Koehler (2015) argued for consistent considerations of contextual influences in research to help educational theory to "bridge the gap from research to practice in schools and classrooms" (p. 468). This reflects conclusions from Straub (2009) and Hardy (2013) that linked technology-related instructional decisions to teacher's educational perceptions and complex contextual factors. Both Straub and Hardy called for more explicit explorations of contextual factors to expose the links between practices recommended in research and the actual pedagogical practices observed in classrooms. This study supports this path of inquiry and refines it by revealing teachers' educational orientations as an effective frame for capturing where theory and practice coincide or diverge. Participants in this study made instructional decisions characterized by their educational orientations and the resources available in their context. Direct links to research recommendations, such as inquiry-based methods or active learning with technology (Hicks & Doolittle, 2008), were not consistently evident across all three cases due to the agency and autonomy supporting participants' gatekeeping.

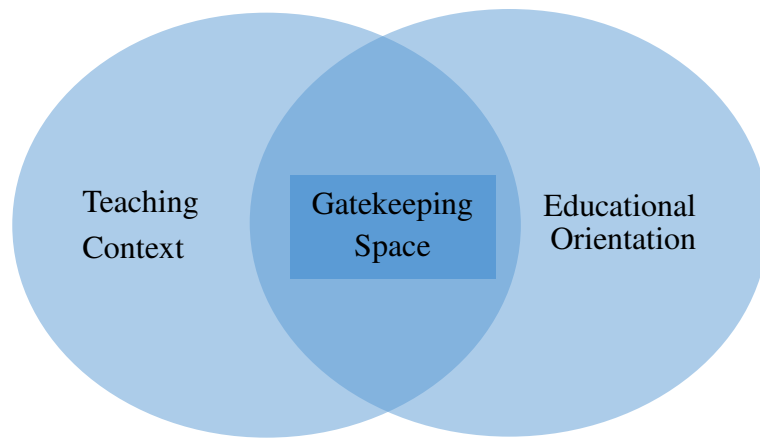
The autonomous gatekeeping explored in these cases simultaneously shapes, and is shaped by, teachers' contexts and educational orientations. The complexity of educational context means that instructional decisions and contextual influences are

inextricably linked and should not be explored exclusively or in isolation. Accordingly, the interwoven and external aspects of teachers' contexts result in pedagogical affordances and limitations unique to each teacher.

**Contextual pedagogical affordances and limitations.** Participants in this study perceived varying pedagogical affordances and limitations based on the curricular, interpersonal, and institutional or organizational influences in their teaching context. Their instructional-decision-making regarding educational technology simultaneously *reflects* these affordances and limitations and *shapes* the micro-context of their classrooms. For example, Martha views her high level of autonomy as a contextual pedagogical affordance to plan and teach as she wishes with no intrusion from administration or colleagues. Mary and Paul share this view and make instructional decisions accordingly. However, Martha perceives the overall acceptance of the instructional status quo at America High as a contextual pedagogical limitation that she must actively work around to gatekeep in accordance with her educational orientation. Paul views the same factor as an affordance for his rigorous and goal oriented approach to the curriculum framework, while Mary similarly finds the instructional status quo to be an encouragement for autonomous gatekeeping. These varying views translate to technology-related decisions that hinge on the centrality of the teacher and his or her educational orientation. Consistent with Ertmer et al. (2012) reference to teachers' preferences as the "true gatekeepers" of technology-related instructional decisions (p. 433), contextual pedagogical affordances and limitations permeate through teachers' gatekeeping.

Current literature on teachers' contexts and instructional decisions reflects these highly individualized views of contextual pedagogical limitations and affordances. Perfecto (2012) noted that teachers make adjustments to instructional goals and methods depending on students' needs, but such adjustments are narrowed by prescribed curricula. Lawrence and Lentle-Keenan (2013) explained the correlation between teachers' pedagogical decisions and technology use as dependent on teachers' perceived alignment between their educational orientation and available resources. The present study yielded similar findings, yet placed additional emphasis on the autonomous nature of teachers' gatekeeping as a result of maintaining high achievement on standardized tests. As such, the prescribed curriculum framework simultaneously narrows instructional practices and guarantees instructional freedom within the status quo. This duality exposes the difference between contextual factors that *influence* decisions and factors that *contest* the classroom space.

For participants in this study, the classroom space available for gatekeeping was unique to each teacher and was dependent on the extent to which their educational orientations aligned with the characteristics of their teaching context (see Figure 5).



*Figure 5.* Gatekeeping in the contested classroom space. As illustrated, gatekeeping space results from the overlap of teaching context and educational orientation.

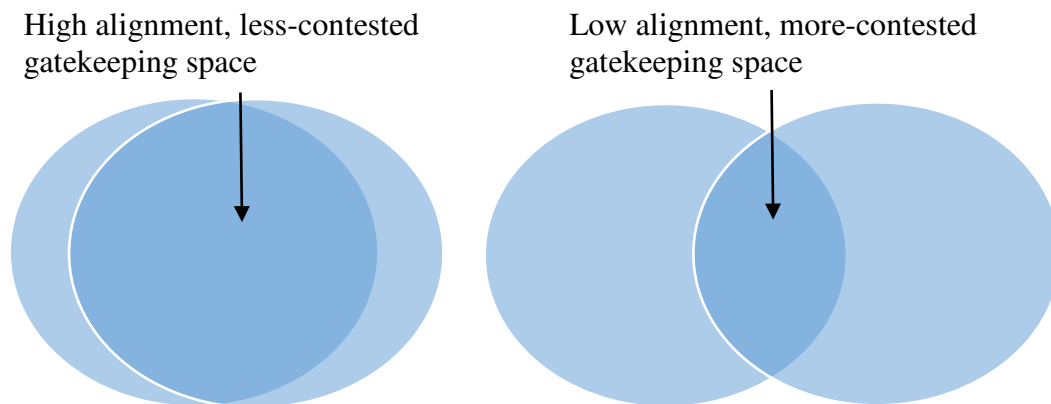
Though contextual factors influenced participants' instruction, not all factors contested the space available for gatekeeping. As discussed below, this space manifested differently across the three cases.

**Contesting factors.** Factors that contest the classroom space limit teachers' agency by introducing extraneous conditions for gatekeeping. Participants in this study did not consistently identify contesting factors that were apparent from my perspective as an outside researcher. Participants were unable to fully see outside of their own contexts and describe their decision-making holistically. My analysis revealed some contesting factors that that were unstated in interviews, yet apparent when considering teachers' actions and my classroom observations. These factors were inherent in teachers' contexts, yet not fully recognized by the teachers.

Participants identified overt and abstruse context factors that contested their classroom space and restricted their gatekeeping. For example, all participants recognized the limitations of building-level technology resources, yet they reacted to such limitations

differently depending on their educational orientation. Similarly, all participants acknowledged the necessity of a standardized curriculum framework, but they did not feel confined by its scope. Though none of the participants discussed the routinized instructional practices or instructional culture of their school as a contesting factor, there was a clear perception that all teachers were expected to do what was necessary to maintain the status quo of success at American High. As a result, participants perceived little or no administrative mandate to design engaging instruction or increase technology use.

These variations of contesting factors support the formation of unique yet dynamic teaching contexts for each teacher based on the level of alignment between teaching context and educational orientation (see Figure 6). Therefore, contesting influences on instructional decision-making involved the intersection of contextual factors and teachers' educational orientations.



*Figure 6.* High versus low context/orientation alignment. Gatekeeping space is perceived differently by individual teachers.

As illustrated in Figure 6, gatekeeping space is increased or decreased according to the level of alignment between educational orientation and teachers' contexts. For

participants in this study, only Martha perceived low alignment and a significantly contested space. Though Mary and Paul perceived higher alignment, they did so for different reasons. Mary valued the efficiency of planning instruction to match her resources. Paul prioritized coverage of the curriculum framework while actively developing his instructional approach within the instructional status quo of American High School.

Contextual factors that contested classroom space varied in significance across the three cases presented in this study. This characterization differs from Craig's (2005) portrayal of classroom space as "episodes of increased contestation" (p. 1043) in which entire schools experienced similar contesting factors carried out in similar ways in each classroom. Though Craig's narrative was intended to describe a wider view context, that of the meso and macro levels, the present study took place in a school system with a history of success and lack of formal state intervention. As a result, the micro-context of the classroom had less contestation across all three cases. Similar findings from DeWitt (2007) and Saye (2013) reflect the aforementioned implication that common or consistent contextual factors, such as prescribed curriculum or high stakes testing, have inconsistent influences on teachers' decisions. Furthermore, extant literature supports the implication of teachers' limited scope of reflection, often not extending beyond their classrooms, as a reinforcement to their educational orientations (Lawrence & Lentle-Keenan 2013; Perrotta, 2014; Plevyak, 2012).

Considering the variation of contesting factors from teacher to teacher or classroom to classroom, the role of technology is rightfully situated in the confines of teachers' educational orientations. The core of Nardi and O'Day's (1999) argument for



exploring technology as part of a human system, or information ecology, supports this conclusion. Nardi and O'Day explained:

Our leverage point lies in acting within the spheres where we have knowledge and authority. It may be that we will have the effect of shaping practice in our own settings with an extra measure of reflection and intention. (p. 56)

Though teachers are acting within their sphere of knowledge and authority, each sphere exists within the meso and macro contexts of their school and system. As such, a teacher's sphere of influence is shaped, in part, by factors beyond the teachers' reach. Examples include division-wide technology purchases and resource allocation that focus on teacher-centric technology use as opposed to student use. These decisions exist on the macro and meso contextual layers and reverberate on the micro contextual layer of individual classrooms.

Several researchers explored the multi-layered influences of learning environments and found a dichotomy between teachers' autonomous and reactionary instructional decisions (e.g., Chen et al., 2009; Ertmer et al., 2012; VanFossen & Waterson, 2008). Teachers as curricular-instructional gatekeepers enact the curriculum and react to curricular influences. They lead in their classrooms and follow the lead of administrators. They develop ideas for utilizing technology, yet are confined to the resources at their disposal. The dichotomy between autonomous gatekeeping and reactionary practices holds implications for those stakeholders that shape teaching contexts by way of leadership and policy formation.

### **Leadership Implications Across Contextual Layers**

This study contributes to our understanding of social studies teachers' instructional decision-making regarding technology by exploring the potential connections between teachers' contexts and gatekeeping. The findings address, in part, the familiar call to better understand the underutilization of educational technology in support of student-centered inquiry-based learning in secondary social studies classrooms (Beck & Eno, 2012; Saye & Brush, 2009). Given the complexity of teachers' contexts and the individual information ecologies that develop in teachers' classrooms, it is useful to explore the leadership implications of these findings in terms of the micro, meso, and macro contextual layers set forth in chapter two.

**The micro-contextual layer.** The day-to-day happenings and instructional routines of individual teachers' classrooms form the micro-layer of context. The participants in this study perceive the micro-layer of context as largely under their control and influence. However, when considering use of technology, teachers had somewhat limited access to in-classroom technology resources. This acted as a barrier towards more routinized use of technology for prolonged learning experiences and projects. Dedicated classroom-based technology resources, such as laptop computers or tablets, would ease this challenge and provide consistent access. Increased access to technology resources is often cited as an important step towards routinizing technology integration (Voogt, Erstad, Dede, & Mishra, 2013; Wozney et al., 2008), however many teachers view their current access to technology as adequate for their goals (Ertmer et al., 2012).

Teachers in the present study judged adequacy of technology based on their educational orientation, which led to technology use that was supportive of existing pedagogical goals rather than transformative. This micro-contextual reality is well

established in the literature (e.g., Ertmer & Ottenbreit-Leftwich, 2010; Glassett, 2007; Perrotta, 2013) and implies that the possibilities of leveraging educational technology to transform social studies pedagogy to be more active and inquiry-based begins with the transformation of teachers' educational orientation. Therefore, administrative support of an increase in successful technology-rich sample lessons, peer observations, and opportunities to collaborate within and across content areas are viable paths to expanding teacher experiences and changing their orientation as related to technology use. Any significant changes or improvements on the micro-contextual layer must start with aspirational changes to teachers' educational orientation. These changes can be supported by school and system leaders on the meso-contextual layer.

**The meso-contextual layer.** Implications for changing contextual influences on the meso-layer focus on school and system-wide leadership involving technology provisioning and support. Nardi and O'Day (1999) characterize leadership in an information ecology as an essential ingredient for setting and promoting values. For a school system to embrace technology as a pathway to transform pedagogy, leaders must commit to that value and support it with resources and infrastructure. Increased access to technology resources and empowerment of building level ITRTs to support teachers' technology use are important first steps on this pathway. However, to fully appreciate how their decisions influence individual classrooms, school leaders should include teachers in the technology-related policy decisions that shape teachers' contexts. What advantage is a BYOD network if it often fails? How can teachers leverage wireless networks if they are frequently overloaded by testing priorities? Why invest in system-wide software or web-based applications if there is inadequate hardware for teachers to

reliably build technology resources into their lessons? All of these practical questions are reflective of teachers' views in the present study and reflect the unrealistic expectations for transformative technology use documented in related literature (Song & Owens, 2011; Stein & Prewett, 2009; Tally, 2007).

School-level and central office leaders must include teachers' views on practical considerations when setting values related to educational technology adoption and use. Moreover, leaders must then support these values with adequate resources and personnel support to empower teachers to plan and implement technology experiences with confidence. Similar recommendations from Song and Owens (2011) and Beck and Eno (2012) reinforce this need for both the technology resources and the related leadership values that support and reflect teachers' viewpoints. Essential to this approach is the time and space to effectively collaborate and engage with teachers with different educational orientations. Rather than professional development workshops or technology initiatives that take a one-size-fits-all approach, district and school leaders should encourage tailored opportunities for teachers to observe and partner with their colleagues. Additionally, school leaders should value and implement teacher performance measures that align with aspirational educational orientations and pedagogical practices. Related scholarship supports this individualized approach to professional development through collegial relationships and teacher experiences (e.g., Ertmer, 2005; Ertmer et al., 2012; Glassett, 2007). Such localized and practical approaches to school leadership require the meso-layer freedom and autonomy to focus on bold yet incremental changes in local systems. Macro-layer contextual influences should encourage this autonomy rather than constrain it.

**The macro-contextual layer.** State and federal accountability measures shape teachers' contexts through an institutionalized commitment to measuring success based on state accreditation and federal benchmarks. In the present study, American High School met or exceeded all such benchmarks yet fell short, in the view of two participants, in encouraging rigorous and relevant pedagogical practices and educational technology integration. Standardized accountability strategies are implemented to encourage consistent achievement, yet they use fixed measures, such as standardized tests, that fail to address the complexity of individual teachers' contexts. Federal and state policy makers should value local community characteristics and individual school strengths rather than focusing primarily on standardized measures. A move toward school-level success measures that truly reflect local communities' and stakeholders' interests would yield valuable feedback that is tailored to individual schools. Similar recommendations from Au (2007) and Kawai, Serriere, and Mitra (2014) reinforce the call for developing pedagogical and content area priorities on the local level rather than the state or federal levels, as discussed below. At the federal level, the political will to do so is already moving forward, as evidenced by the recent passing of federal laws concerning education.

In Chapter 1, I discussed the current state of school improvement efforts in light of the No Child Left Behind Act that governed much of the macro-layer contextual influences. Recently, this law was rewritten and passed under the name Every Student Succeeds Act (United States Department of Education, 2015). The new law pivots away from mostly prescriptive requirements, though standardized test-based performance measures persist, and toward more state and localized attention to reform measures. This

change marks a step in the direction of state driven school success measures, including those related to effective use of educational technology resources. In order to further encourage school-level innovation and pedagogical practices that stretch that status quo and allow for educational aspirations beyond test scores, state level policy should similarly deemphasize the standardized and prescriptive measures of school accreditation and allow local school systems to set instructional priorities. However, such efforts at the macro-contextual layer might have little influence on persistent contextual complexities as interpreted by individual teachers.

**Persistent contextual complexities.** Inherent contextual complexities continue to influence and impede the use of inquiry-based learning and educational technology in secondary social studies. Several researchers point to the intersection of contextual realities and the variability of teachers' priorities as persistently challenging circumstances that impede large-scale changes in social studies teaching and learning. Au (2009) argued social studies teaching contexts are "special cases" in relation to standardized testing due to the subjective nature of the discipline and the "lecture-based, textbook style" instruction often found in social studies classrooms (p. 50). Similar arguments from Saye and Brush (2007) and Journell (2009) point to social studies teaching contexts as particularly suited for innovative uses of educational technology despite the tradition of primarily didactic instructional methods. Pace (2011) noted that the relationship between stagnated instructional methods and acceptance of high stakes accountability testing differed in high performing schools as compared to low performing schools. According to Pace, "teachers' agency in curricular-instructional decision-making may be less or more influenced by accountability pressures, and in different ways, as

teachers work in varying school contexts and organizational circumstances” (p. 57). These variations characterize the persistent complexities in social studies teaching contexts’ that make any potential benefits of curriculum and testing standardization a difficult proposition. As reflected in the present study, teacher gatekeeping as influenced by teachers’ educational orientation remains a vital pathway to lasting improvements in social studies pedagogy.

Two studies of similar scope and purpose help frame the present study and the persistent contextual complexities that seem to endure ongoing change on the educational technology landscape. Saye (1998) explored the role of dispositions in teachers’ gatekeeping regarding technology in the classroom. He concluded that teachers’ dispositions are paramount to any potential advantages when considering technology innovation. According to Saye, “teachers accept only changes that support good teaching as each teacher defines it” (p. 233). The second study, published 9 years after Saye’s work, explored the instructional use of computers in four secondary social studies classrooms. DeWitt (2007) primarily focused on socioeconomic status as a context factor and found that teachers’ emphasis on content coverage, and their beliefs about the importance of traditional instruction to achieve that coverage, overshadowed all potential technology related instructional advantages. According to DeWitt, “whatever radical change computer proponents envisioned may be trumped by other contextual factors” such as teacher beliefs and preparation for standardized tests (p. 301). Teachers’ educational orientations define efficacy and shape teachers’ views of successful contexts. Further research on how, if at all, intentional contextual changes could augment teachers’ educational orientations is discussed below.

## **Limitations**

This study took place in a single high school environment as I explored the perceptions of three individual teachers in a particular content area during a finite period of time. Accordingly, the intent was exploratory and illuminative rather than prescriptive and generalizable. As such, results cannot be interpreted as reflective of high school social studies environments in general. However, through rich description of the context and cases, this study can inform inquiries of similar contexts and contribute to the body of literature that addresses context and educational technology uses in secondary social studies. The following sections describe recommendations stemming from this study with the goals of broadening the scope of the research base while honing the approach by which educational technology is studied in context.

## **Recommendations for Future Research**

Nine years after DeWitt's (2007) study, and 18 years after Saye's (1998) work, the present study led to remarkably similar findings. Despite 18 years of technology innovation and resource allocation, I observed teacher decision-making based largely on teachers' educational orientation and curricular efficiency. However, I found educational orientations and curricular factors to be shaped, in part, by school-based influences such as resource allocation and standardized definitions of success. These conclusions inform my recommendations for further research.

This study conceptualized each micro-context of the classroom as an individual information ecology. Future research exploring an entire school, or system, as an information ecology could yield useful findings about the people, practices, and values that shape school-wide approaches to educational technology. Exploring varied state



contexts, such as those that do not have high-stake testing in secondary social studies, is a potential pathway for comparing information ecologies in different macro-contexts.

Research on varied macro and meso contexts would yield illuminative descriptions of different curricular contexts as related to teacher perceptions and educational orientations. Specifically, I recommend an emphasis on exploring the role of administrators and teacher leaders in developing and modeling expectations for technology integration. Secondly, comparative explorations of technology resource-rich and resource-challenged contexts could aid our understanding of how similarly oriented teachers react to varied contextual influences. Comparing and contrasting information ecologies in multiple disciplinary contexts would similarly help target aspects of context that could be changed at the meso and macro levels in order to yield micro level affordances. In each of these recommendations, the continued conception of teachers' contexts as complex interrelated systems will provide a holistic vantage point for exploring teachers' decision-making as simultaneously context-bound and anchored teachers' educational orientations.

Finally, I recommend research targeted on system-wide technology policies and potential influences on individual teachers' instruction. To better understand the effectiveness, or lack thereof, of educational technology resources, researchers and school leaders must not view technology in isolation or as an add-on to existing instructional norms. Rather, we must approach educational technology research as one part of a whole. To understand the part, we must consistently account for the contextual whole. In doing so, researchers can emphasize the potential significance of contextual

influences and inform teachers, leaders, and policy makers on how best to thrive in an increasingly technology-driven world.

## **Conclusions**

For the participants in this study, context does influence their instructional decision-making regarding educational technology, but not as significantly as their educational orientation. Additionally, their instructional decisions both contribute to and are influenced by the characteristics of their contexts. Better understanding the interrelated nature of instructional decision-making and context can refine pedagogical values and practices. As a result, educators can contribute to the formation of healthy and productive information ecologies that fully leverage educational technology. Moreover, recognizing the particular significance of leadership responsibilities on macro and meso-contextual layers can inform educational priorities and leverage the power of context to expand teachers' gatekeeping space.

Malcolm Gladwell's (2000) popular book entitled *The Tipping Point* explored the spread of ideas as social epidemics. He claimed a crucial aspect of ideas taking hold in a society is the context within which those ideas develop. Gladwell referred to this idea as the *power of context*. He argued the key to changing a person's actions or behavior sometimes lies in their surroundings. In his words, "the Power of Context says that human beings are a lot more sensitive to their environment than they may seem" (p. 29). For the teachers in this study, the shared environment of American High School contributed to remarkably different teaching and learning contexts. The teachers were sensitive, though at varied levels, to the power of their individual contexts. In my view, the power of educational contexts is not yet fully determined. The potential to influence

students' learning by way of micro and meso-layer interventions should be pursued as a possible alternative to macro-layer policies. It is my hope that this study and resulting discussion is one step toward a fuller understanding of how the power of educational contexts shape educators, and more importantly, how educators can better shape their contexts.

## Appendix A Consent Form

### WHAT DO I HOPE TO LEARN FROM YOU?

This investigation, entitled “Teachers’ Perceptions of Contextual Influences on Instructional Decision Making Regarding the Use of Educational Technology in Secondary Social Studies” is designed to explore the nature of your teaching context and instructional decision-making in the secondary social studies classroom. Specifically, I want to better understand your decisions related to educational technology use in your daily teaching practice.

### WHY IS YOUR PARTICIPATION IMPORTANT TO ME?

Studying your perceptions regarding contextual influences on instructional decisions related to technology will help me understand the possible effects of varying teaching contexts on teaching practice.

### WHAT WILL I REQUEST FROM YOU?

- I am requesting that you allow me to analyze your responses to multiple interview questions, observe three to five class sessions, and collect relevant teacher-made artifacts. Interviews will last approximately sixty minutes while observations will be a maximum of ninety minutes. Your approximate total time commitment for these activities is six to ten hours, including my observations of your class.
  
- I will ask you to participate individually in three to five audio recorded interviews about your current teaching pedagogy and your perceptions of contextual influences. Initial interviews will be face-to-face, while subsequent interviews may take various forms such as telephone conference or videoconference (such as Skype).
- Once you have completed each interview, I request that you allow me to transcribe, summarize, and analyze its content.
- Once I have submitted a copy of each interview summary and/or observation report for you to correct and clarify if needed, I request that you allow me to ask follow-up questions via telephone or email conversations to help insure your thoughts and comments are understood correctly.

### ADDITIONAL INFORMATION:

Please know that:

- The confidentiality of your personally identifying information will be protected to the maximum extent allowable by law.
- Your name and other identifying information will be known only to the researchers through the information that you provide. Neither your name nor any other personally identifying information will be used in any presentation or published work.

- The audio recordings of the interviews described above will be erased after the study has been completed.
- You may refuse to answer any questions during the interviews if you so choose. You may also terminate your participation in the study at any time. (To do so, simply inform the interviewer of your intention.) Neither of these actions will incur a penalty of any type.
- Your participation in this study is completely voluntary. If you decline to participate, this decision will not endanger your professional standing or future relationship with the College of William & Mary.
- A summary of the results of the study will be sent to you electronically once they are complete.

#### HOW CAN YOU CONTACT ME?

If you have any questions or concerns about this study, please contact the researcher, Mr. Adam Barger (apbarger@email.wm.edu) at The College of William & Mary, Williamsburg, Virginia or his supervising professor, Dr. Mark Hofer (mjhofe@wm.edu). If you have additional 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, Dr. Tom Ward at 757-221-2358 (EDIRC-L@wm.edu) or Dr. Ray McCoy (rwmcco@wm.edu), chairs of the two William & Mary committees that supervise the treatment of study participants.

By checking the “I agree to participate” response below, then signing and dating this form, you will indicate your voluntary agreement to participate in this study, and confirm that you are at least 18 years of age.

\_\_\_\_\_ I agree to participate.

\_\_\_\_\_ I don't agree to participate.

A copy of this consent form will be given to you to keep.

#### SIGNATURES:

Participant: Date:

Interviewer: Date:

#### PERSONNEL QUALIFICATIONS

I, Adam Barger, will be conducting all primary research and analysis involved in the proposed study. I am licensed teacher in History and Social Sciences with 11 years of classroom experience. My personal qualifications as a PhD candidate at the College of

William & Mary include my completion of all necessary doctoral-level coursework, including courses on qualitative research, and the completion of the CITI training modules. Additionally, Dr. Mark Hofer is acting as a co-PI on this study.

Dr. Mark Hofer is the Gertrude Smoot Spears Term Distinguished Associate Professor of Educational Technology and Associate Dean for Teacher Education and Professional Services at the College of William & Mary. Dr. Hofer has extensive experience as a qualitative researcher and supervisor of doctoral candidates, including 10 years of service at The College of William & Mary.

### **Personnel Qualification**

I, Adam Barger, will be conducting all primary research and analysis involved in the proposed study. My personal qualifications as a PhD candidate at the College of William & Mary include my completion of all necessary doctoral-level coursework, including courses on qualitative research, and the completion of the CITI training modules. Additionally, Dr. Mark Hofer is acting as a co-PI on this study.

Dr. Mark Hofer is the Gertrude Smoot Spears Term Distinguished Associate Professor of Educational Technology and Associate Dean for Teacher Education and Professional Services at the College of William & Mary. Dr. Hofer has extensive experience as a qualitative researcher and supervisor of doctoral candidates.

Appendix B  
**Primary Participant Semi-structured Interview Guide**

**General Discussion:**

- Teaching background and experience
- Overall sense of educational technology in your instruction.

**Topic 1: Organizational factors**

- What are the prevalent views of educational technology in your institution (school or district)?
- What are some examples of educational technology resources present in your building?
- Do you perceive an instructional culture and/or instructional expectations in your schools? If so, how would you describe it?
- How, if at all, do these organizational factors intersect with your day-to-day instruction?

**Topic 2: Interpersonal factors**

- What is your view on collegiality in your institution? How, if at all, is collegiality developed?
- How do you perceive administrative support for your teaching efforts?
- How do you describe the teacher/student interaction and rapport in your classroom?
- How, if at all, do these interpersonal factors intersect with your instruction?

**Topic 3: Curricular factors**

- What is your view of curriculum standards in your content area?
- How, if at all, do you perceive the preferred content-area approach (preferred pedagogy)?
- How, if at all, do these curricular factors intersect with your instruction?

#### **Topic 4: Gatekeeping decisions**

- Gatekeeping refers to the day-to-day enactment of the curriculum in your classroom and the ongoing decisions you make to shape your instructional approach. How do you describe your freedom or agency to make these decisions?
- What factors, discussed earlier, most influence your agency, or decision-making power, on a day-to-day basis?
- How, if at all, would you rank your gatekeeping priorities?

Note: Follow up interviews will follow a unique interview guide that is developed after initial interviews and observations. Though general topics will be similar, the discussion points and questions will be specifically tailored to the participant.



## Appendix C

### Staff Semi-structured Interview Guide

#### General Discussion:

- Background and experience leading to this position:
- Overall sense of educational technology in instruction at this institution:

#### Topic 1: Organizational factors

- What are the prevalent views of educational technology in your institution (school or district)?
- What are some examples of educational technology resources present in your building? What resources are most prevalent or heavily used?
- Do you perceive an instructional culture and/or instructional expectations in your schools? If so, how would you describe it?
- How do you describe your role in shaping the instructional culture, including technology use, at this institution?
- How, if at all, do these organizational factors intersect with your day-to-day leadership responsibilities?

#### Topic 2: Interpersonal factors

- What is your view on collegiality in your institution? How, if at all, is collegiality developed?
- How do you perceive the role of administrative support of technology use at this institution?

-How, if at all, does your working relationship with teachers intersect with your leadership role?

**Topic 3: Curricular factors**

-What is your view of curriculum standards in this institution?

-How, if at all, do curriculum standards and/or expectations support teachers' use of technology in the classroom?

**Topic 4: Gatekeeping decisions**

-Gatekeeping refers to the day-to-day enactment of the curriculum in the classroom and the ongoing decisions teachers make to shape their instructional approach. How do you describe their freedom or agency to make these decisions?

-How, if at all, do your responsibilities intersect with teachers' gatekeeping decisions?

Note: Staff interviews are designed to illuminate a broader scope of the instructional context. Interviewees will participate in one interview and follow up communications as necessary.

## Appendix D

### Observation Protocol

|  |  |  |
|--|--|--|
| <b>Participant:</b><br>Date/time:<br>Block:<br># of students: _____<br>Lesson topic:<br><b>SS edtech categories:</b><br><input type="checkbox"/> organization/ scaffolding<br><input type="checkbox"/> interaction/ collaboration<br><input type="checkbox"/> new knowledge creation | <b>Technology uses:</b><br><input type="checkbox"/> multimedia projector<br><input type="checkbox"/> interactive white board<br><input type="checkbox"/> teacher comp.<br><input type="checkbox"/> student comp.<br><input type="checkbox"/> tablets (iPads)<br><input type="checkbox"/> computer lab<br><input type="checkbox"/> Internet sites<br><input type="checkbox"/> web-based applications<br><input type="checkbox"/> other: | <b>Instructional strategies:</b><br><input type="checkbox"/> extended lecture<br><input type="checkbox"/> mini-lecture<br><input type="checkbox"/> student collaboration<br><input type="checkbox"/> ongoing project<br><input type="checkbox"/> individual work<br><input type="checkbox"/> writing exercise<br><input type="checkbox"/> in-class assessment<br><input type="checkbox"/> audio/visual uses<br><input type="checkbox"/> other: |
|--|--|--|

Observer notes regarding technology use:

Running record of class structure/activities  
(5-10 minute increments)

## Appendix E

### Sample Member Check

Initial email:

Hi [Martha],

I look forward to visiting your classes tomorrow. Thanks for having me in.

Attached is the interview summary from our first interview. Please have a look at it when you can. Remember that these summaries are just main ideas, summarized and condensed. If you feel anything should be added, deleted, or explained more, please just let me know.

Best,

Adam

Response:

Looks great!

[Martha]

### Martha Interview 1 Summary

#### General Discussion:

-Teaching background and experience

- 12<sup>th</sup> year teaching, 1<sup>st</sup> year at WJCC
- Served in prior system for 11 years after earning Bachelor's degree in History

-Overall sense of educational technology in your instruction.

- Our students are going to be 21<sup>st</sup> century workers so they have to be 21<sup>st</sup> century learners.
- Student need a strong background in technology, but in general, students here are not prepared well, especially for online learning. This school has limited laptops, devices, and network access for students.
- My previous district was very technology driven, while WJCC is still old-fashioned whiteboard and dry erase marker

-On instructional changes from last position to current position:

- It was hard coming here, I came with a flash drive and everything ready for technology. I had a class webpage and an online learning app at my last district. This division doesn't have any of that, so I spent a lot of the pre-teacher days just trying to wrap my head around having to make everything hard copy. So it's been a challenge because I have to rework whatever fit in the technology world fit on paper in front of them.

### **Topic 1: Organizational factors**

-What are the prevalent views of educational technology in your institution (school or district)?

- It's hard to get a read on what the division does because they seem very disconnected from the school. Many see the value of technology and they are trying to take it there, but there is a lot of the old guard of the division that like the old way of doing things.
- Here, some teachers are afraid of technology. They are entrenched. They see people coming from outside the division and they don't want to change their style. (examples: interactive achievement, uploading lesson plans, collaborating)

-What are some examples of educational technology resources present in your building?

- old HP computers, kids don't like to use them, one to one has been talked about
- we have a student network for BYOD, but few use it because it never works.
- Old-fashioned projector attached the ceiling is what is used most (for presentations)

-Do you perceive an instructional culture and/or instructional expectations in your schools? If so, how would you describe it?

- Our department is very "intense", they work in isolation, they are very competitive (little to no sharing). Technology is a point of contention.
- AP teachers tend to ostracize everyone else because AP I seen as the elite, while everything else is just something they have to do by the state.
- Concerning technology, their (veteran teachers) view is ignore the implementation talk and it will go away.

-How, if at all, do these organizational factors intersect with your day-to-day instruction?

- If I was a new teacher, I would be sunk. There is no common assessment, no gauge as to how we are doing, just the SOL. I am very much on my own.
- I do things differently and I get watched closely (by fellow teachers)

### **Topic 2: Interpersonal factors**

-What is your view on collegiality in your institution? How, if at all, is collegiality developed?

- It is not developed here, only among certain groups. Many view it as a community college, they come in and do their thing, then disperse at 2:20

-How do you perceive administrative support for your teaching efforts?

- They are nice, but not involved.

-How do you describe the teacher/student interaction and rapport in your classroom?

- I don't have any problems with my kids. I hear of other teachers that do have issues. There is a disconnect with the affluent population. Parents are demanding.

-How, if at all, do these interpersonal factors intersect with your instruction?

- I don't have any issues with that. I have heard stories about other situations where a parent complains to the superintendent, but I have not experienced that.
- My philosophy on education is to make it as interactive and fun as possible so students enjoy learning. I do that, and they enjoy coming to my class. Some teachers assign a mountain of work so students don't have time to do anything else.

### **Topic 3: Curricular factors**

-What is your view of curriculum standards in your content area?

- WJCC has no city curriculum. I wrote the Social studies curriculum for my last district and I am familiar with what the high school curriculum should look like. Here, they just have what the state gives. Every teacher is on their own.

-How, if at all, do you perceive the preferred content-area approach (preferred pedagogy)?

- Everyone does their own thing. There is a social studies coordinator, but no one listens to her. There is vision to get everyone on the same page, but Theresa has hit so many walls that she has sort-of given up.

-How, if at all, do these curricular factors intersect with your instruction?

- I ignore all of it. I am not a new teacher, so I use my own pacing guide and curriculum and teach it in isolation. But, I teach it the way I know to teach it best. I don't worry about what my colleagues are doing.
- I find little ways to use technology and work around the limitations (upload notes, use Edmodo, etc.)

### **Topic 4: Gatekeeping decisions**

-Gatekeeping refers to the day-to-day enactment of the curriculum in your classroom and the ongoing decisions you make to shape your instructional approach. How do you describe your freedom or agency to make these decisions?

- There is no oversight in this building at all. They don't care what I do. They care about an SOL pass rate over 90%.
- There is emphasis on gap groups but there is no forward movement.

-What factors, discussed earlier, most influence your agency, or decision-making power, on a day-to-day basis?

- They don't. I could do whatever I want in the classroom, and no one will care. I find that odd coming from a system where there is a lot of oversight.

-How, if at all, would you rank your gatekeeping priorities?

- Staying on track, covering material while going above and beyond.

Note: Follow up interviews will follow a unique interview guide that is developed after initial interviews and observations. Though general topics will be similar, the discussion points and questions will be specifically tailored to the participant.

## Appendix F

### Available Technology Resources at American High School

#### Technology Use and Information for █████ Public Schools

| Technical Assistance<br>████████████████████ High School ██████████   |   |   | Instructional Assistance  |   |                     |
|---|---|---|---|---|---------------------|
| Call the Help Desk: ext. ██████████ (IT)  |   |   | ████████████████████ (ITRT)   |   |                     |
| IT - For technical problems with equipment or for software installations, submit an IT Help Desk ticket or call the IT Help desk at ██████████  |   |   | ITRT - Assists staff with technology integration, conducts technology staff development and provides training on equipment, programs and systems. |   |                     |
| Network Username:   |   |   | Network Password:   |   |                     |
| Teachers and Staff members have a variety of accounts and passwords. This sheet is designed to help you keep track of all of your account information. <i>Please keep your passwords private.</i> It is an AUP violation to share them. The most secure passwords are at least eight characters long and contain a combination of upper and lower case letters, numbers, and symbols. |   |   |   |   |                     |
| Tool  | Purpose   | Where to Access   | Questions Contact   | Username  | Password            |
| ██████████  | Attendance, grading, parent communication, and curriculum                               | ████████████████████  | ITRT  | Network Username                                | Network Password    |
| ████████ Connect  | Collaborative work and communication SharePoint intranet site for the division          | Use Connect to access most resources<br>████████████████████                                | ITRT  | From Home –<br>████████████████████<br>username | Network Password    |
| Employee Online   | Access to paystubs, withholding, leave, and tax information                             | ████████████████████  | Human Resources / Finance   | Employee ID number<br>████████████████████      | Password you create |
| HELP DESK   | Where to submit<br>████████████████████<br>████████████████████<br>████████████████████ | ████████████████████<br>████████████████████<br>████████████████████                        | ████████████████████  |   |                     |
| Spam Manager  | View blocked email and manage which email addresses to allow or block                   | ████████████████████<br>████████████████████  | ITRT  | Network Username                                | Network Password    |
| AESOP   | Schedule substitute teachers  | <a href="https://www.aesoponline.com/login2.asp">https://www.aesoponline.com/login2.asp</a> | Human Resources   | Primary phone number                            | Provided by AESOP   |
| Electronic Registrar  | Register for and track professional development   | ████████████████████<br>████████████████████  | ████████████████████  | Employee ID number (5 digits)                   | Pin you create      |
| Talent-Ed   | Smart Goal submission and performance evaluation system                                 | ████████████████████<br>████████████████████  | Human Resources   | Network Username                                | Network Password    |
| Video Library   | Television stations and other media   | ████████████████████<br>Library Log In  | ITRT<br>Media Specialists   | Auto-login                                      |                     |



# Technology Use and Information for [REDACTED] Public Schools

[REDACTED] High School 2015-2016

| Web Tools   | Purpose  | Where to Access   | Questions Contact         |
|---|--|---|---------------------------|
| [REDACTED] SharePoint                                 | Collaborative work and communication site for staff. Includes school staff calendar, shared resource sign up calendars, and important staff documents. | [REDACTED]  | ITRT                      |
| TurnItIn.com  | Student work submission tool that checks for plagiarism, allows for peer editing, discussions, and paper grading tools.                                | www.turnitin.com  | ITRT                      |
| EasyBib   | Student research tool  | <a href="http://www.easybib.com">http://www.easybib.com</a>                 | Media Specialists         |
| [REDACTED]  | Video and resource streaming tool  | [REDACTED]  | ITRT                      |
| World Book Online                                     | Offers encyclopedia, dictionary, atlas, study aids, and curriculum guides.   | www.worldbookonline.com<br>[REDACTED]                                       | Media Specialists<br>ITRT |
| Culturegrams  | Web resource to foster understanding and appreciation of the world's countries and peoples.  | [REDACTED]  | Media Specialists<br>ITRT |
| [REDACTED]  | Over 2,000 full-text sources including magazines, newspapers, books, television & radio transcripts, maps, pictures, and audio & video clips.          | [REDACTED]  | Media Specialists<br>ITRT |
| [REDACTED] Curriculum                                 | Digital lessons and resources  | [REDACTED]  | ITRT                      |
| Compass Learning                                      | Web based credit recovery and in-course remediation tool   | [REDACTED]  | ITRT                      |
| Desire2Learn  | [REDACTED]   | [REDACTED]  | ITRT                      |
| Learning Gizmos                                       | Experience science and math with over 350 online interactive simulations for grades 3-12   | <a href="http://www.explorelearning.com">http://www.explorelearning.com</a> | ITRT                      |
| Instructional Technology Standard (ITS)               |  | Software Available on most computers  |                           |
| Ceiling Mounted Projector                             |  | Microsoft Office 2013 (Will need to update software)                        |                           |
| Ceiling Mounted Speakers                              |  | Doceri  |                           |
| Teacher input panel                                   |  | Audacity  |                           |
| Teacher control panel                                 |  | MovieMaker  |                           |
| Document Camera                                       |  | iTunes  |                           |
| Wireless keyboard                                     |  | IrFan View  |                           |
| Teacher microphone                                    |  | Read, Write, Gold   |                           |
|   |  | Skype   |                           |
|   |  | Inspiration   |                           |
|   |  | PhotoStory3   |                           |
| Shared Resources available for checkout at [REDACTED] |  |   |                           |
| 8   | student laptop carts   |   |                           |
| 6   | Qwizdom personal response (clickers) sets  |   |                           |
| 15  | Flip Video Cameras   |   |                           |
| 6   | Digital Cameras  |   |                           |
| 2   | Web Cameras  |   |                           |
| 4   | computer labs  |   |                           |
| 30  | iPods (11 with cameras)  |   |                           |
| 4   | digital video recorders  |   |                           |
| 2   | Video Cameras  |   |                           |
| 1   | Bluescreen   |   |                           |

## Appendix G

### A priori and emergent code list

#### **Meso-level factors**

- technology resistance
- internet connectivity
- limited access to technology
- tech training
- bandwidth/ capacity

#### **Macro-level factor**

- unavoidable time constraints

#### **Micro-level factors**

- challenging diversity of students
- student perspective on tech

#### **Interpersonal context factors**

- Lack of cooperation/synergy
- admin support low
- admin support high
- parent expectation high
- collegiality/ synergy
- student rapport
- relationship-enforced status quo
- admin expectations for edtech use

#### **Organizational factors**

- school level leadership
- efforts to build collegiality

#### **Curricular factors**

- state curriculum use
- SOL as ultimate priority

#### **Gatekeeping**

- high agency

#### **Contested space**

#### **Edtech: presuppositions**

- positive edtech presuppositions

#### **Teacher disposition**

- background/ value for education
- desire for collaboration
- philosophy of ed

#### **Edtech: constraints**

**SS edtech use**

- organization/ scaffolding
- interaction/ collaboration
- new knowledge creation
- standard or didactic tech use

**Edtech affordances**

- teacher use edtech
- student use edtech

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