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Exploring Catholic Education In The Twenty-First Century: Teaching Practices, Technology Integration, And Educational Goals

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EXPLORING CATHOLIC EDUCATION IN THE TWENTY-FIRST CENTURY:
TEACHING PRACTICES, TECHNOLOGY INTEGRATION, AND EDUCATIONAL
GOALS

A Dissertation Presented

by

Meredith J.C. Swallow

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ABSTRACT

Although Catholic schools are the largest sector of the national private and faith-based educational market, the overall student enrollment in Catholic K-12 schools has steadily declined. In order for Catholic schools to remain sustainable and competitive among the many different educational options in the twenty-first century, they must set themselves apart from other schools by offering unique learning opportunities that support twenty-first century education while promoting Catholic educational values. Recognizing the need for updated teaching practices, balanced pedagogy with Catholic educational values, and focused research on Catholic education, this two-year multiple-case study explored the instructional practices of eight middle level Catholic teachers during an initiative focused on shifting instructional strategies to support twenty-first century education supported by educational technology integration. Teaching practices were documented through participant observations, interviews, survey, and historical and field evidence.

Data illuminated much variability in teachers' interpretations of twenty-first century education, classroom practice, and levels of technology integration. All teachers encouraged creativity, critical thinking, communication and collaboration in their instruction, however these specific domains of learning were primarily supported through an emphasis on lower order cognitive skills and processes. Although evidence suggested consistent technology integration in classrooms, technology was primarily used to substitute or augment instruction as opposed to the transformation of teaching and learning to support twenty-first century education. Data also revealed a balance between Catholic educational values and new teaching pedagogies except in Religion classes or instruction. This finding suggested content subject culture was a confounding aspect to instructional practices. This study highlights suggestions for teacher practice that include rethinking the purpose and structure of assessment, balancing personal opinions of technology with twenty-first century instruction, and shifting teacher-student classroom roles to foster teaching and learning environments that support creativity. Furthermore, additional implications for teachers and policy makers center on collaboration as a model for student learning, and to promote a shared vision for Catholic education in the twenty-first century. The implications for future research focus on expanding the study to include school level influencing factors and participants, centering on Religion class as the context, and the inclusion of students' perspectives.

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CHAPTER ONE

Introduction

In the twenty-first century, the Catholic religion is the largest Christian domination in the United States, and Catholic schools are the largest sector of the private and faith-based educational market (Hunt & Carper, 2012). Approximately 5.5 million K-12 students are enrolled in private school and, of that, 2.2 million are enrolled in Catholic schools (“Catholic School Data,” 2013, “K-12 Facts,” 2014), making up approximately four percent of the total (public and private) K-12 enrollment. Many families seek out an alternative to private secular education (Hunt & Carper, 2012), and Catholic schools offer a demonstrated commitment to character and community involvement, faith, and academic success (Kennedy, 2013; Nuzzi, Frabutt, & Holter, 2012). Over the last two decades however, K-12 Catholic school enrollment has steadily declined (Nuzzi, Frabutt, & Holter, 2014). Demographic shifts, a more secularized society, the rise of charter schools, and financial burdens have contributed to this decline (Kennedy, 2013; Nuzzi et al., 2014). Therefore, Catholic schools are not only in a position of survival; in order to remain competitive among the many different schooling options, they must set themselves apart from other schools by offering unique learning opportunities in conjunction with Catholic educational values. However, despite the successes demonstrated throughout the history of Catholic school education and the acknowledgement of declining enrollment, there are few advocates at the national, or state, educational policy levels interested in preserving the structures of K-12 Catholic

education, and building a comprehensive vision for the sustainability of Catholic schools (Nuzzi et al., 2012). To help achieve comprehensive goals and priorities for Catholic education in the twenty-first century, increased focused research on the educational opportunities within Catholic schools becomes a priority. Understanding local strategic plans to endorse Catholic education provides a platform for moving the conversation to the state level. Therefore, the purpose of my study was to explore teaching practices of Catholic middle level educators in support of twenty-first century education. As such, I also considered the broader goals of twenty-first century education, shifting teaching practices to support twenty-first century outcomes, technology integration as a model to enhance twenty-first century teaching and learning, and how these aspects contribute to Catholic education in the twenty-first century.

The dynamic landscape of the twenty-first century necessitates rethinking the structures and purposes of education. Economic development and social change requires participation in jobs within a world that is flexible and unpredictable (Dede, 2010; Schleicher, n.d.), and educators are tasked with the unprecedented demands of preparing students for challenges that have yet to exist. Teachers' purpose and roles are shifting; traditional models of content delivery and mastery are not sufficient for the new emphasis on challenge-based, active, collaborative, and student-driven learning environments (Fullan & Langworthy, 2014; Johnson, Adams Becker, Estrada, & Freeman, 2014). With technology as a driving force in societal change, school and classroom-based technology initiatives or integration plans are becoming normal practice (Daniels, Jacobsen, Varnhagen, & Friesen, 2014; Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010), with

teacher and student access to portable devices doubling over the past two years (Speak Up, 2013).

Technology provides information access, abilities to communicate, and opportunities to collaborate on a universal scale unparalleled to prior decades. Such levels of emergent change create transformed possibilities for work and participation in the global environment. In order for students to become active and effective contributors in a knowledge-based, connected world, preparation for this dynamic landscape requires a fundamental change in educational pedagogies (Fullan & Langworthy, 2014). The commonly cited goal of supporting and enhancing twenty-first century skill development (Argueta, Huff, Tingen, & Corn, 2011; Johnson et al., 2014; Muir, 2007) is often combined with the necessary changes in teaching practices to encourage such contemporary learning skills and outcomes (Sauers & McLeod, 2012; Shapley, Sheehan, Maloney, & Caranikas-Walker, 2009). However, there is little evidence of actual shifts in teaching practices that do support twenty-first century skill development (Cuban, 2006; Daniels et al., 2014; Galla, 2010; Gibbs, Dosen, & Guerrero, 2008; Gunn & Hollingsworth, 2013; Weston & Bain, 2010). Ertmer and Ottenbreit-Leftwich (2010) suggested that the qualities that enable teachers to leverage technology as a meaningful tool include knowledge, self-efficacy, pedagogical beliefs, subject and school culture. The relationships among those characteristics are often explored through various twenty-first century teaching and learning frameworks, with the technological, pedagogical, and content knowledge (TPACK) framework dominating the literature (Koehler, Mishra, Kereluik, Shin, & Graham, 2014). However, the distinctions and intricacies between

different teaching contexts and school environments is changing continuously, and focused research on context is an ongoing need (Angeli & Valanides, 2009; Ertmer & Ottenbreit-Leftwich, 2010; Koehler et al., 2014). In the twenty-first century, the Catholic school context provides a unique opportunity to understand technology integration and teaching practices as Catholic schools are not only faced with twenty-first century teaching and learning demands, but also are challenged by enrollment decline and school closures (Kennedy, 2013; Nuzzi et al., 2012).

Miller's (2006) overview on the teaching in Catholic schools highlighted the challenges of maintaining the sustainability of Catholic schools and education. Before the turn of the Century, Zukowski (1997) suggested a complete paradigm shift in Catholic education, rethinking school as an institution of learning rather than an institution of instruction. However, although Antczak (1998) recognized that in the twenty-first century Catholic education and curriculum would change, she raised questions about the overall impact on the purpose of Catholic school, and specifically focused on the overriding religious purpose - to teach the Gospel. While Catholic educational leaders and policy makers advocate for innovative teaching practices to remain competitive and relevant in the public and private educational landscape (Kennedy, 2013; O'Keefe & Goldschmidt, 2014; Zukowski, 2012), maintaining and strengthening the Catholic identity and faith also emerges as a contemporary challenge (Nuzzi et al., 2012). At the most recent meeting of the Research on Catholic Education Special Interest Group at the American Educational Research Association, Catholic leaders and researchers called for increased attention and new research directions to

include the intersection of Catholic schools' religious values with instruction (Nuzzi et al., 2014). Despite these conversations, minimal research has been conducted on the complexities of Catholic education in the twenty-first century (Tellez, 2013).

Research Questions

Using multiple-case study as a research design, my purpose of this research was to explore teaching practices of Catholic middle level educators in support of twenty-first century education. As such, I addressed the following research questions in three articles:

Article One: Teaching Practices to Support Twenty-First Century Education in Catholic Middle Level Classrooms

1. How do middle level Catholic school teachers interpret and apply twenty-first century teaching practices?
2. How do contextual factors influence teachers' instructional practices as they align to twenty-first century educational goals?

Article Two: The Influence of Technology Integration on Middle Level Catholic Teachers' Instructional Practices

3. How are Catholic educators integrating technology in their teaching?
4. How does the use of technology influence teachers' instructional practices?

Article Three: Exploring the Balance Between Catholic Schools' Educational Goals, Teaching Practices, and Technology Integration

5. How do middle level Catholic educators perceive their teaching practices align to Catholic educational goals?

6. How does technology support middle level Catholic educators' instructional goals and practices as they relate Catholic educational goals?
7. How does technology challenge middle level Catholic educators' instructional goals and practices as they relate Catholic educational goals?

Significance

The purpose of my research was to explore the teaching practices of Catholic middle level educators in support of twenty-first century education. I further aimed to explore and understand the balance between necessary shifts in instruction that do support twenty-first century teaching and learning with Catholic educational values and goals. In addition to addressing the significant gap in research on teaching practices and technology integration in Catholic schools, this study directly responds to the call from Catholic leaders, researchers, and educators for specific research within the Catholic school context that focuses on the intersection of Catholic schools' religious values with instruction. Furthermore, exploring local schools' strategic plans to endorse Catholic education in the twenty-first century helps to focus attention on the need for comprehensive goals and priorities for Catholic schools to remain relevant and sustainable in the twenty-first century.

In addition to context, I am able to contribute new perspectives on twenty-first century teaching and technology integration in middle level classrooms. I reviewed relevant research in the area of educational technology and found minimal studies that, within the same inquiry, collected data on teaching practices prior to, and after, technology integration. My use of multiple-case study over two years yielded the

opportunity to interview, survey, and observe teachers before and after the implementation of new digital technologies. Therefore, I was first able to explore twenty-first century teaching practices irrespective of technology integration thus focusing on pedagogy as opposed to only technology.

Definitions of Terms

Educational Technology

Educational technology can be broadly defined as “the considered implementation of appropriate tools, techniques, or processes that facilitate the application of senses, memory, and cognition to enhance teaching practices and improve learning outcomes.” (Aziz, 2010). For this particular study, I considered specific forms of educational technology initiatives as defined below.

One-to-One (1:1). The basic position of 1:1 technology provides teachers and students with a portable, Internet capable device, for continuous use at school and home (Penuel, 2006).

Shared Cart. A shared cart refers to a set of portable, Internet capable devices that is shared among all middle school students. Teachers reserve the cart for their specific class, and each student in that class has continuous access to the same device for the time reserved by the teacher.

Middle School or Middle Level

Grade levels that separate elementary from secondary education, typically with students of ages 10 – 15 years. For this study, middle school grade levels were based on the organization of the participants’ schools.

Twenty-First Century Education

Teaching and learning that focuses on twenty-first century outcomes that are believed by educators, school leaders, researchers, employers, and others to be critically important for success in today's world.

CHAPTER TWO

Literature Review

Introduction

At the meeting of the Research on Catholic Education Special Interest Group at the American Educational Research Association, Catholic leaders and researchers suggested a need for focused studies on present-day Catholic education (Nuzzi et al., 2014). They demonstrated saturation in the field of historical Catholic research, and highlighted a demand for studies that addressed contemporary instructional practices, and how such classroom practices could help to reshape Catholic education. In order to fully understand the current state of Catholic schools, I first reviewed books and research focused on the history of Catholic schooling over the past two centuries. I similarly found extensive literature on Catholic educational history (e.g. Buetow, 1988; Hunt, 2012; Nuzzi et al., 2012), and limited studies that focused on twenty-first century education. For the purpose of this research, four bodies of recent related literature informed my study; twenty-first century education, technology in education, foundations of a Catholic school, and Catholic education in the twenty-first century. I explored these specific areas to gain a broader understanding of the relationships between different facets of education and how they all relate to understanding Catholic education in the twenty-first century (Figure 2.1).

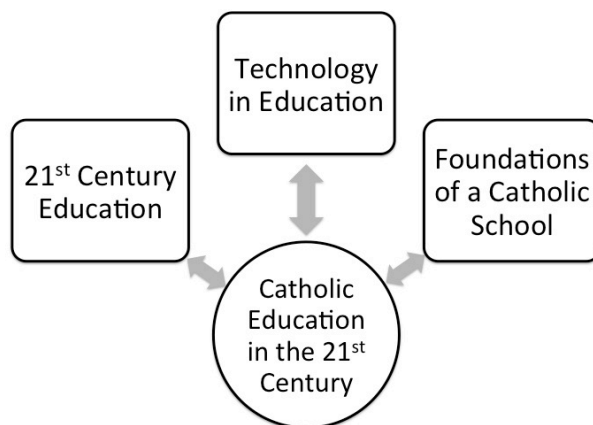


Figure 2.1. Reviewed literature

Twenty-First Century Education

Information transfer through direct instruction is a teaching method that dominated education for centuries. The design of twentieth century teaching emphasized time based memorization and retelling of facts. Students were passive learners of content knowledge, and demonstrated understanding through routine summative assessment. This construct of teaching and learning supported twentieth century educational goals through student preparation in the use of routine skills (Pacific Policy Research Center, 2012) for jobs that consisted of procedural cognitive work and labor (Dede, 2010). Dede (2010) suggested the twenty-first century “has seen a dramatic shift in the economic model for industrialized countries” (p. 2), and the successful worker, therefore, needs skills that support creativity, flexibility, and fluency in information and communication technologies. Schleicher (n.d.) called attention to a fast-changing world where educational success depends on knowledge application to modern situations. Therefore, the primary challenge for education is “to align curriculum and learning to new economic

and governance models based both on a global, knowledge-based workplace” (Dede, 2010, p. 4), in order to prepare students for future work and life that emphasizes information and knowledge construction opposed to standardized systems and manufacturing. Fullan and Langworthy (2014) compared “old and new pedagogies” and highlighted old pedagogies that focused on technology use, pedagogical capacity, and content knowledge to achieve the primary goal of content mastery (p. 3). In contrast, new pedagogies modeled teacher student partnerships in the learning process. New pedagogies are “used to discover and master content knowledge and to enable the deep learning goals of creating and using new knowledge in the world” (p. 3).

The twentieth century models of passive learning through information consumption from a teacher centered approach are dated as digital technologies increasingly allow instant access to information (Gunn & Hollingsworth, 2013). Some studies of technology integration highlighted the necessary shift in teaching and learning strategies toward dynamic learning environments (Sauers & McLeod, 2013; Shapley et al., 2009). However, many technology rich environments do not develop pedagogy suitable toward dynamic learning (Daniels et al., 2014; Galla, 2010; Gibbs et al., 2008). Often technology is utilized as a modern learning tool but content delivery remains in a twentieth century model (Cuban, 2006; Gunn & Hollingsworth, 2013; Weston & Bain, 2010). Research on technology in education indicated undeniable use in classrooms, but yielded diverse perspectives on actual effectiveness in consideration of the deeper teaching and learning goals and outcomes of twenty-first century education (Gunn & Hollingsworth, 2013). With new standards replacing basic skill competencies (Pacific

Policy Research Center, 2012), schools are tasked with shifting curriculum and teaching to support the broad idea of twenty-first century learning and future work preparation (Dede, 2010). It follows then that a shift toward twenty-first century teaching and learning environments requires a deeper understanding of those environments, and the associated teaching and learning goals.

Twenty-First Century Educational Frameworks

Bloom's Revised Taxonomy. The widespread familiarity with Bloom's taxonomy (Lightle, 2011) provided a foundation for understanding contemporary educational objectives. Bloom's original cognitive knowledge domain was broken down into six levels, each dependent on the one below (Figure 2.2) (Bloom, 1956; Munzenmaier & Rubin, 2013). Based on new understandings of teaching and learning in the twenty-first century, Anderson and Krathwohl (2001) updated the original taxonomy and focused on the dimensions of knowledge levels and cognitive processes. The knowledge dimension classified four types of knowledge that may be required in student learning: factual, conceptual, procedural, and metacognitive. The cognitive processes focused on a continuum of thinking skills: remembering, understanding, applying, analyzing, evaluating, and creating (see Figure 2.2). Within the cognitive processes, one of the primary differences between the original and revised taxonomies was the change in hierarchical named levels from nouns to verbs (Anderson & Krathwohl, 2001).

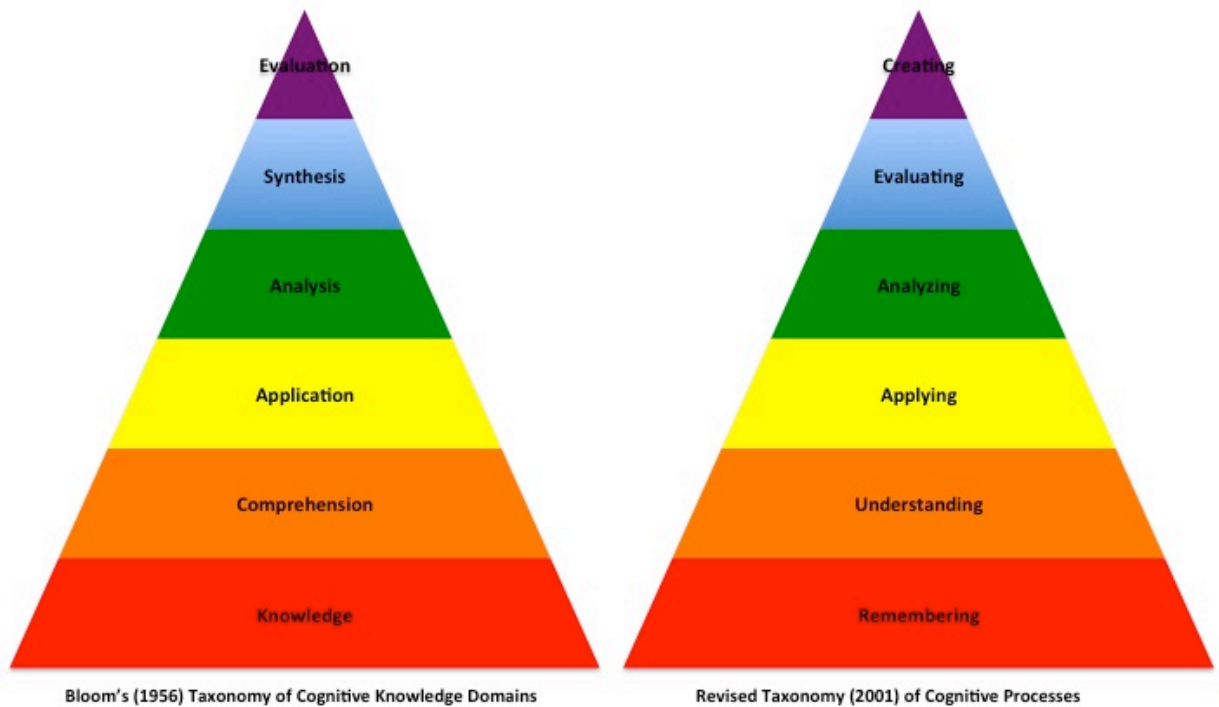


Figure 2.2. Bloom's (1956) Original Taxonomy of Cognitive Knowledge Domains, and Anderson and Krathwhol's (2001) Revised Taxonomy of Cognitive Processes.

I chose to use the Bloom's revised taxonomy as a framework whereas it is inclusive of what might be considered traditional teaching as well as twenty-first century practices. The adaption has the potential to change classroom objectives to describe thinking *processes* opposed to behaviors (Munzenmaier & Rubin, 2013). Furthermore, since the modification of Bloom's taxonomy, and the extensive adoption of technology in education, new modifications to the revised taxonomy have included ways to use digital tools at each revised cognitive level (Churches, 2009). However, in the context of this

research the focus is on the 2001 updated cognitive processes; the premise is that to fully understand how to foster educational environments of flexibility and creativity in student learning, it is necessary to understand the associated teaching modifications regardless of new technologies. Although the revised taxonomy provides a contemporary approach to understanding cognitive development, shifting teaching practices toward inquiry-oriented environments remains a challenge (Cuban, 2006; Dede, 2010; Houghton, n.d.). In order to understand teaching practices that support twenty-first century learners, one must first understand learning goals and outcomes for the twenty-first century.

P21: Twenty-first Century Skills. The shift from twentieth to twenty-first century educational thinking prompted educational leaders and researchers to challenge the success of a teaching model that emphasized teacher-centered learning through scripted curriculum (Becker & Ravitz, 1999). Many organizations have promoted twenty-first century standards or competencies tied to teaching practices, learning outcomes, and/or technology integration (Voogt & Roblin, 2010). Founded in 2002, the Partnership for 21st Century Skills (P21) brought together educational leaders, policymakers, and the business community to “kick-start a national conversation on the importance of twenty-first century skills for all students” (Partnership for 21st Century Skills, 2014). With the intent of student preparedness in higher education, careers, and a globally competitive workforce, the developed P21 Framework integrated core subjects with twenty-first century skills focused on the identification of twenty-first century skills, implementation issues, and considerations for assessment (Partnership for 21st Century Skills, 2014; Voogt & Roblin, 2010). P21 asserts that mastery of core subjects (English,

reading, or language arts, world languages, arts, mathematics, economics, science, geography, history, government, and civics) is essential to student success (Partnership for 21st Century Skills, 2014). Table 2.1 outlines the P21 Framework as a suggested integrated model from the P21 organization of the skills, knowledge, and expertise students need to succeed in work and life (Partnership for 21st Century Skills, 2014).

Table 2.1
Partnership for 21st Century Skills Framework

21st Century Themes	Learning and Innovation Skills	Information, Media and Technology Skills	Life and Career Skills	21st Century Support Systems
Global Awareness	Creativity and Innovation	Information Literacy	Flexibility and Adaptability	Standards and Assessments
Financial, Economic, Business and Entrepreneurial Literacy	Critical Thinking and Problem Solving	Media Literacy	Initiative and Self-Direction	Curriculum and Instruction
Civic Literacy	Communication	Information, Communications and Technology Literacy	Social and Cross-Cultural Skills	Professional Development
Health Literacy	Collaboration		Productivity and Accountability	Learning Environments
Environmental Literacy			Leadership and Responsibility	

The P21 framework addresses technological skills, however the outlined competencies are not dependent on digital technologies. Therefore, for the scope of this research, this framework was favored due to the focus on teaching and skills. The P21 framework is an integrated support system of teaching and learning, but focused research on what those systems look like in a contemporary classroom is scarce, especially in a Catholic

educational environment (Tellez, 2013). This study attends to that gap in research, and highlights the incorporation of Bloom's revised taxonomy with twenty-first century learning goals to understand shifting teaching practices of Catholic middle level teachers in support of twenty-first century education.

Technology in Education

The context of this research was within Catholic education, but to understand the influence of technology on teaching practices a broader perspective of technology in education framed the study. To that end, three current models of understanding technology integration served as the basis for this inquiry.

Technological, Pedagogical, and Content Knowledge (TPACK). Shulman (1986) redefined thinking about the knowledge teachers need for teaching with his intersecting construct of pedagogical knowledge and content knowledge (PCK). As technology was recognized as an invaluable tool for learning, the evolution of PCK moved to integrate technological knowledge in a similar way (Niess, 2011). To address teacher preparation in the use of technology, Mishra and Koehler's (2006) Technological, Pedagogical, and Content Knowledge (TPACK) framework provided a structure that described the relationships between technological, pedagogical, and content knowledge. Drawing on Shulman's PCK framework, TPACK introduced seven knowledge domains needed for effective teaching (Mishra & Koehler, 2006); (1) Technological Knowledge (TK), (2) Pedagogical Knowledge (PK), (3) Content Knowledge (CK), (4) Technological Pedagogical Knowledge (TPK), (5) Pedagogical Content Knowledge (PCK), (6)

Technological Content Knowledge, and (7) Technological Pedagogical Content Knowledge (TPACK) (Figure 2.3).

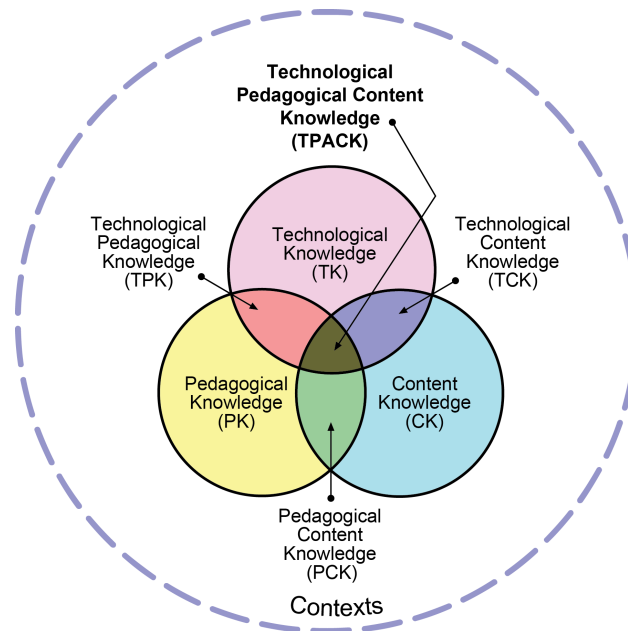


Figure 2.3: The TPACK Framework. Reproduced by permission of the publisher, ©2012 by tpack.org

TPACK prevails as the most common framework in conceptualizing teachers' current utilization of technology in education (Koehler, Mishra, Kereluik, Shin, & Graham, 2014). It has been used to assess teacher knowledge as it related to technology integration (Koehler & Mishra, 2009; Niess, 2011), employed as a framework for professional development programs (Harris & Hofer, 2011; Harris, Mishra, & Koehler, 2009), and applied as an analysis structure for technology use (Alayyar, Fisser, & Voogt, 2012; Archambault & Crippen, 2009; Chai, Koh, Tsai, & Tan, 2011; Dawson, Ritzhaupt, Liu, Rodriguez, & Frey, 2013). Two particular limitations of TPACK research include the understanding of TPACK in different disciplines and the relationship between TPACK and broader twenty-first century educational goals (Koehler et al., 2014). To

address those limitations, I first looked at TPACK across multiple content areas to highlight the instances teachers were integrating technology in their practice, and applied the Substitution, Augmentation, Modification, Redefinition (SAMR) model as a framework to further describe the teaching and learning experiences. I then used the International Society for Technology in Education teaching standards to further understanding the implications of technology integration aligned to twenty-first century educational goals.

Substitution, Augmentation, Modification, Redefinition (SAMR).

Puentedura’s (2006; 2010) Substitution, Augmentation, Modification, and Redefinition (SAMR) model aims to support educators through the integration of technology to transform teaching and learning experiences. The model highlights four levels of technology integration moving from the enhancement of teaching and learning (Substitution and Augmentation) to the transformation of teaching and learning (Modification and Redefinition). At the enhancement level the implementation of technology replaces non-digital tools with little changed functionality, contrasting with transformation that enables teachers and students to complete tasks not possible without technology. Table 2.2 summarizes Puentedura’s SAMR model with descriptions, and a practical educational application of the model.

Table 2.2
SAMR Model (Adapted from Puentedura, 2010)

Level	Definition	Description
--------------	-------------------	--------------------

Redefinition	<i>Transformation</i>	Tech allows for the creation of new tasks, previously inconceivable	Students use digital tools to interview author, collaborate with peers in different states/countries, or use digital mapping software to follow the storyline
Modification	<i>Transformation</i>	Tech allows for significant task redesign	Students use additional digital tools to summarize or synthesize understanding; for example, record a podcast or create a graphic visualization
Augmentation	<i>Enhancement</i>	Tech acts as a direct tool substitute, with functional improvement	Students use built in digital tools to enhance reading; for example a highlighter or dictionary
Substitution	<i>Enhancement</i>	Tech acts as a direct tool substitute, with no functional change	Students read a book using a digital reader

Although the SAMR model provides educators with a framework for technology implementation, in a tablet PC initiative van Oostveen, Muirhead, and Goodman (2011) found little teaching evidence at the transformation level (Modification and Redefinition). Furthermore, despite the use of technology, they reported no change in student learning experiences. Schugar and Schugar (2014) illustrated the differences between enhancement (Substitution and Augmentation) and transformation (Modification and Redefinition) with the implementation of interactive eBooks for classroom instructional and assessment purposes. They revealed two different uses of eBooks; the first simply replaced traditional books shifting the reading experience from paper based to digital

text. The second transformed the experience by teachers adding interactive, multi-touch features within the books; tasks that were significantly redesigned due to the integration of technology. They posited that further transformation would occur if students created and shared their own multi-touch books. Furthermore, Schugar and Schugar concluded that the application of the SAMR model has the potential to help teachers understand how implementing technology changes the learning experiences of students.

International Society for Technology in Education Standards for Teachers.

The International Society for Technology in Education (ISTE) aims to empower learners and improve teaching and learning in a connected world (“ISTE Standards for Teachers,” 2014). The ISTE Standards for Teachers (Standards•T), formally known as the National Educational Technology Standards for Teachers (NETS), evaluate “the skills and knowledge educators need to teach, work and learn in an increasingly connected global and digital society” (“ISTE Standards for Teachers,” 2014). The ISTE Standards•T follow the previously developed ISTE Standards for Students (Standards•S) situated in the context of twenty-first century learning, and provide a framework for educators to shift and align teaching practices with desired twenty-first century student outcomes. In addition to contributing a teaching perspective to twenty-first century education, the ISTE Standards•T, as summarized in Table 2.3, emphasize technology in teacher practice (Parker, Allred, Martin, Ndoeye, & Reid-Griffin, 2009).

Table 2.3
ISTE Standards•T

Standard	Description	Practice (selected examples)
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Facilitate and inspire student learning and creativity	Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity and innovation in both face-to-face and virtual environments	Engage students in exploring real-world issues and solving authentic problems using digital tools and resources
Design and develop digital age learning experiences and assessments	Teachers design, develop, and evaluate learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the Standards•S	Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity
Model digital age work and learning	Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society	Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations
Promote and model digital citizenship and responsibility	Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices	Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources
Engage in professional growth and leadership	Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources	Participate in local and global learning communities to explore creative applications of technology to improve student learning

The ISTE Standards•T provide a framework for educators to develop necessary twenty-first century teaching skills. The suggested methods of teacher practice within

each standard (“ISTE Standards for Teachers,” 2014) are a critical component of the Standards•T. Although the ISTE standards are widely adopted across teacher learning and technology professional development programs (Haynes, Baylen, An, Bradford, & d’Alba, 2014; Morris, 2013), there is limited research on the relationships between the standards and teachers’ classroom practice (Sam, 2011). Furthermore, research that was conducted found little or no influence, knowledge, or understanding of the implications of the ISTE standards on developing teacher practice in a digital age (Caglar, 2012; Sam, 2011). Therefore, I chose to apply the ISTE standards as a framework and coding analysis to further understand the use of technology in teaching based on accepted digital age educational standards, and attend to a gap in research based awareness of the ISTE standards.

Foundations of a Catholic School

Archbishop J. Michael Miller, the former Secretary for the Vatican’s Congregation for Catholic Education, detailed five elements of a Catholic school as necessary to maintaining and strengthening its identity (2006), which comprised the fundamental purpose and mission of Catholic schools. Compiled from the Holy See’s teaching on Catholic Schools, Miller first pointed out that a Catholic school must be inspired by a supernatural vision. Education must be more than an “instrument for the acquisition of information that will improve the chances of worldly success” (p. 178). Second, a Catholic school must be founded on a Christian anthropology, and to be worthy of the Catholic school name must be founded on Jesus Christ. He (Christ) must be the center of a school’s mission, and the gospel of Jesus Christ is “to inspire and guide the

Catholic school in every dimension of its life and activity” (p. 208). Miller acknowledged that many Catholic schools fall “into the trap of secular academic success” (p. 224) rather than emphasize Jesus Christ as a school’s vital principle. Third, a Catholic school must be animated by communion, and emphasize school as a community. A Catholic school must be true to its identity, and “express physically and visibly the external signs of Catholic culture” (p. 336). Additionally, prayer must be a normal part of the school day, and acts of religion should be perceived in every school. Fourth, a Catholic school should be imbued with a Catholic worldview and the “spirit of Catholicism should permeate the entire curriculum” (p. 336). A Catholic school must educate the whole person, therefore all instruction, not just religion, must be authentically Catholic in content and methodology. And fifth, a Catholic school must be sustained by gospel; that is teachers and administrators are responsible for creating a Catholic school climate. “Catholic educators are expected to be models for their students by bearing transparent witness to Christ and to the beauty of gospel.” (p. 478). I used Miller’s detailed elements of a Catholic school as a primary coding framework in that data analysis to explore and understand the Catholic identity of the school and participants.

Understanding the pressures Catholic schools are facing in the twenty-first century, Cook and Simonds (2011) provided a new framework to help Catholic schools remain relevant and competitive in today’s educational environment. They acknowledged the importance of Church documents as elements of inspiration and guidance, but noted that the practical application of such documents to modern educational structures is a challenge. Therefore, Cook and Simonds’ framework (Figure

2.4) “offers a coherent and relevant way of looking at Catholic identity and charism in contemporary schools” (p. 321).

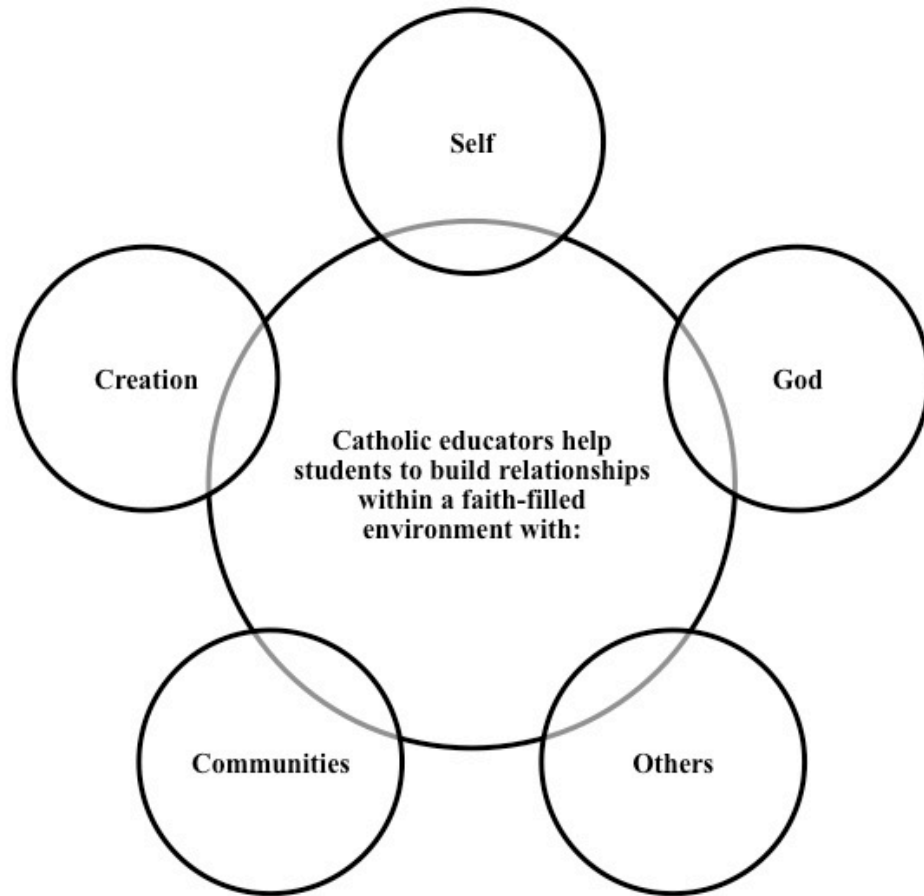


Figure 2.4. Adapted Framework for the Renewal of Catholic Schools (Cook & Simonds, 2011)

Built upon a culture of relationships, this model has the potential to help students understand the modern complexities between culture and faith. Furthermore, Cook and Simonds proposed that the application of the framework could help Catholic schools “clarify what sets them apart from all other schools, more effectively recruit students, and

enable their graduates to change the world by building relationships instead of fences” (p. 330).

Catholic Education in the Twenty-First Century

In response to school closures and declining enrollment, many Catholic educators and leaders are attempting to re-shape Catholic school learning for the twenty-first century (Kennedy, 2013; Nuzzi et al., 2012). “Catholic schools must integrate their vision with reality by retaining their purpose and character by moving forward academically and technologically” (Boland, 2000, p. 515). Responding to a rapidly advancing technological society requires Catholic schools to understand the balance between faith and educational values in a digital age. Recognizing the need to move from twentieth to twenty-first century teaching and learning, Zukowski (1997) suggested a complete paradigm shift in Catholic education. However, Antczak (1998) countered that the overriding religious purpose to teach the Gospel must be clear in all Catholic school activities. Many assert that Catholic schools need to evolve before they become irrelevant in a dynamic changing educational landscape (Kennedy, 2013; O’Keefe & Goldschmidt, 2014). However, despite early conversations recognizing that the twenty-first century calls for updated approaches in Catholic education, minimal research has been completed on the complexities of Catholic education in a digital age (Tellez, 2013; Zukowski, 2012). While technology allows for the innovation, connections, and collaborations called for by researchers (Kennedy, 2013; O’Keefe and Goldschmidt, 2014; Zukowski, 2012), understanding the growing need for technology integration in support of twenty-first century skill development, and how that melds with the

philosophy and purpose of Catholic education, emerges as an important issue as schools move forward with technology initiatives.

Although the research base on technology integration specifically in Catholic schools is small compared to the comprehensive public school research, studies that have focused on technology in Catholic education demonstrate noteworthy findings. Using survey data from 319 Catholic school principals, Gibbs, Dosen, and Guerrero (2008) examined technology in Catholic K-12 schools in Illinois. The study revealed that, while teachers in most schools used technology, overall teachers were not consistently engaged in technology as a tool for teaching. Galla (2010) similarly used data from administrators and focused on leadership styles, practice, and the process, procedures and actions of implementing technology. Through observations, interviews, and document collection from five leaders at three Catholic schools, he concluded that collaboration from all stakeholders involved in technology implementation was imperative for success. Zukowski (2012) focused on creative ways to encourage a positive digital culture. She highlighted social media, virtual worlds, digital libraries, and distance learning as ways to enhance learning in the twenty-first century. Cho and Littenberg-Tobias (2014) looked at a one-to-one initiative and acknowledged that technology yielded new collaboration opportunities, but reported that teachers questioned any increase in student learning due to the elements of digital distraction. Although valuable in exploring the implications of technology in Catholic education as they relate to increasing innovation in general education, a limitation of these studies was the absence of discussion of technology integration specifically within a Catholic school context.

CHAPTER THREE

Research Design and Methodology

Context

This study emerged when two Catholic K-8 schools received funding for a three-year partnership with a university that provided professional development, educational technology, and support for long-term planning. Concurrently, both schools developed strategic plans that focused on maintaining or increasing enrollment through the strengthening of academic standards and teaching practices, while promoting Catholic educational values.

The principal components of the university/school partnership included intensive teacher learning, increased student and teacher access to technology, promotion of technology-rich pedagogy, the assessment and dissemination of promising practice, and ongoing research on technology-rich learning. Each teacher in this study participated in a variety of professional development opportunities including facilitated faculty, team, and individual meetings, in-service days, workshops, and ongoing consultations focused on developing technology-rich skills, curriculum, and pedagogy. Teachers also had the opportunity to engage in graduate level course work through an action research project aimed at discovering how technology can enable increased student voice and engagement in learning.

Qualitative Case Study

The purpose of this research was to develop an in-depth understanding of middle level Catholic teachers' instructional practices. Given the intention of this study, to develop an *understanding*, I used a qualitative methodology (Patton, 2002) to explore the experiences, perspectives, and practices of individual cases - middle level Catholic educators. Mack, Woodson, MacQueen, Guest, and Namey (2005) described the strength of qualitative research in its ability to provide complex descriptions of behaviors, beliefs, opinions, emotions, and relationships of people. Additionally, it is an effective research design in order to understand social factors such as specific intangible environmental contexts.

I used case study, and more specifically multiple-case study, as a methodology for several reasons. First, I addressed a series of *how* questions in order to understand shifting teaching practices of Catholic middle level teachers in support of twenty-first century education. Second, my goal was to investigate a contemporary issue in-depth and within its real-life context. Third, I aimed to understand teaching practices, and such an understanding incorporates important contextual conditions. Fourth, I used multiple sources of data in order to triangulate the findings. Last, this study benefited from prior research on twenty-first century teaching and learning to guide the data analysis (Yin, 2014).

In order to explore different perspectives and practices I used multiple-case study, which provided in-depth descriptions and understandings of teaching practices as they relate to twenty-first century education, technology, and Catholic education. I examined

several cases (teachers) over the same time period through detailed data collection including semi-structured interviews, observations, survey, and historical and field evidence. I applied cross-case analysis across individual teachers, and teacher comparison groups, to deepen the understanding and explanation of teaching practices (Miles & Huberman, 1994).

Consistent with multiple-case study design, the time frame of the research was an important factor to consider. As Creswell (2013) suggested, deciding the boundary of time in case study research can be challenging. The beginning of this study was defined by the start of a three-year technology initiative. Data collection began prior to the implementation of any new technologies (that resulted from the initiative) in order to extrapolate understandings of twenty-first century teaching and learning prior to increased access to digital tools and resources. Collecting and analyzing data on teachers' instructional practices *before* integrating new technologies attended to a gap in reviewed literature; specifically literature in Catholic education.

Selection and Description of Research Sites and Participants

In order to determine teacher participants, I first identified two schools based on (1) their Catholic education affiliation, (2) their location and proximity to each other, and (3) their recent adoption of a technology initiative. Table 3.1 provides school level data for both school sites, followed by detailed descriptions of the schools.

Table 3.1
School Level Data

	Saint Martha's	Saint Stephen's
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Building Configuration	Pre-K – 8th	Pre-K – 8th
Total Number of Students	259	219
% Free/Reduced Lunch	10.55%	17.26%

Saint Martha’s. Saint Martha’s is an accredited, private Catholic school, sponsored by the Sisters of Mercy of the Americas Northeast Community. The foundation of Mercy education dates back to the nineteenth century inception of the first Sisters of Mercy under the leadership of Catherine McAuley, an Irish Catholic laywoman (“Sisters of Mercy,” 2013). Upon its establishment, Mercy education was marked by a special concern for the needs of the poor, especially women and children, and the tradition of Mercy education can be found in elementary schools, secondary schools, and higher education environments throughout 20 states in the United States (“Sisters of Mercy,” 2013). Embracing the values of Mercy education, Saint Martha’s opened its doors in 1963 to over 200 students in grades K-8. Stated in the public mission statement, Saint Martha’s is committed to providing a quality, values-centered education in the Catholic tradition through an educational philosophy that prioritizes intellectual, spiritual, emotional, and physical growth of children. The school promotes six core values: (1) Compassion and Service, (2) Personal and Educational Excellence, (3) Concern for Human Dignity, (4) Global Vision and Responsibility, (5) Spiritual Growth and Development, and (6) Collaboration. In 2012 Saint Martha’s adopted a three-year strategic plan that particularly emphasized academic programs and technology integration. The following year, October of 2013, Saint Martha’s entered into a

partnership with a local university that provided funding and resources for professional development, educational technology, and support for long-term planning. At the start of this study, Saint Martha's teachers and students had access to classroom interactive white boards, a shared classroom cart of laptops, and a shared computer lab with desktops. New technologies introduced included individual teacher tablets, individual teacher laptops, and a shared cart of student tablets.

Saint Stephen's. Saint Stephen's is an accredited, private Catholic Diocesan school situated in a suburban community in the Northeast. The establishment of Saint Stephen's dates back to 1870 as part of the Saint Stephen's Parish. Local parish population growth, and a corresponding demand for Catholic education, contributed to the growth of Saint Stephen's school. In 1941 the parish school was supplemented by a new parochial school, with a modern addition erected in 1966. The core of Diocesan education is faith in every student, and recognition of dignity. Embracing the values of Catholic Diocesan education, part of Saint Stephen's mission is to educate the whole person in light of the Catholic Faith, through educational programs that promote Christian values, academic excellence, and personal responsibility. In November of 2013, Saint Stephen's entered into a partnership with a local university (the same as Saint Martha's) that provided funding and resources for professional development, educational technology, and support for long-term planning. At the start of this study, Saint Stephen's teachers had access to a shared computer lab with desktop computers, and a shared cart of netbooks. During the second year of the partnership, Saint Stephen's decided to implement a middle school (6-8) one-to-one (1:1) technology initiative. That

is, all middle school students and teachers were provided a portable, internet capable tablet for continuous use at home and school. New technologies introduced included individual teacher laptops, classroom TVs, and the individual student and teacher tablets.

Within the specified schools, I used purposeful sampling and identified specific teachers as particularly rich cases to illuminate the research questions. I selected individual teachers based on whether or not they taught middle-level students, they were active participants in the partnership, and consented to ongoing research. Table 3.2 provides individual data for all cases. In this study, the participants are predominately White; therefore ethnicity was not reported so not to compromise confidentiality.

Table 3.2
Teacher Data

	Name	School	Content Area(s)	Gender	Age (Range)	Years Teaching (Range)	State Certification
Case 1	Laura	Saint Martha's	Religion	F	>50	<5	Yes
Case 2	Elliot	Saint Martha's	Science	M	30-39	5-9	Yes
Case 3	John	Saint Martha's	Math	M	40-49	<5	No
Case 4	David	Saint Martha's	Social Studies	M	40-49	10-20	Yes
Case 5	Sharon	Saint Stephen's	Religion, Math, Social Studies	F	>50	>20	No
Case 6	Mary	Saint Stephen's	French, Religion	F	>50	>20	No
Case 7	Scott	Saint Stephen's	Religion, English	M	30-39	5-9	Yes
Case 8	Johanna	Saint Stephen's	Science	F	>50	5-9	No

Data Collection

Consistent with multiple-case study design, I applied various data collection methods over a bounded period of time (Creswell, 2014). Data sources included semi-structured interviews, observations, survey, and historical and field evidence, which provided additional background and information about each school and teacher contributing essential contextual information about each case (Marshall & Rossman, 2011; Yin, 2014). Data were collected from the Fall of school-year 2013/14 through the Fall of school-year 2014/15.

Interviews. I used a semi-structured interview protocol to interview individual teachers for approximately 60 minutes twice over the course of the study. I adapted the interview protocol from Harris and Hoffer's (2011) Technology, Pedagogy, and Content Knowledge Interview Protocol (Appendix B). Questions primarily focused on teachers' classroom use of technology, opinions on benefits and challenges, and perceived impact on student learning. I added questions that addressed teachers' backgrounds, personal technology use, and educational and school values. Individual interviews were digitally recorded and transcribed, yielding 14 hours of audio and 182 pages of transcripts.

In addition to individual semi-structured interviews, I conducted ongoing informal, conversational, and focus group interviews. As described by Marshall and Rossman (2011), these interviews allowed for conversations that highlighted teachers' classroom technology use. I explored general topics that illustrated teachers' perspectives as opposed to framing questions based on my views (Marshall & Rossman, 2011).

Observations. Observation played a critical role in data collection to better understand individual teaching practices. Observation provided deeper insight of teachers' teaching methods, and helped to "gain insider views and subjective data" (Creswell, 2013, p. 167). I was actively involved with each site from the onset of the initiative; therefore observations took two different forms. First, as a participant as observer (Creswell, 2013) I was an active contributor to teachers' lesson planning and classroom activities. In the nature of the partnership, I facilitated on-going teacher learning opportunities that included faculty professional development workshops, team or content level meetings, graduate level course work, and individual consultations. In these different capacities, I was involved with each teacher approximately four times per month over the course of the study. Second, as a nonparticipant observer, I conducted formal classroom observations and recorded data without direct involvement with teachers (Creswell, 2013). During formal observations, I took detailed notes on curriculum topics, student outcomes, instructional strategies, learning activities, technologies used, and environmental descriptions (e.g. classroom set up, number of students) (Appendix C). I formally observed each teacher twice for approximately 50 minutes per observation, for a total of 750 observational minutes.

Survey. I administered a 47-item survey, the Levels of Teaching Innovation (LoTi) Digital-Age Survey (Appendix D) ("LoTi," 2011). Teachers took the survey twice; once in the Fall of school-year 2013/14, and again in the Fall of school-year 2014/15. The LoTi Digital-Age Survey is aligned to the ISTE Standards•T (Moersch, 2011), and thus provided an essential framework for further understanding teaching

practices in a digital age. The LoTi Digital-Age Survey is a validated instrument for the evaluation of teacher practice (Stoltzfus, 2009), and measured the levels of teaching innovation (LoTi), personal computer use (PCU), and current instructional practices (CIP) of the participants. The first part of the survey asked participants a series of demographic questions that provided general demographic data for the population. The second part of survey included 37 questions related to technology use and teaching practices. Each question offered eight responses on a scale of 0 to 7: 0 (Never), 1 (At least once a year), 2 (At least once a semester), 3 (At least once a month), 4 (A few times a month), 5 (At least once a week), 6 (A few times a week), and 7 (Daily). This scale was used for all questions to determine the results for the LoTi, PCU, and CIP scores, as summarized in Tables 3.3 and 3.4 (“LoTi,” 2011).

LoTi. The LoTi framework focused on instruction, assessment, and the effective use of digital tools in the classroom (“LoTi,” 2011). Score levels are based on the ISTE Standards for Teachers (Moersch, 2010) and ranged in levels from 0 to 6, as described in Table 3.3.

Table 3.3
LoTi Framework adapted from LoTi, 2011

Level	Technology Use	Instructional Methods
0: Non-Use	The use of digital tools in the classroom is non-existent	Instructional focus ranges from direct instruction to a collaborative student-centered environment
1: Awareness	Digital tools are used by the teacher for curriculum management or by the students as a reward unrelated to classroom instruction	Instructional focus supports lecture and lower cognitive skill development
2: Exploration	Digital tools are used for extension activities	Instructional focus emphasizes direct instruction

3: Infusion	Digital tools are used for teacher-directed tasks	Instructional focus emphasizes higher order thinking and a variety of thinking skill strategies
4a: Integration (Mechanical)	Digital tools are used to answer student-generated questions	Students engage in exploring real-world problems and instructional focus emphasizes applied learning
4b: Integration (Routine)	The use of digital tools is inherent and embedded in the learning process	Students are fully engaged; instructional focus emphasizes learner-centered strategies
5: Expansion	Digital tools are used with sophistication and support students' levels of complex thinking	Collaboration extends beyond the classroom
6: Refinement	There is no division between instruction and digital tool use	The instructional curriculum is entirely learner-based

PCU. The PCU framework measured personal fluency with digital tools and resources (“LoTi”, 2011). The PCU level was reported on a scale of 0 to 7 (see Table 3.4), with a higher intensity level suggesting, “the depth and breadth of current and emerging digital tool use (e.g., multimedia, productivity, desktop publishing, web-based applications) in the classroom increases proportionally as does the teacher's advocacy and commitment level for their use” (“LoTi”, 2011).

CIP. The CIP framework measured teachers’ instructional practices related to a learner-based classroom approach (“LoTi”, 2011). The CIP level was reported on a scale of 0 to 7 (see Table 3.4), with a higher intensity level suggesting, “teachers begin to embrace instructional strategies aligned with student-directed learning, varied assessment strategies, authentic problem-solving opportunities, differentiated instruction, and complex classroom routines” (“LoTi”, 2011).

Table 3.4
CIP and PCU Frameworks adapted from LoTi, 2011

Intensity Level	PCU Framework	CIP Framework
0	Indicates that the participant	The student is not involved in a

	does not possess the inclination or skill level to use digital tools and resources for either personal or professional use	formal classroom setting (e.g., independent study)
1	Indicates that the participant demonstrates little fluency with using digital tools and resources for student learning	The participant's current instructional practices align exclusively with a teacher-directed approach relating to the content, process, and product or instruction
2	Indicates that the participant demonstrates little to moderate fluency with using digital tools and resources for student learning	Supports instructional practices consistent with a teacher-directed approach relating to the content, process, and product, but not at the same level of intensity or commitment
3	Indicates that the participant demonstrates moderate fluency with using digital tools and resources for student learning	Supports instructional practices aligned somewhat with a teacher-directed approach
4	Indicates that the participant demonstrates moderate to high fluency with using digital tools and resources for student learning	The use of a teacher-directed approach is the norm, but there is an increased frequency of student-directed decision-making or input into the content, process, or product of instruction
5	Indicates that the participant demonstrates a high fluency level with using digital tools and resources for student learning	Instructional practices tend to lean more toward a student-directed approach. The essential content embedded in the standards emerges based on students "need to know" as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills
6	Indicates that the participant demonstrates high to extremely high fluency level with using digital tools and resources for student learning	The essential content embedded in the standards emerges based on students "need to know" as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills
7	Indicates that the participant possesses an extremely high	The participant's current instructional practices align

fluency level with using digital tools and resources for student learning	exclusively with a student-directed approach to the content, process, and product of instruction
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Data Analysis

My purpose of this research was to explore teaching practices of Catholic middle level educators in support of twenty-first century education. I considered seven research questions addressing teaching practices that support twenty-first century education through three distinct scholarly articles. I analyzed data through different frameworks to attend to the research questions within the articles. I used a common format in each process of interview and observation data transcription, triangulation with a third data source, and coding with specific theoretical frameworks. The specific method for each article is presented below.

Article One: Teaching Practices to Support Twenty-First Century Education in Catholic Middle Level Classrooms. I applied Yin’s (2014) five-phased analytic cycle for data analysis to answer the first research question, and an emergent themes process to address the second question. The analytic procedure for each question is presented.

How do middle level Catholic school teachers interpret and apply twenty-first century teaching practices? First, I compiled data (interviews, observation notes, and historical and field evidence) into chronological order per case. For historical and field evidence, I separated documents or evidence by case or context. For example, if evidence was directly related to a school, I included that evidence for each case from that

school. Second, I disassembled data into smaller fragments representing each case. I reassembled data, the third phase, into codes and themes. I repeated the second and third phase several times for both individual and cross-case analysis. For individual analysis I created a conceptually ordered display (Miles & Huberman, 1994) separated by cases, and clustered concepts drawn from the literature that related to the first research question (Table 3.5). I used the P21 framework (Partnership for 21st Century Skills, 2014) as a primary coding structure for each case. More specifically, I used evidence of creativity, critical thinking, communication, and collaboration as a prior codes. I used Bloom’s revised taxonomy (Anderson & Krathwohl, 2001) as a second coding framework within each P21 code (Table 3.5). For example, after coding for creativity for one case, I coded evidence of creativity with the cognitive domains of Bloom’s revised taxonomy: remembering, understanding, applying, analyzing, evaluating, and creating. For cross-case analysis I used a different conceptually ordered display but only included the cognitive characteristics that appeared in multiple cases. From that, I created a case ordered display (Table 3.6) according to variables of interest to understand differences across cases (Miles & Huberman, 1994). I interpreted the data, the fourth phase, using the with-in, and cross-case, displays.

Table 3.5
Conceptually Ordered Display for Individual Case Analysis (selected examples from interview data)

	Creativity	Critical Thinking	Communication	Collaboration
(Coded P21 Evidence with Bloom’s Revised Taxonomy)				
Case 1 (Laura)	Interests; creation; do something about it. Where education is going.	Looking at different religions; inquiry learning/PBL religion unit	Interests drive learning community	Teacher is not the expert... learn from each other

Case 2 (Elliot)	Rap activity – demonstrate knowledge/learning of content	Role of a teacher: skepticism of information	Communication with community; authentic relationships with students	Goal of teaching: developing relationships
Case 3 (John)	Application to real life – bike activity	Development of student character – application of that to math	Instructional communication	Peer-peer questions
Case 4 (David)	PBL examples in lessons	Most important goal of teaching. Understanding application of learning style to life	Articulate ideas using written and oral expression	Group work in PBL
Case 5 (Sharon)	Examples of compassion – magazine collage	Meditation – evaluation of place in the world (Religion)	Circle of power and respect	Relationship building – education of the whole child
Case 6 (Mary)	Picture displays of story interpretation	Evaluation of content	Transmission of material in all aspects of life; do not use English in French (authenticity in communication)	Pen-pals
Case 7 (Scott)	Where does it fit with Religion? English: Storyboard	Student reflections on place and relationships	Teacher/student communication – role reversal?	Peer editing/feedback
Case 8 (Johanna)	Different data displays	Application of data to similar setting	Written documentation	Group lab work

Table 3.6
Case Ordered Display for Cross-Case Analysis (selected examples from observation data)

	Remembering	Understanding	Applying
Case 1 (Laura)	Researching facts	Describing meaning of facts	Understanding Peace conference

Case 2 (Elliot)	Vocabulary review; scientific process	Application of process to lab	Demonstration of understanding in an experiment
Case 3 (John)	Content development through lecture	Homework (room sketch activity)	Transformation of sketch to scale
Case 4 (David)	Direct instruction of facts	Individual explanations of facts	Combining facts to tell a story; applying process to other activities
Case 5 (Sharon)	Direct instruction of content	Problem practice	Homework/traditional assessment
Case 6 (Mary)	Vocabulary Review	Interpretation of vocab through pictures	Demonstration of understanding
Case 7 (Scott)	Writing process	Individual editing	Peer share/edit; applying process to other assignments
Case 8 (Johanna)	Description of data	Explanation of data displays	Using data to predict similar experiment

How do contextual factors influence teachers' instructional practices as they align to twenty-first century educational goals? To address the second research question, I analyzed sorted data for similarities and differences between cases. With data organized into case and cluster characteristics, I looked for emergent themes or categories related to contextual factors. That is, specific environmental, physical, or social considerations that may have influenced opinions or practice. Data illuminated three recurring themes that highlighted those similarities and differences, teacher background, content area, and environment.

Article Two: The Influence of Technology Integration on Middle Level Catholic Teachers' Instructional Practices. In order to explore both research questions

in the second article, I followed a qualitative analytic procedure of organizing the data, immersion in the data, generating categories and themes, coding the data, searching for alternative understandings, and reporting (Marshall & Rossman, 2011). Specific analysis related to each research question is presented below.

How are Catholic educators integrating technology in their teaching? The Technological, Pedagogical, and Content Knowledge (TPACK), and Substitution, Augmentation, Modification, and Redefinition (SAMR) frameworks provided coding structures to answer the first research question. I used an individual case analysis process (Miles & Huberman, 1994) to highlight instances from interview and observation data when each teacher was integrating technology in his or her practice. I then coded those specific occurrences with the SAMR model to understand the levels of technology integration (Figure 3.1).

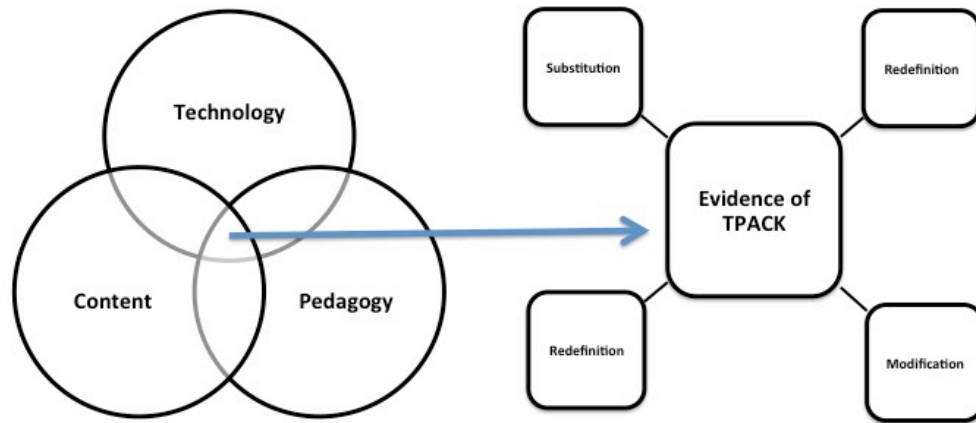


Figure 3.1. TPACK and SAMR coding structure

Due to my ongoing relationships with the participants, I used survey data as an objective source to either support or contradict interpretive qualitative findings. I applied individual teacher survey data (specifically the PCU score) to further understand the context of each case, and interpreted and compared scores to the other data sources.

How does the use of technology influence teachers’ instructional practices? To answer the second research question, I used Yin’s (2009) case-oriented approach for cross-case analysis and applied the ISTE Standards•T as a framework. I used the ISTE Standards•T in order to understand the skills and knowledge participants demonstrated to teach, work and learn in an increasingly connected global and digital society (“ISTE Standards for Teachers,” 2014). I studied Mary as an in-depth case, and looked for

similar or contrasting patterns throughout the other cases. I chose Mary's case as the reference example because her data highlighted all ISTE Standards•T in her teaching, as opposed to the other cases. Then I used survey data (specifically the LoTi scores) to enhance descriptions and triangulate findings. Survey data also complemented emergent patterns in understanding teachers' instructional practices (the CIP score) utilizing technology.

Article Three: Exploring the Balance Between Catholic Schools' Educational Goals, Teaching Practices, and Technology Integration. I explored the research questions in the third article by asking teachers to reflect on the school mission statement, their personal instructional practices, and the influence of technology on their teaching as it related to Catholic educational goals. Data from observations provided additional supporting or contradicting evidence. I analyzed the data addressing each research question by following a general inductive approach through the emergence of themes embedded in frameworks (Suter, 2012). First, I used a priori coding based on Miller's (2006) elements of a Catholic school, and Cook and Simonds' (2011) framework for the renewal of Catholic schools. Second, I developed additional codes and themes on the basis of emerging information collected through the various data sources (Creswell, 2014) (Figure 3.2). Individual and cross-case analysis of the data revealed four dominant themes: education of the whole person; perspectives on relationships; student growth; and traditional versus twenty-first century teaching.

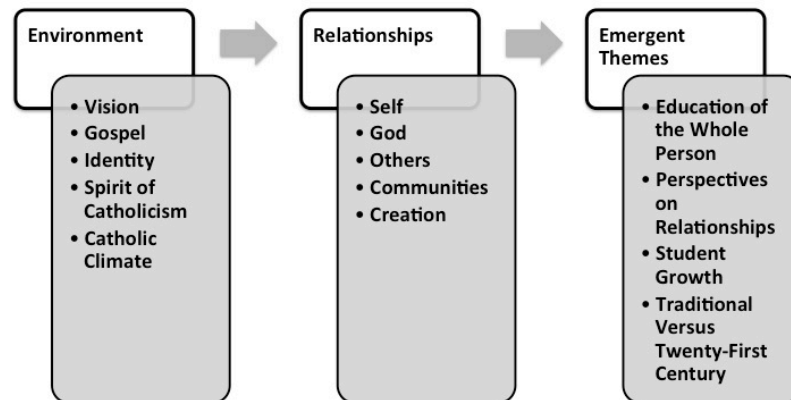


Figure 3.2. Coding Framework

Individual case analysis within each article yielded valuable personalized data about each teacher. Those data guided the respective research questions related to individual instructional factors. Cross-case analysis within each article allowed for data comparison between cases and the emergence of relevant themes to gain a deeper understanding of twenty-first century teaching practices. Within each article, I present the findings then follow with a discussion of themes.

Limitations

Although qualitative research was best suited for this inquiry, several limitations should be noted. First, this study was limited to two Catholic schools in a Northeastern community; therefore, generalizations about findings should not be made to other educational settings. Second, the majority of the teachers were White; therefore racial diversity is not well represented in this research. Third, this study was bounded by a

specific time frame (Creswell, 2013). Although findings and themes were applicable to teachers' current instruction, it is difficult to make future predictions of teachers' practices. Fourth, although survey provided valuable objective data on teachers' instructional practices, it was problematic as an accurate gauge for instruction for teachers that taught in more than one subject. However, I analyzed results through an interpretive methodology and member checking helped to control for survey limitations. Last, consistent with qualitative research, my direct involvement with the teachers may have resulted in personal biases and opinions in data analysis (Creswell, 2013).

To limit potential areas of bias, I applied several measures of trustworthiness. I triangulated different data sources of information and presented negative or discrepant information (Creswell, 2013); I spent a prolonged period of time with each teacher to develop an in-depth understanding of each case (Yin, 2014); I obtained rich data of each teacher gathering thick description to convey the findings (Geertz, 1973; Creswell, 2013); and I applied multiple coding strategies to enhance transferability of the findings (Miles & Huberman, 1994).

Researcher's Role and Trustworthiness

Creswell (2014) described qualitative research as an interpretive process where the researcher is involved in a sustained experience with the participants. This level of involvement has the potential to introduce a range of personal issues and biases in the research process. Therefore, it is necessary to explicitly identify personal involvement, values, and backgrounds that might have the potential to contribute to data interpretations within the study. I am a member of the professional development and research team

within the funding university, and throughout this study was directly involved with the two Catholic schools and participating teachers on all aspects of the partnership. I am a practicing Catholic and I attended a private, Catholic university for my graduate studies where the educational values and traditions were grounded in the Catholic faith. I am also a former middle and secondary mathematics teacher, and have preconceived opinions about pedagogy, and the influence of technology on teaching practices.

In order to address the potential for bias in this study and attend to trustworthiness, I applied Guba's (1981) four constructs of trustworthiness: credibility, transferability, dependability, and confirmability. For credibility in data collection and analysis, I used multiple validation strategies (Creswell, 2013). First, rich, thick description provided details about the sites, participants, teaching practices, and technology initiative, allowing for a deeper understanding of any perceived influences or changes in teaching practice (Geertz, 1973; Creswell, 2014). Second, the triangulation of the data allowed for corroborating evidence from multiple sources, which provided validity to the findings (Miles & Huberman, 1994). Third, prolonged engagement and persistent observations at the sites promoted trust with the participants and "informed decisions about what is salient to the study" (Creswell, 2013, p. 251). And last, member checking the observations, interviews, and survey results allowed participants to comment on the findings (Creswell, 2014).

In the nature of qualitative research, it is nearly impossible to generalize results to a broader population (Shenton, 2004). Thus, to attend to the issue of transferability of the findings, I provided sufficient detail about the context of the research, sites, participants,

and data collection process. By employing such a strategy, the results may be understood within the context of similar settings (Miles & Huberman, 1994); perhaps other Catholic schools in comparable geographic locations undertaking similar technology initiatives. I addressed the dependability of this study - the likelihood that repeated work would yield similar results - by providing a thorough description of the methodology (Shenton, 2004).

In addition to an in-depth methodological description, and the triangulation of data, I attended to confirmability through the recognition of the limitations of the study, and description of potential biases. Understanding and revealing prior dispositions can possibly reduce the potential for researcher bias, and ensure the findings are based on the experiences of the participants (Miles & Huberman, 1994).

Throughout the process of this study, I took great care to protect the individual privacy of the participants. I followed the provisions laid out by the Institutional Review Board (IRB) from the College of Education and Social Services at the University of Vermont. The participants consented to research (Appendix A) on the influence of technology on teaching practices, and all collected data were kept on an encrypted computer or secured in a locked cabinet. Furthermore, upon transcription of data, all names and locations were changed to protect confidentiality.

Conclusion

Using multiple-case study as a research design, my purpose of this research was to explore teaching practices of Catholic middle level educators in support of twenty-first century education. As such, I addressed the following research questions in three articles, chapters four, five, and six respectively:

Article One: Teaching Practices to Support Twenty-First Century Education in Catholic Middle Level Classrooms

1. How do middle level Catholic school teachers interpret and apply twenty-first century teaching practices?
2. How do contextual factors influence teachers' instructional practices as they align to twenty-first century educational goals?

Article Two: The Influence of Technology Integration on Middle Level Catholic Teachers' Instructional Practices

3. How are Catholic educators integrating technology in their teaching?
4. How does the use of technology influence teachers' instructional practices?

Article Three: Exploring the Balance Between Catholic Schools' Educational Goals, Teaching Practices, and Technology Integration

5. How do middle level Catholic educators perceive their teaching practices align to Catholic educational goals?
6. How does technology support middle level Catholic educators' instructional goals and practices as they relate Catholic educational goals?
7. How does technology challenge middle level Catholic educators' instructional goals and practices as they relate Catholic educational goals?

In the form of three scholarly articles, I present findings and discussions for each research question in the next three chapters, then I conclude in chapter seven with a description of

implications related to Catholic educators, policy makers, and directions for future research.

CHAPTER FOUR

Scholarly Article 1

Teaching Practices to Support Twenty-First Century Education in Catholic Middle Level Classrooms

Introduction

In the twenty-first century, Catholic schools are the largest sector of the private and faith-based educational market, and the Catholic religion is the largest Christian domination in the United States (Hunt & Carper, 2012). Catholic school education is rooted with traditional and standard educational values, and a commitment to the development of character (Kennedy, 2013). Over the last two decades however, K-12 Catholic school enrollment has steadily declined (Nuzzi, Frabutt, & Holter, 2014). Demographic shifts, a more secularized society, the rise of charter schools, and financial burdens have contributed to this decline (Kennedy, 2013; Nuzzi et al., 2014). Therefore, Catholic schools are not only in a position of survival; in order to remain competitive among the many different schooling options, they must set themselves apart from other schools by offering unique learning opportunities in conjunction with Catholic educational values.

Miller's (2006) overview on the teaching in Catholic schools highlighted the challenges of maintaining the sustainability of Catholic schools and education. Before the turn of the Century, Zukowski (1997) suggested a complete paradigm shift in Catholic education, rethinking school as an institution of learning rather than an institution of instruction. However, Antczak (1998) argued that even if the curriculum of

Catholic schools changes, the overriding religious purpose to teach the Gospel must be clear. Despite these early conversations, minimal research has been conducted on the complexities of Catholic education in the twenty-first century (Tellez, 2013). There is, however, an emerging body of work in this area. For example, Miller (2006) and Cook and Simonds (2011) stressed the importance of Catholic identity and educational sustainability in the twenty-first century in response to the modern decline of Catholic school enrollment. Kennedy (2013) emphasized the decline of Catholic enrollment stating that Catholic educational leaders must make a choice, to “innovate or die” (p. 2). O’Keefe and Goldschmidt (2014) stressed that, by not evolving, Catholic education will become irrelevant in a modern world. They called attention to the crisis of declining enrollment and highlighted cases of individual Catholic schools implementing innovative practices in their unique approach to Catholic schooling. They focused on updated teaching practices, a broader approach to teaching the whole child, and partnerships as a form of community building and collaboration (O’Keefe & Goldschmidt, 2014).

As many Catholic educators and leaders are attempting to re-shape learning for the twenty-first century, the purpose of this study was to understand shifting teaching practices of Catholic middle level teachers in support of twenty-first century education. To that end, I posed two research questions: (1) How do middle level Catholic school teachers interpret and apply twenty-first century teaching practices? (2) How do contextual factors influence teachers’ instructional practices as they align to twenty-first century educational goals?

Theoretical Framework

To support the exploration and understanding of twenty-first century teaching practices, I drew from two bodies of work. First, I reviewed current research on the differences between twentieth and twenty-first century learning needs, and the associated pedagogical trends and strategies. Second, I drew from two different twenty-first century educational frameworks to help describe and explain the changes in teaching and learning.

Information transfer through direct instruction is a teaching method that dominated education for centuries. The design of twentieth century teaching emphasized time based memorization and retelling of facts. Students were passive learners of content knowledge, and demonstrated understanding through routine summative assessment. This construct of teaching and learning supported twentieth century educational goals through student preparation in the use of routine skills (Pacific Policy Research Center, 2012) for jobs that consisted of procedural cognitive work and labor (Dede, 2010b). Dede (2010) suggested the twenty-first century “has seen a dramatic shift in the economic model for industrialized countries” (p. 2), and the successful worker, therefore, needs skills that support creativity, flexibility, and fluency in information and communication technologies. Schleicher (n.d.) called attention to a fast-changing world where educational success depends on knowledge application to modern situations. Therefore, the primary challenge for education is “to align curriculum and learning to new economic and governance models based both on a global, knowledge-based workplace” (Dede, 2010 p. 4), in order to prepare students for future work and life that

emphasizes information and knowledge construction opposed to standardized systems and manufacturing. Fullan and Langworthy (2014) compared “old and new pedagogies” and highlighted old pedagogies that focused on technology use, pedagogical capacity, and content knowledge to achieve the primary goal of content mastery (p. 3). In contrast, new pedagogies modeled teacher student partnerships in the learning process (Fullan & Langworthy, 2014). New pedagogies are “used to discover and master content knowledge and to enable the deep learning goals of creating and using new knowledge in the world.” (Fullan & Langworthy, 2014, p. 3)

The twentieth century models of passive learning through information consumption from a teacher centered approach are dated as digital technologies increasingly allow instant access to information (Gunn & Hollingsworth, 2013). Some studies of technology integration highlighted the necessary shift in teaching and learning strategies toward dynamic learning environments (Sauers & McLeod, 2013; Shapley et al., 2009). However, many technology rich environments do not develop pedagogy suitable toward dynamic learning (Daniels et al., 2014; Galla, 2010; Gibbs et al., 2008), with technology utilized as a modern learning tool but content delivery remaining in a twentieth century model (Cuban, 2006; Gunn & Hollingsworth, 2013; Weston & Bain, 2010a). Research on technology in education indicated undeniable use in classrooms, but yielded diverse perspectives on actual effectiveness in consideration of the deeper teaching and learning goals and outcomes of twenty-first century education (Gunn & Hollingsworth, 2013). With new standards replacing basic skill competencies (Pacific Policy Research Center, 2012), schools are tasked with shifting curriculum and teaching

to support the broad idea of twenty-first century learning and future work preparation (Dede, 2010). It follows that a shift toward twenty-first century teaching and learning environments requires a deeper understanding of those environments, and the associated teaching and learning goals. Furthermore, considering the mixed research results focused on technology integration, it is necessary to understand twenty-first century education regardless of technological tools. Therefore, this study focused primarily on the broader goals of twenty-first century education and not necessarily the adoption or integration of new technologies.

Twenty-First Century Educational Frameworks

Bloom's Revised Taxonomy. The widespread familiarity with Bloom's taxonomy (Lightle, 2011) provided a foundation for understanding contemporary educational objectives. Bloom's original cognitive knowledge domain was broken down into six levels, each dependent on the one below (see Figure 1) (Bloom, 1956; Munzenmaier & Rubin, 2013). Based on new understandings of teaching and learning in the twenty-first century, Anderson and Krathwohl (2001) updated the original taxonomy and focused on the dimensions of knowledge levels and cognitive processes (Anderson & Krathwohl, 2001). The knowledge dimension classified four types of knowledge that may be required in student learning: factual, conceptual, procedural, and metacognitive (Anderson & Krathwohl, 2001). The cognitive processes focused on a continuum of thinking skills: remembering, understanding, applying, analyzing, evaluating, and creating (see Figure 4.1). Within the cognitive processes, one of the primary differences

between the original and revised taxonomies was the change in hierarchical named levels from nouns to verbs (Anderson & Krathwohl, 2001).

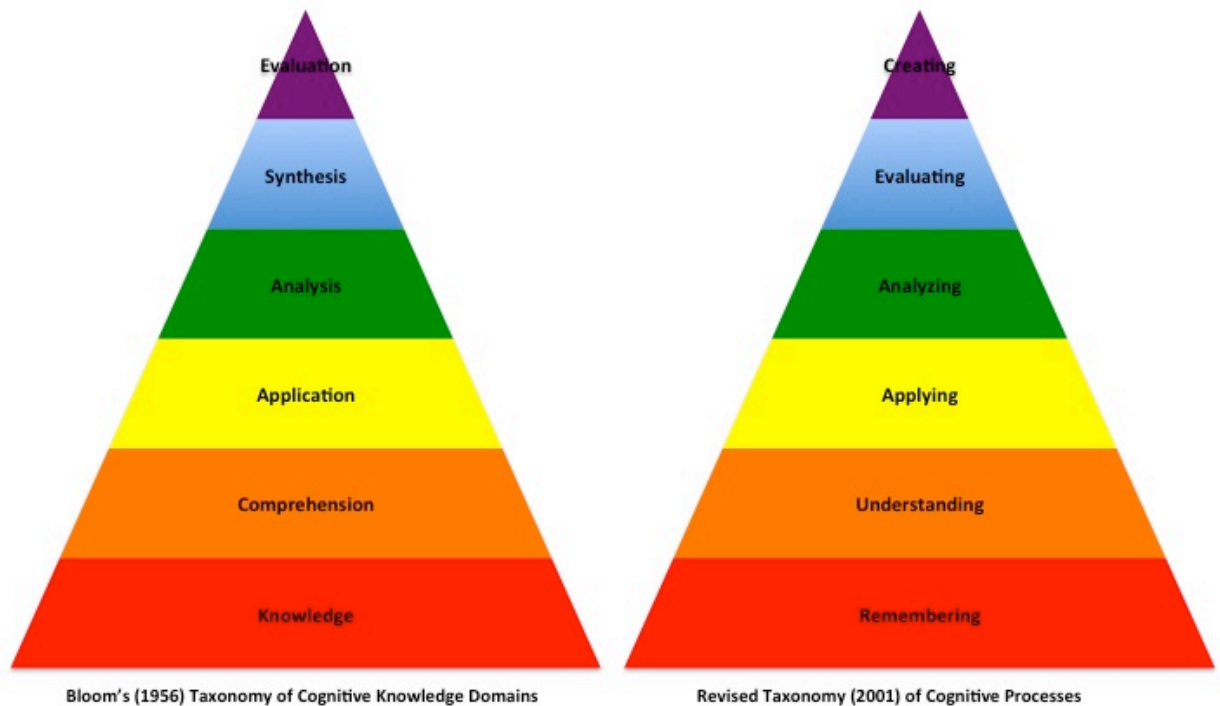


Figure 4.1. Bloom's (1956) original taxonomy of cognitive knowledge domains, and Anderson and Krathwhol's (2001) revised taxonomy of cognitive processes.

I chose to use the Bloom's revised taxonomy as a framework whereas it is inclusive of what might be considered traditional teaching as well as twenty-first century practices. The adaption has the potential to change classroom objectives to describe thinking *processes* opposed to behaviors (Munzenmaier & Rubin, 2013). Furthermore, since the modification of Bloom's taxonomy, and the extensive adoption of technology in

education, new modifications to the revised taxonomy have included ways to use digital tools at each revised cognitive level (Churches, 2009). However, in the context of this research the focus is on the 2001 updated cognitive processes; the premise is that to fully understand how to foster educational environments of flexibility and creativity in student learning, it is necessary to understand the associated teaching modifications regardless of new technologies. Although the revised taxonomy provides a contemporary approach to understanding cognitive development, shifting teaching practices toward inquiry-oriented environments remains a challenge (Cuban, 2006; Dede, 2010b; Houghton, n.d.). In order to understand teaching practices that support twenty-first century learners, one must first understand learning goals and outcomes for the twenty-first century.

P21: Twenty-first Century Skills. The shift from twentieth to twenty-first century educational thinking prompted educational leaders and researchers to challenge the success of a teaching model that emphasized teacher-centered learning through scripted curriculum (Becker & Ravitz, 1999). Many organizations have promoted twenty-first century standards or competencies tied to teaching practices, learning outcomes, and/or technology integration (Voogt & Roblin, 2010). Founded in 2002, the Partnership for 21st Century Skills (P21) brought together educational leaders, policymakers, and the business community to “kick-start a national conversation on the importance of twenty-first century skills for all students.” (Partnership for 21st Century Skills, 2014). With the intent of student preparedness in higher education, careers, and a globally competitive workforce, the developed P21 Framework integrated core subjects with twenty-first century skills focused on the identification of twenty-first century skills,

implementation issues, and considerations for assessment (Partnership for 21st Century Skills, 2014; Voogt & Roblin, 2010). P21 asserts that mastery of core subjects (English, reading, or language arts, world languages, arts, mathematics, economics, science, geography, history, government, and civics) is essential to student success (Partnership for 21st Century Skills, 2014). Table 4.1 outlines the P21 Framework as a suggested integrated model from the P21 organization of the skills, knowledge, and expertise students need to succeed in work and life (Partnership for 21st Century Skills, 2014).

Table 4.1
Partnership for 21st Century Skills Framework

21st Century Themes	Learning and Innovation Skills	Information, Media and Technology Skills	Life and Career Skills	21st Century Support Systems
Global Awareness	Creativity and Innovation	Information Literacy	Flexibility and Adaptability	Standards and Assessments
Financial, Economic, Business and Entrepreneurial Literacy	Critical Thinking and Problem Solving	Media Literacy	Initiative and Self-Direction	Curriculum and Instruction
Civic Literacy	Communication	Information, Communications and Technology Literacy	Social and Cross-Cultural Skills	Professional Development
Health Literacy	Collaboration		Productivity and Accountability	Learning Environments
Environmental Literacy			Leadership and Responsibility	

The P21 framework addresses technological skills, however the outlined competencies are not dependent on digital technologies. Therefore, for the scope of this research, this

framework was favored due to the focus on teaching and skills. The P21 framework is an integrated support system of teaching and learning, but focused research on what those systems look like in a contemporary classroom is scarce, especially in a Catholic educational environment (Tellez, 2013). This study attends to that gap in research, and highlights the incorporation of Bloom's revised taxonomy with twenty-first century learning goals to understand shifting teaching practices of Catholic middle level teachers in support of twenty-first century education.

Methodology

Context

This study emerged when two Catholic K-8 schools received funding for a three-year partnership with an educational institution that provided professional development, educational technology, and support for long-term planning. The three-year partnership was considered an educational technology initiative and for research purposes divided into two phases of study. Phase one introduced the basic concept of twenty-first century education and supported the development of teaching practices to support twenty-first student learning goals. This phase did not include the introduction of any new technologies. During phase two, schools and classrooms implemented new digital technologies that supported twenty-first century teaching practices and student learning. This study examines phase one of the initiative, specifically the understanding, development, and practice of twenty-first century teaching. The two schools entered the partnership at different times of the school year, therefore phase one is not necessarily the

traditional September to June time frame. Further explanation of time is included in the site descriptions.

Multiple-Case Study

Drawing primarily from Yin (2014) the use of case study was appropriate for this research for several reasons. First, the purpose of this study was to answer a set of *how* questions in order to understand shifting teaching practices of Catholic middle level teachers in support of twenty-first century education. Second, the goal was to investigate a contemporary issue in-depth and within its real-life context. Third, this inquiry aimed to understand teaching practices, and such an understanding incorporates important contextual conditions (Yin, 2014). Fourth, this study used multiple sources of data in order to triangulate the findings. Last, this study benefited from prior research on twenty-first century teaching and learning to guide the data analysis (Yin, 2014).

I used a multiple-case study design to examine several cases (teachers) to understand teaching practices of each individual teacher. An analysis of individual teachers provided in-depth description and understanding of teaching practices as they relate to twenty-first century education. I applied cross-case analysis among teacher comparison groups or teachers in similar contexts to deepen the understanding and explanation of teaching practices (Miles & Huberman, 1994).

Consistent with multiple-case study design, the time frame of the research was an important factor to consider. As Creswell (2013) suggested, deciding the boundary of time in case study research can be challenging. The beginning of this study was defined by the start of a three-year technology initiative. Data collection began prior to the

implementation of any new technologies (that resulted from the initiative) in order to extrapolate understandings of twenty-first century teaching and learning prior to the implementation of new digital tools and resources. Collecting and analyzing data on teachers’ teaching practices and opinions about contemporary teaching and learning *before* integrating new technologies attended to a gap in reviewed literature; specifically literature in Catholic education. However, in this study, there was no natural ending point (it was assumed that each teacher would continue to teach), thus stressing the need to set a time frame around each case. This study took place during the first phase of the initiative, which was not defined by a traditional school year. The first phase of the initiative, approximately one school year, was based on the agreed partnership timeline between the individual schools and the funding institution and further explained in site descriptions.

Site Selection

In order to determine teacher participants, I identified two schools based on (1) their Catholic education affiliation, and (2) their recent adoption of a technology initiative. Table 4.2 provides school level data for both school sites, followed by detailed descriptions of the schools.

Table 4.2
School Level Data

	Saint Martha’s	Saint Stephen’s
Building Configuration	Pre-K – 8th	Pre-K – 8th
Total Number of Students	259	219

% Free/Reduced Lunch	10.55%	17.26%
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Saint Martha’s. Saint Martha’s is an accredited, private Catholic school, sponsored by the Sisters of Mercy of the Americas Northeast Community. Embracing the values of Mercy education, Saint Martha’s opened its doors in 1963 to over 200 students in grades K-8. Saint Martha’s is committed to providing a quality, values-centered education in the Catholic tradition through an educational philosophy that prioritizes intellectual, spiritual, emotional, and physical growth of children. The school promotes six core values: (1) Compassion and Service, (2) Personal and Educational Excellence, (3) Concern for Human Dignity, (4) Global Vision and Responsibility, (5) Spiritual Growth and Development, and (6) Collaboration. In 2012 Saint Martha’s adopted a three-year strategic plan that particularly emphasized academic programs. The following year, October of 2013, Saint Martha’s entered into the agreed partnership with the educational institution. Phase one of this partnership lasted from October 2013 through November 2014.

Saint Stephen’s. Saint Stephen’s is an accredited, private Catholic Diocesan school situated in a suburban community in the Northeast. The core of Diocesan education is faith in every student, and recognition of dignity. Embracing the values of Catholic Diocesan education, part of Saint Stephen’s mission is to educate the whole person in light of the Catholic Faith, through educational programs that promote Christian values, academic excellence, and personal responsibility. In November of

2013, Saint Stephen's entered into the agreed partnership with the educational institution. Phase one of this partnership lasted from November 2013 through September 2014.

Participants

Within the specified schools, I used purposeful sampling and identified specific teachers as particularly rich cases to illuminate the research questions (Patton, 2002). I selected individual teachers based on whether or not they taught middle-level students, they were active participants in the partnership, and consented to ongoing research. Table 4.3 provides individual data for all cases. In this study, the participants are predominately White; therefore ethnicity was not reported so not to compromise confidentiality.

Table 4.3
Teacher Data

	Name	School	Content Area(s)	Gender	Age (Range)	Years Teaching (Range)
Case 1	Laura	Saint Martha's	Religion	F	>50	<5
Case 2	Elliot	Saint Martha's	Science	M	30-39	5-9
Case 3	John	Saint Martha's	Math	M	40-49	<5
Case 4	David	Saint Martha's	Social Studies	M	40-49	10-20
Case 5	Sharon	Saint Stephen's	Religion, Math, Social Studies	F	>50	>20
Case 6	Mary	Saint Stephen's	French, Religion	F	>50	>20
Case 7	Scott	Saint Stephen's	Religion, English	M	30-39	5-9

Case 8	Johanna	Saint Stephen's	Science	F	>50	5-9
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Data Collection

Consistent with multiple-case study design, data collection methods were applied over a bounded period of time (Creswell, 2013). Data sources throughout the first year of the initiative included semi-structured interviews, observations, and historical and field evidence, which provided additional background and information about each school and teacher, and provided essential contextual information (Marshall & Rossman, 2011; R. K. Yin, 2014).

Semi-Structured Interviews. Interviews allowed for detailed descriptions of the experiences and reflection on teaching practices of the participants (Crowe et al., 2011). Over the course of this study, I interviewed teachers first individually for approximately 60 minutes using a semi-structured interview protocol. Individual interviews were followed by focus group interviews with all participating teachers at each site. First, I constructed initial questions that addressed teachers' content knowledge, pedagogy, and technology use in the classroom partially adapted from Harris and Hoffer's (2011) Technology, Pedagogy, and Content Knowledge Interview Protocol. Second, I included questions that focused on teachers' understandings, beliefs, and opinions of twenty-first century education as they related to student outcomes. Last, I added questions that addressed teachers' backgrounds and values to focus on individual contexts. Focus group interviews followed the same protocol as the individual interviews with a primary

emphasis on specific classroom lessons. Individual interviews were digitally recorded, then transcribed, yielding 7 hours of audio and 91 pages of transcripts.

Observations. Observation played a critical role in data collection to better understand individual teaching practices. Observation provided deeper insight of teachers' teaching methods, and helped to "gain insider views and subjective data" (Creswell, 2013, p. 167). I was actively involved with each site from the onset of the initiative; therefore observations took two different forms. First, as a participant as observer (Creswell, 2013) I was an active contributor to teachers' lesson planning and classroom activities. In the nature of the partnership, I facilitated on-going teacher learning opportunities that included faculty professional development workshops, team or content level meetings, graduate level course work, and individual consultations. In these different capacities, I was involved with each teacher approximately four times per month for nine months during the first year. Second, as a nonparticipant observer, I conducted formal classroom observations and recorded data without direct involvement with teachers (Creswell, 2013). During formal observations, detailed notes included curriculum topics, student outcomes, instructional strategies, learning activities, technologies used, and environmental descriptions (e.g. classroom set up, number of students). I formally observed each teacher once in the first year of the initiative for approximately 50 minutes per observation, for a total of 400 observational minutes.

Historical and Field Evidence. Yin (2014) described historical and field evidence as collected data from the physical and social environment (of each case). Using historical and field evidence in qualitative research can help reduce the challenge

of reflexivity; that is, these data were created for reasons beyond the research inquiry thus not influenced by the study itself (Yin, 2014). Collected data related to each teacher produced a variety of verbal, written, and pictorial evidence. Historical documents and pictures included mission statements, school policies, strategic plans, teachers' curriculum scope and sequences, and school iconography. Field evidence included teacher reflections, teacher created photographs and videos of lessons, email correspondence, teacher blogs or websites, and informal teacher conversations.

Data Analysis

To answer the first research question, how do middle level Catholic school teachers interpret and apply twenty-first century teaching practices, I applied Yin's (2014) five-phased analytic cycle for data analysis. First, I compiled data (interviews, observation notes, and historical and field evidence) into chronological order per case. For historical and field evidence, I separated documents or evidence by case or context. For example, if evidence was directed related to a school, I included that evidence for each case from that school. Second, I disassembled data into smaller fragments representing each case. I reassembled data, the third phase, into codes and themes. I repeated the second and third phase several times for both individual and cross-case analysis. For individual, or with-in case, analysis I created a conceptually ordered display (Miles & Huberman, 1994) separated by cases, and clustered concepts drawn from the literature that related to the research questions. I used the P21 framework (Partnership for 21st Century Skills, 2014) as a primary coding structure for each case, followed by Bloom's revised taxonomy (Anderson & Krathwohl, 2001) as a second

coding framework (Table 4.4). For cross-case analysis I used a different conceptually ordered display but only included characteristics that appeared in multiple cases. From that, I created a case ordered display (Table 4.5) according to variables of interest to understand differences across cases (Miles & Huberman, 1994). I interpreted the data, the fourth phase, using the with-in, and cross-case, displays. In this phase, I focused on the second research question, how do contextual factors influence teachers' instructional practices as they align to twenty-first century educational goals? With data organized into case and cluster characteristics, I looked for emergent themes or categories related to contextual factors. That is, specific environmental, physical, or social considerations that may have influenced opinions or practice. Last, I drew conclusions from all data and represent those conclusions in key findings, limitations, implications for practice, and recommendations for future research.

Table 4.4
Conceptually Ordered Display for Individual Case Analysis (selected examples from interview data)

	Creativity	Critical Thinking	Communication	Collaboration
(Coded P21 Evidence with Bloom's Revised Taxonomy)				
Case 1 (Laura)	Interests; creation; do something about it. Where education is going.	Looking at different religions; inquiry learning/PBL religion unit	Interests drive learning community	Teacher is not the expert...learn from each other
Case 2 (Elliot)	Rap activity – demonstrate knowledge/learning of content	Role of a teacher: skepticism of information	Communication with community; authentic relationships with students	Goal of teaching: developing relationships
Case 3	Application to real life – bike activity	Development of student character –	Instructional communication	Peer-peer questions

(John)		application of that to math		
Case 4 (David)	PBL examples in lessons	Most important goal of teaching. Understanding application of learning style to life	Articulate ideas using written and oral expression	Group work in PBL
Case 5 (Sharon)	Examples of compassion – magazine collage	Meditation – evaluation of place in the world (Religion)	Circle of power and respect	Relationship building – education of the whole child
Case 6 (Mary)	Picture displays of story interpretation	Evaluation of content	Transmission of material in all aspects of life; do not use English in French (authenticity in communication)	Pen-pals
Case 7 (Scott)	Where does it fit with Religion? English: Storyboard	Student reflections on place and relationships	Teacher/student communication – role reversal?	Peer editing/feedback
Case 8 (Johanna)	Different data displays	Application of data to similar setting	Written documentation	Group lab work

Table 4.5
Case Ordered Display for Cross-Case Analysis (selected examples from observation data)

	Remembering	Understanding	Applying
Case 1 (Laura)	Researching facts	Describing meaning of facts	Understanding Peace conference
Case 2 (Elliot)	Vocabulary review; scientific process	Application of process to lab	Demonstration of understanding in an experiment
Case 3 (John)	Content development through lecture	Homework (room sketch activity)	Transformation of sketch to scale
Case 4 (David)	Direct instruction of facts	Individual explanations of facts	Combining facts to tell a story; applying process to other activities

Case 5 (Sharon)	Direct instruction of content	Problem practice	Homework/traditional assessment
Case 6 (Mary)	Vocabulary Review	Interpretation of vocab through pictures	Demonstration of understanding
Case 7 (Scott)	Writing process	Individual editing	Peer share/edit; applying process to other assignments
Case 8 (Johanna)	Description of data	Explanation of data displays	Using data to predict similar experiment

Trustworthiness

As earlier described, the partnership between the university and the schools provided teacher learning opportunities. Throughout the study, I maintained the dual role of researcher and the professional development provider. Understanding that this level of direct involvement with the sites and participants may yield research bias, in order to address the trustworthiness of this study I applied four primary validation strategies (Creswell, 2013). First, description provided details about the sites and participants that provided a deeper understanding of teaching practices (Shenton, 2004). Second, the triangulation of the data allowed for corroborating evidence from three sources; interviews, observations, and evidence; and provided validity to the findings (Miles & Huberman, 1994). Third, prolonged engagement and persistent observations of the teachers promoted trust with the participants and “informed decisions about what is salient to the study” (Creswell, p. 251). In the nature of qualitative research, it is nearly impossible to generalize results to a broader population (Shenton, 2004). Thus, fourth, to attend to the issue of transferability of the findings, I applied cross-case analysis that

might enhance generalizability or relevance of findings to similar settings (Miles & Huberman, 1994); perhaps other Catholic schools in comparable geographic locations undertaking similar initiatives.

Findings

The Partnership for 21st Century Skills (2014) framework provided the initial coding structure to answer the first research question. Broken down into four competencies, creativity, critical thinking, communication, and collaboration, I present findings within those themes. My secondary analysis focuses on the cognitive skills outlined in Bloom's revised taxonomy, remembering, understanding, applying, analyzing, evaluating, and creating. I also include evidence of such cognitive processes. In the cross-case comparisons, I highlight three dominant cognitive domains, remembering, understanding, and applying. Within both data schemes, data illuminated contextual factors that influenced teaching practices and I present those factors as the second research question.

How do middle level Catholic school teachers interpret and apply twenty-first century teaching practices?

Creativity. Evidence of teaching practices that supported student creativity opportunities were presented in two ways, thinking and practice. Laura described during one interview that she wanted her students to use their own ideas and interests to drive their learning; "if you're interested in something, and create something about it, I think that's really the giant step of where education is going." She encouraged them to think beyond the scope of the primary content area (Catholic religion), and explore how

different religions influenced opinions and actions. In practice, she took students on field trips and brought in guests to help inspire new ideas and diverse perspectives. In practice, as seen in observations, Laura fostered these connections through project-based assignments allowing students to demonstrate their own application of understanding. For example, some students used traditional sharing methods (e.g. posters, papers) while others used videos or audio recordings.

Mary emphasized student expression as a critical component of creativity. In her French class she did not want students to remember and recite vocabulary from texts; she provided opportunities for them to engage with the material in, as she described, “non-traditional ways.” One example of this was through art. She played a song for students (in French) and they drew what they heard. It was evident that not all students understood the song, but each one was able to describe the story that he/she heard. Mary described this process as a way for students to interpret ideas through creation. Where Mary felt she “lacked” in understanding twenty-first century education was how she could apply this type of learning to an assessment. In other words, she had difficulty reimagining tests and quizzes that would allow for more student creativity.

Scott taught both Religion and English, but focused most of his attention on twenty-first century skills in English. He questioned how teaching Religion could be creative; the material does not change, “what we teach comes right from the Catholic catechism.” In his English classes, however, Scott took a much different stance. He did not follow a scripted curriculum or resource and tried to bring in as many different forms of material as possible. He emphasized student creativity in the writing process; while

there was a linear procedure that he wanted students to know, he encouraged them to go through each step using their own methods of expression. For example, some students used collaborative digital tools to provide feedback and edit, while others students used different brainstorming techniques such as storyboarding. Scott highlighted the importance of learning outcomes, but how those outcomes are achieved can differ for each student.

Critical Thinking. “The most important role of a teacher,” stated David, “is to expose students to different things, and to help them develop critical thinking skills.” During each interview, everything David described in his teaching tied back to critical thinking. He grounded every activity and learning experience in the development of understanding and application. In practice, David was meticulously aware of students’ learning processes demonstrated through thoughtful inquiry questions. In a follow up interview, when prompted to expand on this observation, he emphasized that one of the primary skills he wanted students to walk away from his class with was an “understanding of their learning profile. I want them to gain the confidence they need as learners going forward.” David further explained that through activities such as dialogue and debate, students were able to develop deeper thinking skills that related to their learning profiles; particularly habits and skills that increased understanding and confidence.

One of John’s larger goals as a teacher was to take a “holistic approach - religious, spiritual, academic, personal, and Christian formation” to his teaching practice. He did not see his role as an educator as “just teaching a body of knowledge.” He wanted

to help students form “into people of character” and to do so felt that linking content to bigger components of life could help them develop into critical thinkers, a fundamental component to positive character development. His biggest challenge, highlighted in many conversations with John, was linking that goal to math. He focused on real life application; aspects of students’ lives that he could approach with mathematical concepts. For example, during an observation John brought in a mountain bike. Instead of directly explaining to students the connections between biking and math, he prompted them to discuss elements of biking, which resulted in students making connections between the content they were studying (ratios) and the gears on the bike. Similarly seen in other teachers, one challenge for John was to apply similar “real life application” reasoning and systems thinking skills to assessment.

Elliot described one of his roles as a science teacher as “helping students to understand.” He elaborated to state, “the one thing I want all of my students to leave here with is a strong skepticism about everything.” He further explained:

I think that there are so many things in the world just thrown around and become popular that have not been really thought about by almost anyone. I want my students to be skeptical about the world around them and slow down and think about things. I want them to be able to dissect ideas and processes and think about what they mean. Not just memorize them and move on. I want them to really be able to understand what concepts mean and how they are applied.

Elliot’s goal of facilitating skepticism strongly aligned to critical thinking and problem solving outlined in the P21 framework (Partnership for 21st Century Skills, 2014). His

description of wanting students to analyze and interpret information highlighted a primary goal of twenty-first century teaching (Voogt & Roblin, 2010). Though, in contrast, Elliot described his teaching (and was also observed) as providing students with the material through direct instruction. As he stated, “I outline ideas and distill from what I say are the important sentence or two.”

Communication and Collaboration. Although communication and collaboration often are separated into two skills or outcomes, data highlighted the connectedness of these competencies. This clearly manifested in Sharon’s description and observation of teaching. In Religion class, she described students engaging in a “circle of power that encourages respect, relationship building, and community.” Students often participated in individual prayer or meditation, and this was usually followed by group reflection and collaboration that included music and discussion. Community building was also evident in Elliot’s discussion on the purpose of education. He focused on communication and collaboration from the perspective of teacher-student relationship building. One of his goals as a teacher was to develop authentic relationships with students through effective communication and support.

Johanna emphasized communication and collaboration from a more content driven perspective. In observation she encouraged students to work together on science labs, make individual observations, and then articulate opinions or ideas through appropriate ways. For example, some students chose to dialogue while others opted for writing and reflection. Either way, Johanna was supportive of student choice and exercised flexibility as long as the learning outcomes were met. Mary also placed a high

priority on learning outcomes and communication and collaboration were two skills she stressed were critical in French. In her opinion, authentic learning in foreign language happened only when students spoke French. The rare occasion when I observed Mary needing to speak in English, she first asked students for permission. This level of modeling struck me as evidence to Mary's understanding that it is often necessary to make collaborative compromises to achieve a learning goal.

Connection to Bloom's Taxonomy. Looking across cases, the majority of emphasized cognitive processes supported lower order thinking skills, such as remembering, understanding, and applying (Anderson & Krathwohl, 2001). This was especially evident in observations. Although some participants stressed a desire to facilitate activities that encouraged analyzing and evaluating, teaching practices did not corroborate this aspiration. As earlier noted, for example, Elliot wanted his students to "dissect ideas and processes...not just memorize them and move on," but his actions of presenting only material he felt important did not support this want. Laura was the one teacher who did promote higher order thinking skills in her teaching. She facilitated activities that supported students evaluating different religions and comparing and contrasting those religions with their beliefs. Yet, this was the exception. In distinct contrast in a different religion class, Scott did not see how he could encourage student evaluation of prescribed content.

Observation data revealed that most participants encouraged creativity. However, many of the opportunities prompting students to demonstrate the higher cognitive process of creating were still prescribed by the teacher. For example, David used a local popular

newscast as a model for students to present material or facts from a different year and location. Although this activity yielded the opportunity for students to be creative with their presentations, the expectation of each student (or group of students) was the same. In reflection, David recognized that he could have given them more freedom with expression or choice of presenting tool, but those ideas “don’t come naturally to me. It isn’t until we reflect on them that I think ‘that would have been a great idea’.”

How do contextual factors influence teachers’ instructional practices as they align to twenty-first century educational goals?

In order to answer the second research question, I analyzed sorted data for similarities and differences between cases. Data illuminated three recurring themes that highlighted those similarities and differences, teacher background, content area, and environment.

Background. Interview data yielded valuable insights on teachers’ backgrounds and interpretations or practice of twenty-first century teaching. Laura, who comparatively demonstrated the most innovation with teaching, expressed a “calling to teach.” She explained that she enjoyed guiding people to whole person development through inquiry and reflection. Additionally, she held a degree in mass communication. These two background characteristics visibly influenced her teaching. Laura encouraged consistent student reflection and her classroom was a community of welcomed communication and collaboration. Although she did not follow what might be described as a traditional teaching path, her unique experiences served as a model for her understanding educational goals and outcomes.

David and Elliot both described “teacher inspiration” as the initial reason they were attracted to education. They were motivated by former teachers, and “wanted to teach like them.” Additionally, in their early experiences as educators they quickly realized specific elements of education that were (or were not) a good fit. David started teaching at the elementary level and “that age...not for me.” After changing roles to become an Assistant Principal, then Principal, David quickly realized that it was the mentoring of teachers that he enjoyed most about his job; also an aspect that he most respected about his former teachers. He left administration to take a middle level teaching position and “loves that the most.” When observed, David clearly applied the mentoring style he referenced. Students gravitated toward this type of teaching and relationship building, as they were often seen staying late after class to simply talk about sports, current events, or music.

Content. John’s background was in science, but when there was an opportunity to teach math at St. Martha’s he immediately wanted the position. He explained,

To teach science took a huge amount of physical involvement - always off going to beaches, shuffling sand, doing models of all this stuff... but teaching math I felt like it was more of an intellectual and organizational challenge to think through how to build a math foundation opposed to wowing them everyday. I still want a wow factor but it is stronger in science.

This particular opinion of mathematical content manifested itself in observation data.

Content was presented through teacher direct instruction and student note taking.

Although John often encouraged real world connection and understanding with material, he presented these opportunities after students acquired the foundational knowledge.

Johanna and Mary shared similar beliefs about content and teaching. In both science and French, there was an element of foundational knowledge necessary to “move to the next level.” On different occasions, they both described specific skills students needed before they could move on to the next concept. Johanna was driven by “preparation for high school.” She had specific goals for students when they graduated. Mary, however, simply wanted students to be able to speak in French. “I don’t have to prepare them for the next step,” explained Mary. It was to her own standards she held herself accountable. Either way, both teachers had reservations about the push for twenty-first century learning and how more inquiry oriented or reflective environments would play against the “pressures of time.”

Environment. Differences in participants’ physical teaching environments influenced teaching practices. Sharon’s interpretation and practice of teaching were evident in her classroom set up. The desks in Sharon’s classroom were organized in groups. This arrangement supported the communication and collaboration previously described. She wanted students to learn with and from each other. This differed from Elliot’s room; he had desks in rows all facing the board. Elliot liked “the traditional” classroom, even though he recognized that it “goes against what most other teachers are doing.” When I asked him a follow up question of why, he stated, “I just feel more comfortable teaching that way.” Elliot’s set up supported his method of direct

instruction, but the separated desks did call into question his goal of relationship and community building.

Although this study focused on individual teachers as cases, data illuminated environmental differences at the school level as reasons for varying interpretations of twenty-first century teaching. For example, Scott felt pressured from his school to teach Religion curriculum directly from the Catholic catechism. Laura, on the other hand, recognized that she had a lot of freedom with content. Although both schools were Catholic, small differences in their respective mission statements were perhaps reasons for the teaching dissimilarities. St. Stephen's emphasized leading students to authentic relationships with Jesus Christ, while St. Mary's was "committed to providing a quality, values-centered education in the Catholic tradition that prepares students for the complexities of our diverse world."

Discussion and Conclusions

The findings in this study accentuated creativity, critical thinking, communication, and collaboration as participants' goals. However, data illuminated that within practice in the majority of the cases those goals were being met utilizing lower order cognitive processes, not higher order skills as presented in Bloom's revised taxonomy (Anderson & Krathwohl, 2001). As new technologies allow for instant access to information and knowledge, the model of teachers as content experts in the front of the classroom is outdated (Gunn & Hollingsworth, 2013). Many researchers and practitioners support more challenging and active learning experiences, where students and teachers collaborate together employing higher order thinking skills (Fullan &

Langworthy, 2014; Johnson et al., 2014). Data illuminated two areas where there was a noteworthy lack of understanding as they relate to twenty-first century learning.

Assessment

A critical component of this shortcoming was the lack of innovation and creativity with assessments. While most participants recognized and embraced a change in teaching practice, the component of assessment was unaltered. While student involvement is often promoted as a necessary component of twenty-century education (Fullan & Langworthy, 2014; Voogt, 2008), applying a student driven, inquiry oriented approach to assessment was rarely mentioned and never observed.

I was surprised by the absence of rethinking assessments particularly with David's case. His primary goals as a teacher were help students develop critical thinking skills and understand their learning profile. Assessment is an essential component in understanding personal learning, yet he used the same assessment for all students. In this regard, David assessed specific content knowledge opposed to personal learning progress. In moving forward with developing twenty-first century practices, I would encourage him to focus on the higher order thinking skills as suggested in Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001) and consider how students could utilize those processes through varied or personalized assessments based on their individual learning profiles.

The Role of Technology

An unexpected concern that developed was the frequency of the phrase, "when we get more technology, I will be able to..." These statements often ended with, for example, "change my teaching style; differentiate more; or provide more authentic

learning experiences.” These statements prompted the question; does technology drive the teaching? Early studies on technology integration included an increased use of an inquiry approach, interdisciplinary activities, differentiated instruction, collaborative learning opportunities, and shifting teaching methods (Fairman, 2004; Shapley et al., 2009; Silvernail, Pinkham, Wintle, Walker, & Bartlett, 2011). But while an inquiry-oriented approach to education is one method of teaching that fosters authentic learning and understanding (B. Y. White & Fredericksen, 1998), the philosophy of constructivist teaching is certainly not as new to education as technology integration (Rakes, Fields, & Cox, 2006). Underlying principles from leading educational theorists such as Dewey, Piaget, and Vygotsky (Becker & Ravitz, 1999) emphasized integrated, active curriculum based on students’ interests in real-life environments (Dewey, 1916). Vygotsky (1978) and Piaget (1973) endorsed similar thinking; learning and understanding should be based on discovery and involvement in relevant circumstances. Vygotsky encouraged knowledge construction in children through the linking of ideas and concepts from interaction, and Piaget challenged the traditional school of the twentieth century and suggested that “a student who achieves a certain knowledge through free investigation and spontaneous effort will later be able to retain it” (p. 93). Yet the lack of digital resources was often used as an excuse for not promoting these types of environments. In the majority of the reviewed literature on Catholic education in the twenty-first century, priority was given to innovation, not digital technologies (Kennedy, 2013; Nuzzi et al., 2012; O’Keefe & Goldschmidt, 2014). However, the teachers in this study demonstrated

opposite opinions; technology was the priority and until new resources became available, changing teaching practices could wait.

In one case, Laura understood this primary issue as she encouraged students to develop their own opinions about content and apply those opinions to deeper thinking about relationships between other religions and the place, role, and influence of Catholicism. She moved around the classroom engaging in conversations with groups of students modeling the role of facilitator, not traditional front of the room teacher. This type of practice highlighted the modern role of teaching and learning. It is no longer enough to memorize facts; teachers need to help students gain an understanding of what to do with facts. As Elliot described, there is so much information “out there”, students need to critically analyze, interpret, and apply knowledge. Nonetheless, Laura was the exception. Although many participants communicated the desire for similar classroom environments, in practice they did not present transformational teaching styles.

Recommendations for Future Research

Limitations of this study advanced the recommendations for future research. First, this research was conducted in two small Catholic schools in a Northeastern state. Although cross-case analysis has the potential to enhance generalizability to similar settings (Miles & Huberman, 1994), in the nature of qualitative research, findings should not be generalized to a larger population. Therefore, research in additional Catholic school settings will contribute more, and perhaps different, perspectives on twenty-first century teaching. Second, also due to the geographic location of the schools, racial diversity is not well represented in this study. Similarly, additional research in different

Catholic schools with a more diverse population might provide varied opinions and evidence of practice. Third, data were only collected from teachers. To provide a more detailed description of the context of Catholic education, future research should include leadership structures, students, and parents to provide a broader view of the school community. Last, this study was the first phase of a longer research project. As evidenced by teacher statements, implications of increased technology might influence educational practices. Therefore, conclusions should be taken into context within the time frame of the study. Future research with the same population, however, is warranted to understand if indeed technology may influence teaching and learning.

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CHAPTER FIVE

Scholarly Article 2

The Influence of Technology Integration on Middle Level Catholic Teachers'

Instructional Practices

Introduction

The dynamic landscape of the twenty-first century necessitates rethinking the structures and purposes of education. Economic development and social change requires participation in jobs within a world that is flexible and unpredictable (Dede, 2010a; Schleicher, n.d.), and educators are tasked with the unprecedented demands of preparing students for challenges that have yet to exist. Teachers' purpose and roles are shifting; traditional models of content delivery and mastery are not sufficient for the new emphasis on challenge-based, active, collaborative, and student-driven learning environments (Fullan & Langworthy, 2014; Johnson et al., 2014). With technology as a driving force in societal change, school and classroom-based technology initiatives or integration plans are becoming normal practice (Daniels et al., 2014; Drayton et al., 2010), with teacher and student access to portable devices doubling over the past two years (Speak Up, 2013).

Early research on the adoption and use of educational technology indicated positive teaching and learning experiences (e.g. Argueta, Huff, Tingen, & Corn, 2011; Barrios et al., 2004; Penuel, 2006). However, current long-term studies are either limited (Zheng & Warschauer, 2013), or have given prominence to the technological tool opposed to teaching (Drayton et al., 2010; Weston & Bain, 2010b). Although technology

initiatives are common in both public and private schools (Bebell & Kay, 2010), the majority of research on the use and influence of technology is situated in public school classrooms (Galla, 2010; Gibbs et al., 2008; Tellez, 2013), leaving out a sizable population in the private school sector.

Approximately 5.5 million K-12 students are enrolled in private school and, of that, 2.2 million are enrolled in Catholic schools (“Catholic School Data,” 2013, “K-12 Facts,” 2014), making up approximately four percent of the total (public and private) K-12 enrollment. Although Catholic schools are the largest academic branch of private religious education, demographic shifts and changing economies have led to a steady enrollment decline (Nuzzi et al., 2014). Many families seek out an alternative to private secular education (Hunt & Carper, 2012), and Catholic schools offer a demonstrated commitment to character and community involvement, faith, and academic success (Kennedy, 2013; Nuzzi et al., 2012). However, despite the successes demonstrated throughout the history of Catholic school education and the acknowledgement of declining enrollment, there are few advocates at the national, or even state, educational policy levels interested in preserving the structures of K-12 Catholic education, and building a comprehensive vision for the sustainability of Catholic schools (Nuzzi et al., 2012). To help achieve comprehensive goals and priorities for Catholic education in the twenty-first century, increased focused research on the educational opportunities within Catholic schools becomes a priority. Understanding local strategic plans to endorse Catholic education provides a platform for moving the conversation to the national level.

In response to shifting twenty-first century teaching and learning goals, and to remain relevant and competitive in the private school market, Catholic educational leaders, teachers, and researchers recently have endorsed updated and innovative teaching practices (Kennedy, 2013), broader approaches to teaching the whole student (O’Keefe & Goldschmidt, 2014), and stronger collaborative communities of learning (Zukowski, 2012). Integrating digital tools and resources provides opportunities to meet such objectives, but focused research on Catholic school teaching in a digital age is limited (Cho & Littenberg-Tobias, 2014; Tellez, 2013; Zukowski, 2012). Accordingly, I posed two research questions: (1) How are Catholic educators integrating technology in their teaching? And (2) how does the use of technology influence teachers’ instructional practices?

Theoretical Framework

The context of this research was within Catholic education, but to understand the influence of technology on teaching practices a broader perspective of technology in education framed the study. To that end, three current models of understanding technology integration served as the basis for this inquiry.

Technological, Pedagogical, and Content Knowledge (TPACK)

Shulman (1986) redefined thinking about the knowledge teachers need for teaching with his intersecting construct of pedagogical knowledge and content knowledge (PCK). As technology was recognized as an invaluable tool for learning, the evolution of PCK moved to integrate technological knowledge in a similar way (Niess, 2011). To

address teacher preparation in the use of technology, Mishra and Koehler's (2006) Technological, Pedagogical, and Content Knowledge (TPACK) framework provided a structure that described the relationships between technological, pedagogical, and content knowledge. Drawing on Shulman's PCK framework, TPACK introduced seven knowledge domains needed for effective teaching (Mishra & Koehler, 2006); (1) Technological Knowledge (TK), (2) Pedagogical Knowledge (PK), (3) Content Knowledge (CK), (4) Technological Pedagogical Knowledge (TPK), (5) Pedagogical Content Knowledge (PCK), (6) Technological Content Knowledge, and (7) Technological Pedagogical Content Knowledge (TPACK) (See Figure 5.1).

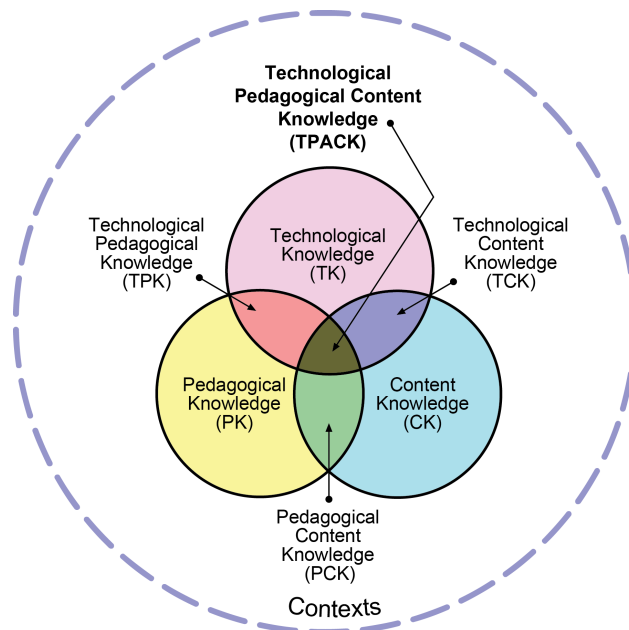


Figure 5.1: The TPACK Framework. Reproduced by permission of the publisher, ©2012 by tpack.org

TPACK prevails as the most common framework in conceptualizing teachers' current utilization of technology in education (Koehler, Mishra, Kereluik, Shin, & Graham, 2014). It has been used to assess teacher knowledge as it related to technology

integration (Koehler & Mishra, 2009; Niess, 2011), employed as a framework for professional development programs (Harris & Hofer, 2011; Harris et al., 2009), and applied as an analysis structure for technology use (Alayyar et al., 2012; Archambault & Crippen, 2009; Chai et al., 2011; Dawson et al., 2013). Two particular limitations of TPACK research include the understanding of TPACK in different disciplines and the relationship between TPACK and broader twenty-first century educational goals (Koehler et al., 2014). To address those limitations, I first looked at TPACK across multiple content areas to highlight the instances teachers were integrating technology in their practice, and applied the Substitution, Augmentation, Modification, Redefinition (SAMR) model as a framework to further describe the teaching and learning experiences. I then used the International Society for Technology in Education teaching standards to further understanding the implications of technology integration aligned to twenty-first century educational goals.

Substitution, Augmentation, Modification, Redefinition (SAMR)

Puentedura's (2006; 2010) Substitution, Augmentation, Modification, and Redefinition (SAMR) model aims to support educators through the integration of technology to transform teaching and learning experiences. The model highlights four levels of technology integration moving from the enhancement of teaching and learning (Substitution and Augmentation) to the transformation of teaching and learning (Modification and Redefinition). At the enhancement level the implementation of technology replaces non-digital tools with little changed functionality, contrasting with transformation that enables teachers and students to complete tasks not possible without

technology. Table 5.1 summarizes Puentedura’s SAMR model with descriptions, and a practical educational application of the model.

Table 5.1
SAMR Model (Adapted from Puentedura, 2010)

Level		Definition	Description
Redefinition	<i>Transformation</i>	Tech allows for the creation of new tasks, previously inconceivable	Students use digital tools to interview author, collaborate with peers in different states/countries, or use digital mapping software to follow the storyline
Modification	<i>Transformation</i>	Tech allows for significant task redesign	Students use additional digital tools to summarize or synthesize understanding; for example, record a podcast or create a graphic visualization
Augmentation	<i>Enhancement</i>	Tech acts as a direct tool substitute, with functional improvement	Students use built in digital tools to enhance reading; for example a highlighter or dictionary
Substitution	<i>Enhancement</i>	Tech acts as a direct tool substitute, with no functional change	Students read a book using a digital reader

Although the SAMR model provides educators with a framework for technology implementation, in a tablet PC initiative van Oostveen, Muirhead, and Goodman (2011) found little teaching evidence at the transformation level (Modification and Redefinition). Furthermore, despite the use of technology, they reported no change in student learning experiences. Schugar and Schugar (2014) illustrated the differences between

enhancement (Substitution and Augmentation) and transformation (Modification and Redefinition) with the implementation of interactive eBooks for classroom instructional and assessment purposes. They revealed two different uses of eBooks; the first replaced traditional books shifting the reading experience from paper based to digital text, and the second transformed the experience by adding interactive, multi-touch books (Schugar & Schugar, 2014). They contended that the application of the SAMR model has the potential to help teachers understand how implementing technology changes the learning experiences of students (Schugar & Schugar, 2014).

International Society for Technology in Education Standards for Teachers

The International Society for Technology in Education (ISTE) aims to empower learners and improve teaching and learning in a connected world (“ISTE Standards for Teachers,” 2014). The ISTE Standards for Teachers (Standards•T), formally known as the National Educational Technology Standards for Teachers (NETS), evaluate “the skills and knowledge educators need to teach, work and learn in an increasingly connected global and digital society” (“ISTE Standards for Teachers,” 2014). The ISTE Standards•T follow the previously developed ISTE Standards for Students (Standards•S) situated in the context of twenty-first century learning, and provide a framework for educators to shift and align teaching practices with desired twenty-first century student outcomes. In addition to contributing a teaching perspective to twenty-first century education, the ISTE Standards•T, as summarized in Table 5.2, emphasize technology in teacher practice (Parker et al., 2009).

Table 5.2
ISTE Standards•T

Standard	Description	Practice (selected examples)
Facilitate and inspire student learning and creativity	Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity and innovation in both face-to-face and virtual environments	Engage students in exploring real-world issues and solving authentic problems using digital tools and resources
Design and develop digital age learning experiences and assessments	Teachers design, develop, and evaluate learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the Standards•S	Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity
Model digital age work and learning	Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society	Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations
Promote and model digital citizenship and responsibility	Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices	Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources
Engage in professional growth and leadership	Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources	Participate in local and global learning communities to explore creative applications of technology to improve student learning

The ISTE Standards•T provide a framework for educators to develop necessary twenty-first century teaching skills. The suggested methods of teacher practice within each standard (“ISTE Standards for Teachers,” 2014) are a critical component of the Standards•T. Although the ISTE standards are widely adopted across teacher learning and technology professional development programs (Haynes et al., 2014; Morris, 2013), there is limited research on the relationships between the standards and teachers’ classroom practice (Sam, 2011). Furthermore, research that was conducted found little or no influence, knowledge, or understanding of the implications of the ISTE standards on developing teacher practice in a digital age (Caglar, 2012; Sam, 2011). Therefore, I chose to apply the ISTE standards as a framework and coding analysis to further understand the use of technology in teaching based on accepted digital age educational standards, and attend to a gap in research based awareness of the ISTE standards.

Methodology

This study emerged when two Catholic K-8 schools received funding for a three-year partnership with local university that provided professional development, educational technology, and long-term planning. For research purposes, the three-year partnership was divided into two phases of study. Phase one consisted of introducing twenty-first century education concepts and developing teaching practices to support contemporary student learning goals. This phase did not include the introduction of new technologies. Phase two represented the implementation of new digital technologies in each school and classroom that supported middle level teaching practices and student

learning. This inquiry represents phase two of the initiative, specifically focusing on teaching practices after implementing new technologies.

Multiple-Case Study

The use of case study was appropriate for this research as I sought to answer a series of *how* questions as they related to teaching practices (Yin, 2014). I applied a multiple-case study approach to understand instructional practices of individual teachers (Yin, 2014). An initial analysis of each case provided in-depth illustrations of integrating technology in teaching. This was followed by cross-case analyses among teachers to deepen the understanding and explanation of any relationships between teaching practices and contemporary educational technology outcomes (Miles & Huberman, 1994). The time frame of the research was a important factor; the beginning of this study was defined by the implementation of any new digital technologies provided by the three year partnership.

Site Selection

In order to determine teacher participants, I first identified two schools based on their Catholic affiliation and their recent implementation of this technology initiative. Table 5.3 provides school level data for both school sites and is followed by detailed descriptions of the schools.

Table 5.3
School Level Data

	Saint Martha's	Saint Stephen's
Building Configuration	Pre-K – 8th	Pre-K – 8th

Total Number of Students	259	219
% Free/Reduced Lunch	10.55%	17.26%

Saint Martha’s. Saint Martha’s is an accredited, private K-8 Catholic school, sponsored by the Sisters of Mercy of the Americas Northeast Community, situated in a suburban community in the Northeast. Its educational philosophy prioritizes intellectual, spiritual, emotional, and physical growth of children, through six core values; (1) Compassion and Service, (2) Personal and Educational Excellence, (3) Concern for Human Dignity, (4) Global Vision and Responsibility, (5) Spiritual Growth and Development, and (6) Collaboration. In 2012 Saint Martha’s adopted a three-year strategic plan that particularly emphasized academic programs, and the following year partnered with the aforementioned university. At the start of this study, Saint Martha’s teachers and students had access to classroom interactive white boards, a shared classroom cart of laptops, and a shared computer lab with desktops. New technologies introduced included individual teacher tablets, individual teacher laptops, and a shared cart of student tablets.

Saint Stephen’s. Saint Stephen’s is an accredited, private Catholic Diocesan school situated in a suburban community in the Northeast. Embracing the values of Catholic Diocesan education, the educational programs of Saint Stephen’s promote Christian values, academic excellence, and personal responsibility. In November of 2013, Saint Stephen’s entered into the agreed partnership with the aforementioned university. At the start of this study, Saint Stephen’s teachers had access to a shared

computer lab with desktop computers. Saint Stephen's decided to implement a middle school (6-8) one-to-one (1:1) initiative, and new technologies introduced included individual teacher laptops, classroom TVs, and individual teacher and student tablets.

Participants

Within the two schools, I used purposeful sampling and identified specific teachers as particularly rich cases to illuminate the research questions (Patton, 2002). I selected individual teachers based on whether or not they taught middle-level students, they were active participants in the partnership, and consented to ongoing research.

Table 5.4 provides individual data for all cases. In this study, the participants are predominately White; ethnicity was not reported so as not to compromise confidentiality.

Table 5.4
Teacher Data

	Name	School	Content Area(s)	Gender	Age (Range)	Years Teaching (Range)
Case 1	John	Saint Martha's	Math	M	40-49	<5
Case 2	Elliot	Saint Martha's	Science	M	30-39	5-9
Case 3	Johanna	Saint Stephen's	Science, Math	F	>50	5-9
Case 4	Sharon	Saint Stephen's	Religion, English	F	>50	>20
Case 5	Laura	Saint Martha's	Religion	F	>50	<5
Case 6	Mary	Saint Stephen's	French, Religion	F	>50	>20

Data Collection

For the purpose of this study, data collection started immediately at the onset of the implementation of any new digital technologies. For teachers at both Saint Martha's and Saint Stephen's, data were collected from January of SY13/14 through November of SY14/15. It should be noted that the data collection period did not reflect the entire time span of the partnership or technology initiative. Consistent with qualitative case study, I used multiple primary methods for gathering information (Marshall & Rossman, 2011). I conducted individual and focus group interviews, I participated and observed directly, and I administered a survey.

Interviews. I used a semi-structured interview protocol to interview individual teachers for approximately 60 minutes once in the Spring of SY13/14 and again in the Fall of SY14/15. I adapted the interview protocol from Harris and Hoffer's (2011) Technology, Pedagogy, and Content Knowledge Interview Protocol. Questions primarily focused on teachers' classroom use of technology, opinions on benefits and challenges, and perceived impact on student learning. I added questions that addressed teachers' backgrounds, personal technology use, and educational and school values. Individual interviews were digitally recorded and transcribed, yielding 14 hours of audio and 182 pages of transcripts.

In addition to individual semi-structured interviews, I conducted ongoing informal, conversational, and focus group interviews. As described by Marshall and

Rossman (2011), these interviews allowed for conversations that highlighted teachers' classroom technology use. I explored general topics that illustrated teachers' perspectives opposed to framing questions based on my views (Marshall & Rossman, 2011).

Observations. I was actively involved with each site from the onset of the initiative; therefore observations took two different forms. First, as a participant as observer (Creswell, 2013) I was an active contributor to teachers' lesson planning and classroom activities. In the nature of the partnership, I facilitated on-going teacher learning opportunities that included faculty professional development workshops, team or content level meetings, graduate level course work, and individual consultations. At this level during the time period of this study, I was involved with each teacher approximately four times per month for seven school months. I observed teachers both face-to-face and virtually. As a nonparticipant observer, I conducted formal classroom observations and recorded data without direct involvement with teachers or students (Creswell, 2013). During formal observations, detailed notes included curriculum topics, student outcomes (as described by the teacher), instructional strategies, learning activities, technologies used, and environmental descriptions (e.g. classroom set up, number of students). I formally observed each teacher twice for approximately 50 minutes per observation, for a total of 600 observational minutes.

Survey. Due to my ongoing relationships with the participants, I used a survey as a teacher reported data source to either support or contradict interpretive qualitative findings. Teachers responded to a 37-item survey instrument, the Levels of Teaching

Innovation (LoTi) Digital-Age Survey (“LoTi,” 2011). Teachers currently take the LoTi Digital-Age Survey every school year; for this study I used data from the Fall SY14/15 administered survey. The LoTi Digital-Age Survey is aligned to the ISTE Standards•T (Moersch, 2011), and thus provided an essential framework for a further understanding of teaching practices in a digital age. The LoTi Digital-Age Survey is a validated instrument for the evaluation of teacher practice (Stoltzfus, 2009), and measured the levels of teaching innovation (LoTi), personal computer use (PCU), and current instructional practices (CIP) of the participants. The first part of the survey asked participants a series of demographic questions that provided general demographic data for the population. The second part of survey included 37 questions related to technology use and teaching practices. Each question offered eight responses on a scale of 0 to 7: 0 (Never), 1 (At least once a year), 2 (At least once a semester), 3 (At least once a month), 4 (A few times a month), 5 (At least once a week), 6 (A few times a week), and 7 (Daily). This scale was used for all questions to determine the results for the LoTi (instruction, assessment, and the effective use of digital tools in the classroom), PCU (personal fluency with digital tools and resources), and CIP (instructional practices related to a learner-based classroom approach) scores, as further outlined in the Appendix.

Data Analysis

To answer the proposed research questions, I followed a qualitative analytic procedure of organizing the data, immersion in the data, generating categories and themes, coding the data, searching for alternative understandings, and reporting (Marshall & Rossman, 2011). I used interview, observation, and survey data for individual, or

within, case analysis to answer the first research question represented through a case ordered matrix display (Miles & Huberman, 1994). First I coded the interview and observation data of each case, examining instances of teachers demonstrating the integration of technology, pedagogy, and content as described by the TPACK framework (Koehler et al., 2014; Mishra & Koehler, 2006). From those instances, I recoded the data using the SAMR model as a framework (Puentedura, 2006). I applied the survey data (specifically the PCU score) to further understand the context of each case, and interpreted and compared scores to the other sources of data. I used interview, observation, and survey data for cross-case analysis to answer the second research question by applying Yin's (2009) case-oriented approach. By utilizing the ISTE Standards•T to study one case in depth, I looked for similar or contrasting patterns in successive cases. Then I used survey data (specifically the LoTi scores) to enhance descriptions and triangulate findings. Survey data also complemented emergent patterns in understanding teachers' instructional practices (the CIP score) utilizing technology.

Findings

The Technological, Pedagogical, and Content Knowledge (TPACK), and Substitution, Augmentation, Modification, and Redefinition (SAMR) frameworks provided coding structures to answer the first research question; how are Catholic educators integrating technology in their teaching? I used an individual case analysis process (Miles & Huberman, 1994) to highlight the instances teachers were integrating technology in their practice, followed by a description (based on the SAMR model) of the level of technology integration. I then used the ISTE Standards for Teachers

(Standards•T) and cross-case analysis to explore the second research question; how does the use of technology influence teachers' instructional practices?

How are Catholic educators integrating technology in their teaching?

To explore the first research inquiry, I provide a brief background of each participant followed by a description of how they are using technology in their practice.

Case 1: John. John is in his second year of teaching math at Saint Martha's, and expressed that he "stumbled into teaching." Although he did not go through a traditional teacher preparation program, he spent a semester student teaching and "it just grabbed me...loved everything about it – love of material, love of kids." His content background was primarily in science, but there was an opportunity to teach math at Saint Martha's and he welcomed the "intellectual and organizational challenge" of teaching math.

According to John, teaching math means building a foundation opposed to "wowing them everyday." In terms of personal technology use, John is a "self proclaimed Luddite." He expanded,

I don't really like using technology, I don't like to be on it, I really use technology as little as possible. I don't search the web – ever. I would rather grab an encyclopedia. I don't enjoy it. I don't use it in any way shape or form for fun.

John expressed a clear dislike of technology, but he insisted that students needed to "learn it and with it." However, John's Personal Computer Use (PCU) survey score corresponded more to his description of personal use of technology. With a score of one, John had little fluency with using digital tools in student learning ("LoTi," 2011). In interviews, when John most often spoke about integrating technology in his teaching he

referred to using tablets as an opportunity for differentiated instruction. Observation supported this; John used different math applications (apps) for students depending on their skill or comprehension levels. When he found an app that replicated hands on learning for algebraic equations, he grappled with the decision to use technology or use hands on manipulative materials. “Because of the tech factor for the students, every Friday we use the app.” He tied this back to differentiation in that some students pick up concepts faster than others, “you can send kids by themselves and it is sort of a tutorial...I’ve used it in that way. [The app] has helped me in being an extra teacher if you will.”

John’s classroom technology use highlighted the enhancement of instruction through the direct substitution of a digital tool with no real functional change. His indecisiveness on whether or not to even use the app suggested that, with or without technology, learning outcomes would be the same. His final decision to use the app was based on the “tech factor” opposed to any change in student learning or experience. However, he pointed to his ability to allow students to work at their own pace, indicating an augmentation of his instruction; there was functional improvement with his teaching - he was, as described, able to be an extra teacher.

Case 2: Elliot. Elliot described his love of science and his admiration for his science teachers as motivation for becoming a science teacher himself. “I got lost in and loved science. I had charismatic and intelligent teachers. As a student those were my role models. I wanted to be like that. Since middle school, I have known that I wanted to teach science.” Elliot described his relationship with technology as a “double edged

sword.” He thinks it is “neat” and regularly uses a smart phone, computer, and tablet, but expressed concern “with every minute I spend on a device, I’m not interacting with people in real life.” While he likes technology, he questioned the authenticity of individual use or experiences using a digital device.

Elliot described using technology as a teaching tool for direct instruction; he used digital presentations to outline ideas during lectures. During the first observation of Elliot teaching, I observed exactly that. As opposed to writing notes on a board, the notes were prewritten in a digital presentation (i.e. PowerPoint), and students copied them from the slides. Elliot did not read directly from the slides; they contained what he felt was the most important information “distilled from everything said.” In this method of instruction, Elliot’s PCU score of five closely aligned to what I observed. He demonstrated a high fluency level with using digital tools and resources for student learning (“LoTi,” 2011), as they were appropriate for direct instruction.

The addition of tablets for teaching and learning did not change Elliot’s teaching style or opinions of technology with the exception of, as he described, the ease of use for simulations. Circuits, Elliot described, “are a pain in the neck for hands on.” He explained that they can be expensive, and materials often break. Using tablets (or computers) for simulations can make exploring and manipulating circuits more assessable and understandable. Additionally, they (tablets) can make other experiences or experiments safer. In my first analysis of this description, I considered Elliot’s use of technology as enhancement. The tablet was a direct tool substitution with minimal functional improvement. However, when he expanded his illustration of simulations, and

during one of the observations, I acknowledged a significant redesign in teaching and student experience. In a genetics unit, students were able to do “hybridizations and cross breeding,” a task not possible without technology.

Case 3: Johanna. Johanna is a self-proclaimed teacher at the heart. Ten years ago she was an analyst at a local technology company and developed models used to simulate computer chips. When an opportunity arose at Saint Stephen’s to teach math and science, she took a leave of absence from her job and filled the position. After two years, “she was hooked,” quit her job, and “hasn’t looked back.” She teaches all of the middle level science classes, and the 8th grade algebra class. Johanna admitted that her love of technology “drives my husband crazy.” She referred to herself as a “gadget geek” who goes to bed with her phone by her side and grapples with the nightly decision of “do I also bring my iPad? Kindle? Laptop?”

Her personal love of technology aligned with her opinions of technology in the science classroom. This contrasted with math where Johanna felt a need to prepare students for a high school honors track. “I have so much to get through; I am very much setting a foundation. I don’t do anybody any favors if we only get half-way through the book.” She described her mathematics instruction as very traditional – lecture, pencil, and paper. However, in science, she considered technology as a teaching and learning motivator; it allowed for increased access, exposure, and engagement. “That said,” stated Johanna, “I also believe in balance. Tech is about engagement; if I’m bored with something the kids are definitely bored.” Balance was a common theme in all of Johanna’s interviews, as well as science class observations. There were elements of

technology integration in every class, but if something was not working, either technically or in terms of learning outcomes, Johanna was flexible in making quick changes. For example, during a lab students used shared digital documents and spreadsheets to collect and analyze data. One group of students wanted to do it by hand. Johanna simply stated, “do what works best for you.” She explained to me that she is mostly concerned about the learning outcome; if some students “get there differently, that is okay.” Interestingly, despite the evidence that Johanna easily integrated technology in her teaching, and was flexible about responding to student needs, her PCU score of two reflected little to moderate fluency with using digital tools and resources for student learning (“LoTi,” 2011). In this case, her survey results did not support interview and observation data. However, considering Johanna’s teaching style in her two classes drastically differed, even though science was her main subject, her score might reflect an overall approach to teaching.

Although Johanna regularly exposed students to different learning opportunities supported with technology, she expressed a concern with “plateauing” in terms of teaching. “I’m still doing the same things I’ve always done, just now with technology.” This form of substitution was an ongoing consideration of Johanna’s; throughout the informal observations she consistently asked, “what can I do different?” Looking ahead, Johanna wanted to experiment with time-lapse for units such as mitosis, and integrating audio and video for assessment. While not yet evident in practice, Johanna’s desire for transformation in teaching was explicit.

Case 4: Sharon. Sharon perceived her path to teaching as different than the typical experience. “I didn’t want to be a teacher. I had no idea what I wanted to do.” In her final year of college, after an array of experiences, she settled on a minor in education. It was not until many years after college that she landed her first teaching job, “then I never went back.” She is in her tenth year at Saint Stephen’s, and recently shifted from teaching Religion, math, and social studies, to teaching Religion and English. She described her personal use of technology as moderate, “I use technology to communicate, social media, some spreadsheets with family budgets, but not much else.” She expanded to say that she liked using technology, but felt she did not know enough to make it effective. “I always feel like I don’t know as much technology, and so I tend maybe not to use it so much.” Even in later interviews, Sharon consistently questioned her abilities and her effectiveness of using technology both personally and in the classroom.

Sharon’s personal descriptions and knowledge of technology contrasted with observations of regular classroom use. Although Sharon’s PCU score of two indicated little to moderate fluency with using digital tools and resources for student learning (“LoTi,” 2011), she regularly integrated technology in most of her teaching, especially in English. During one week of observations, I watched Sharon teach the process of narrative writing. Students completed assignments at home, and class time was used for peer feedback. Students wrote their narratives using their tablets, and then shared them digitally with their feedback partners. Sharon utilized used the Google Classroom workflow system, which allowed her to also provide regular feedback. She wanted to experiment with digital conferencing, and encouraged students to use different built-in

features of the writing tools to allow for that task. “The cyber-conference,” explained Sharon, “is a way for me to be involved in every student-student conversation. Conferencing digitally provides a conversation record. I can look at these conversations outside of class.” When responding to student questions, often Sharon did not respond directly to one student, but involved the entire class. She projected her laptop onto the classroom television to show, for example, a process or tool about which a student asked. In a follow up interview, Sharon expressed her desire to take this type of writing unit further. She wanted help students set up blogs so they could engage in dialogue with students from a sister school. A few weeks later, I asked Sharon if she had started this process. She admitted that she still had not figured out the best way to start a class blog, but stated, “it didn’t matter. The students just figured it out.”

Sharon’s initial integration of technology was a direct substitution of traditional writing. Students used tablets, as opposed to paper, to write their essays. However, transformation appeared when Sharon encouraged students to engage in digital conferencing to create records of conversations. Furthermore, her next step of sharing student writing with peers in different schools (and later clarifying that she wanted students to have real time conversations with peers in different states and countries), clearly provided learning opportunities not possible without technology.

Case 5: Laura. Laura “had a calling to be a teacher. So I’ve been a teacher my whole life.” She recalled teaching swimming lessons, gardening, prenatal aerobics, health, and more. She described a recurrent theme throughout her life of “taking people under my wings” and when her children went to college, she also went back to school for

a master's degree in education. Her content endorsements are in social studies and language arts, but upon seeing the Religion opportunity at Saint Martha's she thought "I can do that." Laura is in her second year of teaching now, and considers her current position "a gift." Another principle part of Laura's life is technology. She holds a degree in mass communications and views technology as a way to engage fun and enthusiasm in life. "It is sort of a really basic primal twenty-first century connection for me."

Throughout all of my interactions with Laura, there was rarely a moment when she was not teaching with, learning about, or inquiring about technology use. However, she made clear that she considered technology a separate piece from her teaching or desired student outcomes. She expanded with an example:

I teach it [technology] separately. The first thing I do with any technology is I let them play. Make a movie, learn how to do it. So I'll just give one whole day, one lesson of just fool around with it, figure out what to do, and then when they come back the next day, 'okay so you know how to do it. Here's the rubric.' Here are the requirements. And then I scaffold. And so we just start adding pieces and then so it will be a day or two with the iPad and then, or 20 minutes with the research, 20 minutes with the iPad. I've also folded in Google docs, was another thing I taught them, because I wanted to teach them how to do research and a bibliography, so if they're searching for images through the research tools in Google docs, then they have a great way of keeping everything on a document, and they can go back and look at those websites, so I fold that all in to the lesson.

I asked Laura when, if ever, she saw technology, pedagogy, and content coming together as one. “They come together in the project,” Laura explained. “I don’t just ask them to make a movie. I teach that, then fold in the content.”

Laura’s description of teaching with technology almost exactly paralleled observations. In one instance she was working with students on creating informational websites about the Peace One Day movement. Before students began adding content, they were instructed to spend time learning about website creation, playing with different tools, and figuring different layouts or themes. Not until students were comfortable with, for example, inserting links or editing webpages were they to start adding content related to the task. With this method, some students quickly moved on to researching Peace One Day and adding informational content to their website, while others needed more time to understand how to make a website. “You see,” said Laura, “you have to teach this, and then you teach that, and then you put them together. Some kids are doing this and some kids are doing that, and I just walk around and I can help them where they are.”

Laura’s PCU score of six accurately reflected her use of technology. She consistently demonstrated a high fluency level with using digital tools and resources for student learning (“LoTi,” 2011). Although her linear approach to teaching with technology was unique among the cases, the final projects that she referenced highlighted a clear modification of teaching and learning. For example, in one project students created videos to illustrate content and then used those videos to study for their assessment. Laura related the results as “amazing” and that “the students enjoyed learning from each other way more than from a book.”

Case 6: Mary. Mary described the combination of a love of content and relational learning as her motivation for becoming a teacher. She lived and taught in France for twenty-five years, and is now in her eleventh year of teaching Religion and French at Saint Stephen's. She described her knowledge and use of technology as ever changing and unpredictable. She recounted her experiences, before moving to France, as a member of the computer club, writing programs in BASIC, and "just feeling like an expert." However, technology changed so rapidly that when Mary returned to the United States, she "was way, way behind." She used the Internet for communication, but "technology as a teaching tool? I had little idea."

Throughout all interviews, Mary expressed many concerns with integrating "too much" technology in the classroom. She had questions such as, "is time figuring out technology sacrificing other learning or activity time?" Additionally, directly related to her content, a class focused on personal communication, she questioned "filling classrooms with artificial or mechanical devices" as authentic means of communication. However, in observation, I saw the opposite. She expressed consistent enthusiasm when using technology, and regularly inquired about new tools to support and transform instruction. For example, Mary admitted that teaching prepositions in French was not "the students' most favorite activity." Learning vocabulary was a process of memorization. However, Mary wanted to further engage the students and provide an opportunity for them to learn from each other. Instead of copying words from a text, in collaborative groups students created videos depicting different prepositions. Each group shared their video with the class, and students individually provided feedback on a shared

digital document. Each student received comments on how well the video helped other students remember prepositions, and Mary received feedback on the use of video in learning. She also asked the students to answer the question, how can I make this better? Although Mary's PCU score of three suggested only a moderate fluency with using digital tools and resources for student learning ("LoTi," 2011), observation of this lesson indicated a much higher level of technological ability. Furthermore, she suggested that student feedback from this lesson "made the next one better. Instead of telling the students they had to create a movie, I let them choose any tool they wanted."

The process of individual case analysis yielded valuable insight on how teachers integrated technology in their respective classes. I found examples of each teacher using technology as an instructional tool, yet they differed by type, or level, of integration. Therefore, I wanted to further understand how technology influenced practice, thus addressing the second research question.

How does the use of technology influence teachers' instructional practices?

To gain a deeper understanding of technology in teaching, I used Yin's (2009) case-oriented approach for cross-case analysis and applied the ISTE Standards•T as a lens. The ISTE Standards•T served as the framework to understand the skills and knowledge participants demonstrated to teach, work and learn in an increasingly connected global and digital society ("ISTE Standards for Teachers," 2014). I studied Mary as an in-depth case, and looked for similar or contrasting patterns throughout the other cases. I chose Mary's case as the reference example because her data highlighted all ISTE Standards•T in her teaching, as opposed to the other cases.

Facilitate and inspire student learning and creativity. Among the participants, Mary expressed the most concern about integrating too much technology. However, observation revealed that her facilitation of student learning experiences were the most technologically progressive and provided opportunities for student expression and creativity. She focused on student academic outcomes, reflection, and collaboration as primary goals for using technology; and if those goals were not being met, she allowed space for students to express their opinions on how to make their learning experiences better. This observation of Mary differed from her survey score. With a LoTi score of two, results indicated Mary's instructional focus emphasized direct instruction with little technology integration ("LoTi," 2011). However, her CIP score of five aligned with the data. The incorporation of students' opinions in her teaching leaned toward a student-directed approach. Laura demonstrated similar teaching methods. She initially focused on a technological tool, and then allowed for greater creativity and flexibility with student expression through the use of such digital tools. This corresponded to her LoTi score of four, which indicated the use of technology embedded in the learning process ("LoTi," 2011). When Laura allowed for more student voice and creativity after learning a digital tool, her CIP score of five more closely aligned with her teaching.

This contrasted with John and Elliot. Although they both integrated new technologies in their teaching to help students develop content knowledge, they did not provide time for student reflection or demonstrations of knowledge using digital tools. Despite a few instances of creativity or changes in their own teaching, there was little evidence those adjustments promoted the advancement of student creativity. Their

individual LoTi scores of two emphasized their teaching methods of direct instruction. Surprisingly, both John and Elliot scored higher on the CIP scale (four and five respectively), which indicated a student-centered approach to learning (“LoTi,” 2011). Neither interview nor observation data supported their survey CIP scores.

Design and develop digital age learning experiences and assessments. Mary’s eagerness to redesign some of her, as she stated “traditional ways of teaching,” demonstrated a desire to develop more digital learning experiences for her students. In the case of the preposition lesson, Mary acknowledged that students were in different places with their vocabulary comprehension. Therefore, through the use of video students illustrated their own progress and understanding of prepositions based on the words and definitions they used. Mary revealed that this knowledge helped her develop more personalized assessments, and through the use of a digital classroom management system she was able to distribute individualized assessments based on student knowledge.

This significantly differed from Johanna’s opinion on the use of technology in teaching and learning math. While she talked about a few software programs that assisted students with reviewing material, Johanna was adamant that using more technology would not increase or maximize content learning. “Tech helps target kids that are having difficulty, and helps plug holes, but we can’t stop. You have to stay on board. If you fall off the wagon in October, you are not going to get back on.” Additionally, in teaching math there was one goal: be ready for a high school honors track. Johanna’s LoTi score of zero confirmed interview and observation data regarding math; her instructional focus was on direct instruction without digital tools (“LoTi,” 2011).

Additionally, her CIP score of three further corroborated the data; her practices emphasized a teacher-directed approach (“LoTi,” 2011). While consistent with her math teaching, these scores were surprising in consideration of science instruction, where she regularly used technology and allowed for more student creativity and flexibility. However, interview data contrasted with observation data and further supported her overall survey scores. Johanna expressed a “skepticism about student involvement and voice in decision making – how far do we take that?” She expanded to question the benefits of promoting student creativity at the risk of not covering science content. “I think language arts can incorporate more. I’m science. I’m that body of knowledge, standing on the shoulders of those before you. That’s going to look a lot different in terms of how to include the kids.”

Model digital age work and learning. “I think it is beautiful to be learning together.” Mary consistently expressed a love of collaborating with and learning from students. She saw technology as a way to bridge “all the lives of students” together; Mary recognized that what students did in school and out of school could be very different, and technology might allow school experiences to be more relevant and meaningful for students. Furthermore, she appreciated the “power of technology” to help teacher-student-family communication and collaboration.

Sharon also consistently modeled digital age work and learning. Among the cases at Saint Stephen’s, Sharon was an early adopter of a digital classroom management system. Initially she expressed a few frustrations with its functionality, but she turned to the students to work through some of the technological issues. Observation data of

Sharon's teaching did not support her LoTi score of two, which emphasized direct instruction through the integration of technology only for extension activities ("LoTi," 2011). Even prior to taking the survey, I regularly observed Sharon integrating technology in daily classroom activities to support student learning, work flow, and organization.

All at the same school, Mary, Sharon, and Johanna demonstrated digital age work through their communication and collaboration among all teachers. They shared with me a number of digital documents that contained on-going virtual conversations related to technology issues, content questions, lesson ideas, resources, and other similar digital age topics. They emphasized the importance of these documents; through a combination of informal conversations they highlighted the time saved by communicating asynchronously about non-time sensitive issues, as opposed to taking face-to-face meeting time.

Promote and model digital citizenship and responsibility. Mary, Sharon, and Johanna regularly collaborated on integrating digital citizenship and responsibly in all of their teaching and student learning experiences. With those three participants, digital citizenship was accentuated during every interview, observation, and other face-to-face conversation; they promoted digital etiquette and responsibility with all actions related to teacher and student technology use. I observed them regularly engaged in conversations about ethical and respectful online social interactions and respect for digital intellectual property. In addition to regular in-class activities that promoted digital responsibility, they held regular whole school (middle grades) assemblies structured around responsible

technology use. These types of sessions were developed initially by the teachers, but turned over to the students to lead conversations on safe, responsible, and respectful actions in a digital world.

Data singled out Laura as the only case from Saint Martha's that promoted this same level of digital citizenship. However, opposed to the collaborative nature seen in Mary, Sharon, and Johanna's instruction, Laura took it upon herself to model appropriate use in her classes. She integrated elements of technological responsibility in her lessons. For example, after students created videos for one unit, they posted them online and practiced making constructive and appropriate comments to one another. Data did not confirm John or Elliot integrating elements of digital citizenship in their teaching; that is not to say they were purposefully ignoring the components of digital age responsibly, but they were not seemingly promoting it.

Engage in professional growth and leadership. Every teacher in this study engaged in professional development and teacher learning. They all participated in monthly workshops and meetings related to technology tools, student learning environments, digital citizenship and other twenty-first century digital age goals.

Mary stood out from all the cases with her commitment to improving her practice continuously through teacher learning and leadership opportunities around technology integration. During the time of this study, she participated in four different teacher workshops or conferences, and regularly watched webinars on a variety of educational topics. Without a formal dissemination space, she took it upon herself to share her knowledge with colleagues through the aforementioned asynchronous digital

documentation, or during teacher meetings. Additionally, Mary often referred to the benefits of participating in research. She addressed the advantage of self-reflection through interview, observation, and survey. Laura expressed similar opinions. She was excited about all observations, and always quick to engage in follow up conversations related to her teaching practices. Furthermore, Laura was part of the Teacher Leadership Team at Saint Martha's, and committed extra time advancing teaching and learning opportunities with technology among the other teachers.

Key Findings and Implications for Practice

Data analysis revealed two themes related to integrating technology and instruction, personal opinions of technology, and minimal transformation. These themes are presented here with implications for teacher practice.

Personal Opinions of Technology

The data illuminated a connection between teachers' personal beliefs and use of technology and the corresponding amount and type of technology integration in their teaching. Laura and Mary described strong backgrounds in technology and personal use of technology, and their interview and observation data elucidated their incorporation of technology in teaching, learning, and professional development. John and Elliot questioned the importance of technology in their everyday use, and their demonstrated lack of classroom use paralleled their personal beliefs. This finding corresponded to Ertmer and Ottenbreit-Leftwich's (2010) study on technology integration and teacher change. They contended teachers' mindsets and attitudes toward technology needed to change in order to support effective twenty-first century instruction (Ertmer & Ottenbreit-

Leftwich, 2010). For example, John clearly expressed his aversion toward technology, “I don’t enjoy it. I don’t use it in any way shape or form for fun,” and he only incorporated “Tech Fridays” because of “the tech factor for the students.”

There is a need for Catholic educators to increase their awareness of twenty-first century education, and the associated transformation of teaching to support an evolving digital culture (Zukowski, 2012). Students are entering Catholic schools with digital age skills and habits (Zukowski, 2012); among the many educational challenges teachers face in the twenty-first century, Catholic educators must also contend with enrollment decline and closing schools (Nuzzi et al., 2014). Therefore, innovation in teaching with technology emerges as an essential component to remaining relevant in a dynamic educational environment. Data suggested that finding a balance between personal opinions of technology and teaching style was a key component to technology integration.

Balance. Mary understood this need in relation to the connection between students’ in and out of school lives. Although Mary often questioned the overuse of technology, she understood the necessity of bridging students’ personal and educational experiences and interests. She was an example of being able to balance personal opinions of technology with needed evolving practice. Mary focused on technology as a means of increasing the teacher-student-family connections, thus strengthening the overall school environment. Johanna demonstrated balance in teaching science with her ability to recognize when technology was enhancing, as opposed to challenging, learning.

In her science classes she encouraged students to use technology when it was useful, not just to use it because it was available.

Other teachers that described a personal aversion to technology often referred to too much screen time or the passive consumption of digital content. John, for example, expressed that opinion and questioned student use with the same skepticism. During interviews he implied that technology was not necessarily useful as a teaching and learning tool, and only integrated digital tools because he knew students liked to use them. When I observed John it was apparent that his personal opinions of technology were driving his teaching practices. He struggled finding a balance between his own opinions of technology use and those of the students.

The distinct contrast in technology usage led to my consideration of balance between technology and teaching style. John used an app to address one skill, or just to use technology, while Mary and Johanna integrated technology to enhance or develop a variety of skills. By doing so, they provided opportunities for students to develop twenty-first century skills and habits; Mary focused on increased communication and collaboration while Johanna allowed students to direct their own learning through providing the digital resources, but permitting choice in usage. In these two cases, they focused on the outcome as the driving force for integrating technology, as opposed to the technology itself.

Minimal Transformation

Frequency of technology integration ranged from lower (John, Elliot, and Johanna in math), to higher (Mary, Laura, and Sharon). In analyzing the cases through the SAMR

framework, higher incidence of technology use indicated a clear enhancement (substitution or augmentation) of teaching; however, there was an evident lack of transformation (modification or redefinition). However, across the cases that demonstrated enhancement in teaching, the overall perceived implication for student learning was students were engaged more in their work, which in turn resulted in increased academic outcomes. Innovative teaching methods are a goal of twenty-first century education (Dede, 2010a; Ertmer & Ottenbreit-Leftwich, 2010; “ISTE Standards for Teachers,” 2014; Zukowski, 2012), and the SAMR model suggests that the transformation level supports such practices (Puentedura, 2010; Schrock, n.d.). However, if teachers experienced shifts in their practice at the enhancement level with noticeable student learning gains, one might wonder, is enhancement sufficient?

Hooker (2013) reflected on his own practice through the SAMR framework and compared technology integration to swimming; the enhancement level was the shallow end and the transformation level was the deep end. He stated that before venturing into the deep end, one must be comfortable “wading in the water... teachers sometimes need to walk in slowly, allowing their bodies to adjust to this shift.” Laura represented this process with her linear approach to integrating technology; she taught the tool, embedded the content, then provided space for more innovative teaching and student creativity opportunities. Johanna focused on her specific students’ needs in math; technology could support those who needed review, but would not be useful in promoting content knowledge. She maintained this was good teaching; she had one goal (high school

preparation) and she was achieving that goal. At this level of substitution, I perceived that Johanna had no intention of wading into Hooker's (2013) deep end.

In this regard context played a significant role in teaching practices. Research points to a lack of understanding about the interactions between specific contexts and teaching practices with technology (Angeli & Valanides, 2009; Doering, Veletsianos, Scharber, & Miller, 2009; Koehler et al., 2014). Johanna spoke specifically to this interaction when she expressed her opinion that a language arts class would have more opportunity for transformative teaching and learning (as compared to her math or science classes). Data supported this opinion; higher levels of enhancement were found in English, Religion, and French, classes that were not held to scripted student standards. Therefore, if Catholic researchers and educational leaders are calling for more innovation in teaching, and technology integration is not necessarily promoting transformative teaching across all disciplines, what might innovative education look like in this context? Data suggested the following concluding theme as one approach to teaching with technology that allowed for teachers across all content areas to shift their approach to instruction.

Shifting Classroom Roles. The ISTE Standards•T emphasized the promotion of creativity and innovation throughout all teacher goals and outcomes to support twenty-first century student learning ("ISTE Standards for Teachers," 2014). In rethinking creativity's role in education, Anderson and Krathwohl (2001) promoted creativity from Bloom's (1956) taxonomy of educational objectives to be the most complex cognitive process in learning (Morphew, 2012). Other researchers proposed inquiry-oriented, or

constructivist, approaches to teaching fostered student creativity (Morphew, 2012; B. Y. White & Fredericksen, 1998). Morphew (2012) further suggested that collaborative experiences between teachers and students, acknowledging both as important contributing members to the learning environment, can enhance creativity. This requires a shift in traditional teacher-student classroom roles (Fullan & Langworthy, 2014). Mary and Sharon demonstrated this shift, highlighting instances when students solved problems. As Sharon stated, she did not need to figure out how to set up a blog because the students did it instead. Although this was an example of a distinct problem, Sharon stressed that allowing students to solve problems independently on a “smaller tech scale” enhanced their ability to solve problems across a larger spectrum.

Johanna approached student creativity from a student awareness perspective. She recognized that students learn differently, and for some technology was not the best tool for learning. She allowed students in science to choose whether or not they used digital tools, as long as they were meeting learning outcomes. This aligned to Morphew’s (2012) suggestion that, to promote student learning through creativity, teachers should make informed educational decisions about their individual needs, and allow space for digital and non-digital technologies. John personally decided to use a digital application for learning algebraic equations; following Mary’s process, he could have provided more choice for students – either use the app or the hands-on manipulative. As educators, and in this context Catholic educators, look to shift teaching to support goals of twenty-first century education, technology can support a collaborative and communicative learning environment, but teachers need to allow space for teacher-student learning partnerships.

Versatility in teaching promotes a dynamic learning environment. As Mary stated, “you can’t think of everything on your own, and exchanges with students are so enriching.”

Limitations and Recommendations for Future Research

Although qualitative research was best suited for this inquiry, several limitations should be noted. First, this study was limited to two Catholic schools in a Northeastern community with low racial/ethnic diversity. Therefore, generalizations about findings should not be made to other educational settings. However, the application of cross-case analysis yielded possibilities to enhance recommendations to schools and teachers of a similar context (Miles & Huberman, 1994). Second, this study was bounded by a specific time frame (Creswell, 2013). Although findings and themes were applicable to teachers’ current instruction, it is difficult to make future predictions of teachers’ practices. Last, consistent with qualitative research, direct involvement with the teachers may have resulted in personal biases and opinions in data analysis (Creswell, 2013). To limit potential areas of bias, I applied several measures of trustworthiness. I triangulated different data sources of information and presented negative or discrepant information (Creswell, 2013); I spent a prolonged period of time with each teacher to develop an in-depth understanding of each case (Yin, 2014); I used rich description of each teacher to convey the findings (Creswell, 2013); and I applied multiple coding strategies to enhance transferability of the findings (Miles & Huberman, 1994).

Although this study provided perspective on different ways Catholic middle school teachers integrated technology in their respective practice, it also highlighted the need for additional research. The issue of context was revealed throughout the data, both

in terms of content and teacher background. Furthermore, context in relation to the broader environment of Catholic schooling emerged during several interviews. For example, while both schools are Catholic, one is a diocesan school and the other sponsored through a different Catholic association. How those differences relate to teachers' instructional practices require additional, school level, inquiry. While this research provided a base for understanding contextual considerations, future research on the relationships between teachers, school context, and technology integration is warranted. Similarly emphasized by Ertmer and Ottenbreit-Leftwich (2010), and specifically in Catholic education by Zukowski (2012), teachers will not change their practices without developing an understanding of good teaching in their specific contexts, and how those contexts are evolving in a digital culture.

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Appendix

LoTi Framework adapted from LoTi, 2011

Level	Technology Use	Instructional Methods
0: Non-Use	The use of digital tools in the classroom is non-existent	Instructional focus ranges from direct instruction to a collaborative student-centered environment
1: Awareness	Digital tools are used by the teacher for curriculum management or by the students as a reward unrelated to classroom instruction	Instructional focus supports lecture and lower cognitive skill development
2: Exploration	Digital tools are used for extension activities	Instructional focus emphasizes direct instruction
3: Infusion	Digital tools are used for teacher-directed tasks	Instructional focus emphasizes higher order thinking and a variety of thinking skill strategies
4a: Integration (Mechanical)	Digital tools are used to answer student-generated questions	Students engage in exploring real-world problems and instructional focus emphasizes applied learning
4b: Integration (Routine)	The use of digital tools is inherent and embedded in the learning process	Students are fully engaged; instructional focus emphasizes learner-centered strategies
5: Expansion	Digital tools are used with sophistication and support students' levels of complex thinking	Collaboration extends beyond the classroom
6: Refinement	There is no division between instruction and digital tool use	The instructional curriculum is entirely learner-based

CIP and PCU Framework adapted from LoTi, 2011

Intensity Level	PCU Framework	CIP Framework
0	Indicates that the participant does not possess the inclination or skill level to use digital tools and resources for either personal or professional use	The student is not involved in a formal classroom setting (e.g., independent study)
1	Indicates that the participant demonstrates little fluency with using digital tools and resources	The participant's current instructional practices align exclusively with a teacher-directed

	for student learning	approach relating to the content, process, and product or instruction
2	Indicates that the participant demonstrates little to moderate fluency with using digital tools and resources for student learning	Supports instructional practices consistent with a teacher-directed approach relating to the content, process, and product, but not at the same level of intensity or commitment
3	Indicates that the participant demonstrates moderate fluency with using digital tools and resources for student learning	Supports instructional practices aligned somewhat with a teacher-directed approach
4	Indicates that the participant demonstrates moderate to high fluency with using digital tools and resources for student learning	The use of a teacher-directed approach is the norm, but there is an increased frequency of student-directed decision-making or input into the content, process, or product of instruction
5	Indicates that the participant demonstrates a high fluency level with using digital tools and resources for student learning	Instructional practices tend to lean more toward a student-directed approach. The essential content embedded in the standards emerges based on students “need to know” as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills
6	Indicates that the participant demonstrates high to extremely high fluency level with using digital tools and resources for student learning	The essential content embedded in the standards emerges based on students “need to know” as they attempt to research and solve issues of importance to them using critical thinking and problem-solving skills
7	Indicates that the participant possesses an extremely high fluency level with using digital tools and resources for student learning	The participant’s current instructional practices align exclusively with a student-directed approach to the content, process, and product of instruction

CHAPTER SIX

Scholarly Article 3

Exploring the Balance Between Catholic Schools' Educational Goals, Teaching Practices, and Technology Integration

Introduction

Technology provides access to information, the ability to communicate, and opportunities to collaborate on a universal scale unparalleled to prior decades. Preparing students to become active and effective contributors in a this knowledge-based, connected world requires a fundamental change in educational pedagogies (Fullan & Langworthy, 2014). Technology initiatives in education are becoming the standard, with teacher and student access to devices doubling over the past two years (Daniels et al., 2014; Speak Up, 2013). The commonly cited goal of supporting and enhancing twenty-first century skill development (Argueta et al., 2011; Johnson et al., 2014; Muir, 2007) calls for necessary changes in teaching practices to encourage such contemporary learning skills and outcomes (Sauers & McLeod, 2012; Shapley et al., 2009). However, research has revealed little evidence of actual shifts in teaching practices that support twenty-first century skill development (Cuban, 2006; Daniels et al., 2014; Galla, 2010; Gibbs et al., 2008; Gunn & Hollingsworth, 2013; Weston & Bain, 2010a).

Ertmer and Ottenbreit-Leftwich (2010) suggested that the qualities that enable teachers to leverage technology as a meaningful tool include knowledge, self-efficacy, pedagogical beliefs, subject and school culture. The relationships among those characteristics are explored through various twenty-first century teaching and learning frameworks, with the technological, pedagogical, and content knowledge (TPACK)

framework dominating the literature (M. J. Koehler et al., 2014). However, the distinctions and intricacies between different teaching contexts and school environments is changing continuously, and focused research on context is an ongoing need (Angeli & Valanides, 2009; Ertmer & Ottenbreit-Leftwich, 2010; M. J. Koehler et al., 2014).

In the twenty-first century, the Catholic school context provides a unique opportunity to understand technology integration and teaching practices, as Catholic schools are not only faced with twenty-first century teaching and learning demands but also are challenged by enrollment decline and school closures (Kennedy, 2013; Nuzzi et al., 2012). Families that seek private schooling often look for alternatives to secular education (Hunt & Carper, 2012); of the 5.5 million students enrolled in K-12 private education, nearly half are enrolled in Catholic schools (“Catholic School Data,” 2013, “K-12 Facts,” 2014). Nuzzi et al. (2012) recognized the importance of Catholic education by highlighting the strong reputation of academic scholarship, community contributions, and student growth in conscience and faith. Despite the numbers of students participating in Catholic education, and the historical reputation of Catholic schooling, demographic shifts, changing economies, and a more secularized society contribute to a steady enrollment decline (Nuzzi et al., 2014). Catholic educational leaders, policy makers, and researchers advocate for innovative teaching practices in order for schools to remain competitive and relevant in the public and private educational landscape (Kennedy, 2013; O’Keefe & Goldschmidt, 2014; Zukowski, 2012). However, in addition to the financial burdens plaguing Catholic schools, maintaining and strengthening the Catholic identity and faith has emerged as a contemporary challenge

(Nuzzi et al., 2012). At the turn of the century, Antczak (1998) recognized that in the twenty-first century Catholic education, and curriculum, would change. However, she raised questions about the overall impact on the purpose of Catholic school, and specifically focused on the overriding religious purpose - to teach the Gospel.

Furthermore, at the most recent meeting of the Research on Catholic Education Special Interest Group at the American Educational Research Association, Catholic leaders and researchers called for increased attention and new research directions to include the intersection of Catholic schools' religious values with instruction (Nuzzi et al., 2014).

In order to explore the context of Catholic education, and specifically the balance between technology integration, teaching practices, and Catholic educational goals, I posed two research questions: (1) How do middle level Catholic educators perceive their teaching practices align with Catholic educational goals? (2) How does technology support middle level Catholic educators' instructional goals? And (3) how does technology challenge middle level Catholic educators' instructional goals?

Theoretical Framework

Catholic Education in the Twenty-First Century

In response to school closures and declining enrollment, many Catholic educators and leaders are attempting to re-shape Catholic school learning for the twenty-first century (Kennedy, 2013; Nuzzi et al., 2012). "Catholic schools must integrate their vision with reality by retaining their purpose and character by moving forward academically and technologically" (Boland, 2000, p. 515). Responding to a rapidly

advancing technological society requires Catholic schools to understand the balance between faith and educational values in a digital age. Recognizing the need to move from twentieth to twenty-first century teaching and learning, Zukowski (1997) suggested a complete paradigm shift in Catholic education. However, Antczak (1998) countered that the overriding religious purpose to teach the Gospel must be clear in all Catholic school activities. Many assert that Catholic schools need to evolve before they become irrelevant in a dynamic changing educational landscape (Kennedy, 2013; O’Keefe & Goldschmidt, 2014). However, despite early conversations recognizing that the twenty-first century calls for updated approaches in Catholic education, minimal research has been completed on the complexities of Catholic education in a digital age (Tellez, 2013; Zukowski, 2012). While technology allows for the innovation, connections, and collaborations called for by researchers such as Kennedy (2013), O’Keefe and Goldschmidt (2014), and Zukowski (2012), understanding the growing need for technology integration in support of twenty-first century skill development, and how that melds with the philosophy and purpose of Catholic education, emerges as an important issue as schools move forward with technology initiatives.

Although the research base on technology integration specifically in Catholic schools is small compared to the comprehensive public school research, studies that have focused on technology in Catholic education demonstrate noteworthy findings. Using survey data from 319 Catholic school principals, Gibbs, Dosen, and Guerrero (2008) examined technology in Catholic K-12 schools in Illinois. The study revealed that, while teachers in most schools used technology, overall teachers were not consistently engaged

in technology as a tool for teaching. Galla (2010) similarly used data from administrators and focused on leadership styles, practice, and the process, procedures and actions of implementing technology. Through observations, interviews, and document collection from five leaders at three Catholic schools, he concluded that collaboration from all stakeholders involved in technology implementation was imperative for success.

Zukowski (2012) focused on creative ways to encourage a positive digital culture. She highlighted social media, virtual worlds, digital libraries, and distance learning as ways to enhance learning in the twenty-first century. Cho and Littenberg-Tobias (2014) looked at a one-to-one initiative and acknowledged that technology yielded new collaboration opportunities, but reported that teachers questioned any increase in student learning due to the elements of digital distraction. Although valuable in exploring the implications of technology in Catholic education as they relate to increasing innovation in education, a limitation of these studies was the absence of discussion of technology integration within a Catholic school context.

Foundations of a Catholic School

Miller (2006) detailed five elements of a Catholic school as necessary to maintaining and strengthening its identity, which comprised the fundamental purpose and mission of Catholic schools. First, Miller pointed out that a Catholic school must be inspired by a supernatural vision. Education must be more than an “instrument for the acquisition of information that will improve the chances of worldly success” (p. 178). Second, a Catholic school must be founded on a Christian anthropology, and to be worthy of the Catholic school name must be founded on Jesus Christ. He (Christ) must be the

center of a school's mission, and the gospel of Jesus Christ is "to inspire and guide the Catholic school in every dimension of its life and activity" (p. 208). Miller acknowledged that many Catholic schools fall "into the trap of secular academic success" (p. 224) and emphasized Jesus Christ as a school's vital principle. Third, a Catholic school must be animated by communion, and emphasize school as a community. A Catholic school must be true to its identity, and "express physically and visibly the external signs of Catholic culture" (p. 336). Additionally, prayer must be a normal part of the school day, and acts of religion should be perceived in every school. Fourth, a Catholic school should be imbued with a Catholic worldview and the "spirit of Catholicism should permeate the entire curriculum" (p. 336). A Catholic school must educate the whole person, therefore all instruction, not just religion, must be authentically Catholic in content and methodology. And fifth, a Catholic school must be sustained by gospel; that is teachers and administrators are responsible for creating a Catholic school climate. "Catholic educators are expected to be models for their students by bearing transparent witness to Christ and to the beauty of gospel." (p. 478). I used Miller's detailed elements of a Catholic school as a primary coding framework in that data analysis to explore and understand the Catholic identity of the school and participants.

Understanding the pressures Catholic schools are facing in the twenty-first century, Cook and Simonds (2011) provided a new framework to help Catholic schools remain relevant and competitive in today's educational environment. They acknowledged the importance of Church documents as elements of inspiration and guidance, but noted that the practical application of such documents to modern

educational structures is a challenge. Therefore, Cook and Simonds' framework (Figure 6.1) "offers a coherent and relevant way of looking at Catholic identity and charism in contemporary schools" (p. 321).

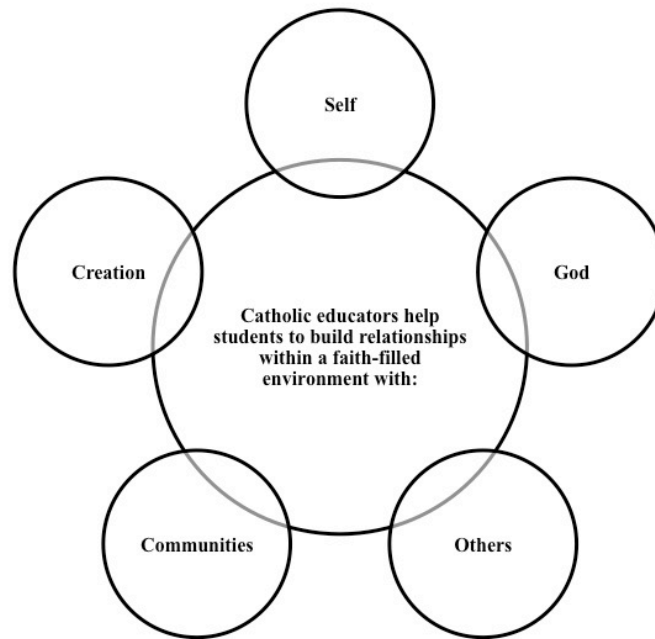


Figure 6.1. Adapted from a Framework for the Renewal of Catholic Schools (Cook & Simonds, 2011)

Built upon a culture of relationships, this model has the potential to help students understand the modern complexities between culture and faith. Furthermore, Cook and Simonds proposed that the application of the framework could help Catholic schools "clarify what sets them apart from all other schools, more effectively recruit students, and enable their graduates to change the world by building relationships instead of fences" (p. 330). I used Cook and Simonds' framework, in addition to Miller's (2006), as another coding structure in the data analysis. The focus on relationships helped to highlight

specific elements of the school's mission and the participants' opinions of the purpose of Catholic education.

Methodology

Research Design

This study began as a Catholic K-8 school, Saint Stephen's, received funding for a three-year teaching and technology initiative. Saint Stephen's entered into a university partnership and middle level (grades 6-8) faculty were provided professional development, leadership and planning, and educational technology (for teachers and students). The partnership yielded a unique opportunity to research changing pedagogies to support teaching and learning with technology within the context of Catholic education. Thus, to further understand the balance of twenty-first century education and the Catholic identity and faith as described by Nuzzi et al. (2012), I used qualitative inquiry to explore and understand individual teacher experiences (Creswell, 2014). I used multiple-case study to develop an in-depth analysis of each teacher, and to explore a series of *how* questions (Creswell, 2014; R. K. Yin, 2014). I applied cross-case analysis between teachers to deepen the awareness and insight of the relationships between technology, teaching, and Catholic educational goals (Miles & Huberman, 1994).

Sites and Participants

In order to determine teacher participants, I first identified Saint Stephen's as a site based on its Catholic education affiliation, and the recent adoption of a technology initiative. Saint Stephen's is an accredited, private K-8 Catholic Diocesan school situated

in a suburban community in the Northeast. Embracing the values of Catholic Diocesan education, and from its philosophy statement, Saint Stephen's mission focuses on educating the whole person in light of the Catholic Faith and leading students to an authentic relationship with Jesus Christ. Prior to the partnership, Saint Stephen's middle level teachers and students had access to a shared computer lab with desktops. In the second year of the partnership, Saint Stephen's implemented a middle level one-to-one initiative, that is all teachers and students were provided an internet capable device for continuous use at school and home. New technologies introduced included individual teacher laptops, classroom TVs, and individual teacher and student tablets. Four middle level teachers (out of five possible educators) agreed to be part of this study.

Sharon. At the start of the study, Sharon was in her ninth year teaching Religion, math, and social studies at Saint Stephen's. In the second year of the study, Sharon taught Religion and English. She "wasn't the kid who wanted to be a teacher," but after her first teaching job in a different Catholic school she "loved it" and has since continued to teach only in Catholic schools.

Mary. Mary was drawn to teaching through her love of literature. She was motivated by the relationship piece of learning because "you can't think of everything on your own." After teaching and studying in France for 25 years, she returned to the United States and was in her tenth year teaching French and Religion at Saint Stephen's during this study. She also facilitated Faculty Faith formation.

Scott. In the first year of this study, Scott was in his third year teaching English, social studies, and Religion. His educational background was in English and philosophy,

but it was his work on an ambulance that sparked his interest in classroom teaching. “Every time we had a call for a kid, I always felt like, I wanted to go beyond just a call.” At the start of the second year of the study, Scott left his position at Saint Stephen’s to become a technology integration specialist in a public school district.

Johanna. Johanna’s background was in nuclear engineering, and her professional work (prior to teaching) had been at a local technology company. Her children attended Saint Stephen’s and, during one of their middle level years, the school lost its science teacher. Johanna thought, “I can teach that – I always loved teaching at the community college” and her one-year temporary position turned into a permanent science teaching position. Johanna was in her tenth year of teaching science and 8th grade math.

Data Collection and Analysis

Data were collected from October of 2013 through November of 2014. Consistent with qualitative case study design, I preserved multiple characteristics of qualitative inquiry throughout the data gathering process (Creswell, 2014; Marshall & Rossman, 2011). First, all data were collected in the natural setting of the participants, namely the school. Second, I played a key role in the research process; I personally collected and analyzed all data. Last, I used multiple sources of data. Interviews allowed for detailed descriptions of the experiences and of the participants (Crowe et al., 2011); observation provided deeper insight of teachers’ teaching methods, and helped to “gain insider views and subjective data” (Creswell, 2013, p. 167); historical documents and field evidence (mission statement, school policies, strategic plans, school iconography, classroom set up, teacher reflections, teacher created photographs and videos of lessons,

email correspondence, teacher blogs or websites, and informal teacher conversations) were collected from the physical and social environment to deepen my knowledge and understanding of context (R. K. Yin, 2014).

I interviewed teachers first individually, then in focus groups, for approximately 60 minutes for each interview. Questions addressed teachers' background, content, pedagogy, technology use, beliefs and understandings of twenty-first century education, personal educational values, and interpretation of school philosophy. I was an active participant at the school; therefore observation took two different forms. First, I formally observed teachers in their classrooms and recorded data without direct involvement with the teachers or students. I observed teachers twice for 50 minutes per observation. Second, I was an active contributor to teachers' lesson planning and classroom activities, and at this level of participant observation I was involved with each teacher approximately four times per month for fourteen months. Third, I used historical documents to reduce the issue of reflexivity; that is, these data were created for reasons beyond the research inquiry thus not influenced by the study itself (Yin, 2014). I collected field evidence to gather additional individual teacher data on classroom practices and environmental context.

Data were analyzed following a general inductive approach through the emergence of themes embedded in frameworks (Suter, 2012). First, I used a priori coding based on Miller's (2006) elements of a Catholic school, and Cook and Simonds' (2011) framework for the renewal of Catholic schools. Second, I developed additional

codes and themes on the basis of emerging information collected through the various data sources (Creswell, 2014) (Figure 6.2).

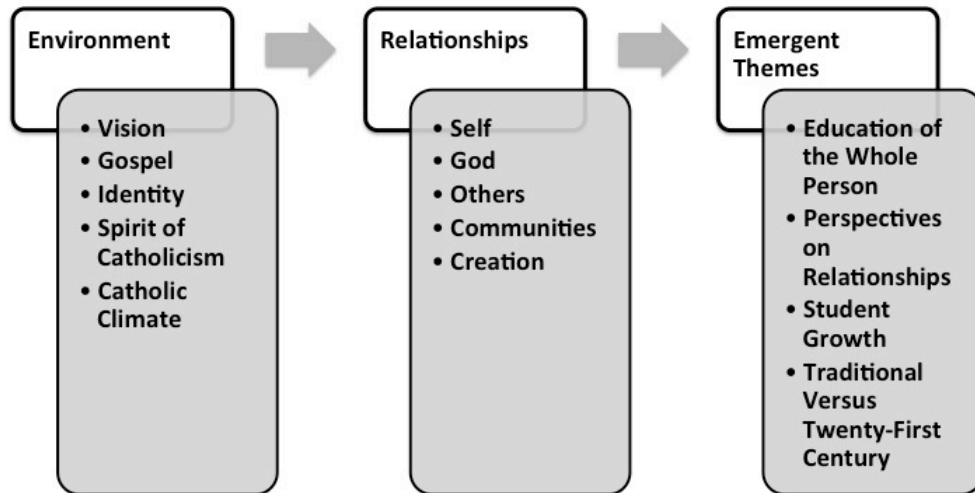


Figure 6.2. Coding Framework

Findings

To explore the research questions, teachers were asked to reflect on the school mission statement, their personal instructional practices, and the influence of technology on their teaching as it related to Catholic educational goals. Data from observations provided additional supporting or contradicting evidence. Individual and cross-case analysis of the data revealed four dominant themes: education of the whole person; perspectives on relationships; student growth; and traditional versus twenty-first century teaching.

Education of the Whole Person

Teachers were asked to describe the school mission and how their teaching models or embraces the values of the school. Johanna first defined the school, “we are a Catholic school; a Christ centered, religious school.” She described how she was part of the administrative team that developed the current mission, and that the incorporation of the mission in everything about the school was why her kids went there and “why I will never be able to walk away from here.” She continued to reference the educational philosophy as “whole person body and soul.” When asked about her teaching and whether she modeled the mission in her instruction, Johanna hesitated with her answer, “I [pause] think [pause] so.” But she quickly started to describe an example. She referenced teaching evolution in science and the complex questions that the students ask. Johanna explained that she asks the Saint Stephen’s parish priest to talk to the students about the differences between the Bible and the science text. She followed up these conversations with students explaining to them,

Number one, God created the universe and this is his plan unfolding. Number two, believe that man has a soul and there was some distinct point they we became different, imbedded with soul. Not just random acts. We use the intellect God gave us to see the world. For the sixth graders it is a little bit more interesting because we talk about the definition of time. When you talk about the Old Testament - you can have stories and things that tell you about the Truth without being factually true. And making the distinction between that...this is an amazing plan laid out by God.

Johanna valued the connection between her content and Catholic teachings and felt it her responsibility that students were aware of the balance between the two. She also felt that, by integrating more technology into her practice, she would be able to further engage students with the content and expose them to “hopefully” a greater love of science. “I don’t know what happens to little kids who in first grade are born scientists and when they get to high school go right down hill with it. I don’t want to be part of that.” In practice, I observed Johanna using technology to enhance lessons; digital collaboration space allowed for a greater amount of group work and students were able to share, for example, data, reflections, and other classroom tasks. I observed one group use such tools to involve a student that was absent just as much as a student that was in the room. Johanna’s flexibility with student choice in using technology illuminated her approach to educating the whole student. For some students, using a digital tool was not working for them to complete a specific task. Without hesitation, she encouraged them to use a tool that suited them best. In a follow up conversation, Johanna emphasized, “there are different kinds of learners,” and education of the whole person included development, not just of one student but also of all.

Mary spoke about the connection between content and faith, and emphasized that faith is not one part of a student, “it englobes our whole being – we are living it.” Mary spoke about her work with colleagues in Faculty Faith Formation; a regular workshop for teachers that focused on embedding Catholic beliefs and values in curriculum and practice. She underlined the need for faculty to embrace and model Saint Stephen’s mission in order for students to understand Catholic education from an interdisciplinary

perspective, and to be able to grow in all areas, not only for example, in Religion. “This school is firmly committed [to Catholic education] that we all need to walk the talk, live the faith for the transmission to happen. It is part of the community that we live.” In practice, Mary consistently modeled her opinions. Regardless of the class (Religion or French), she put Christ and faith first either through prayer, song, or her interactions with students. She posed questions that asked students to reflect on their actions through the philosophy of the school, and engaged in self-reflection by asking whether or not she was embracing Catholic values. Mary expressed concern about consistency of the practice of faith between home and school, and emphasized the need to “live the body of Christ; and how we treat each other how we walk in the halls and all of this should be true to what we are inside.”

Mary was excited about increased technology in the classroom. She acknowledged that too often Religion was a “different sphere” in students’ lives and was hopeful that by integrating technology, something of interest to students, she would be able to bridge a gap between Religion and students’ other interests. She believed that to educate a whole child, she needed to help integrate the two; “Religion needs to be there in order for it not to be something externalized but brought into their everyday world.”

Perspectives on Relationships

Sharon spoke to the education of the whole person, but in doing so she focused on the relationship with God. She defined Saint Stephen’s mission by emphasizing dignity of every person and helping students build, and maintain, a personal and spiritual relationship with God. In teaching Religion, Sharon spoke about the time she spends in

the beginning of each year recognizing the gifts and values of each student and his/her contributions to the class and community. She considered herself the maternal teacher, “we will talk and we will discuss feelings and we will just look at the whole, just our person; I’ll put academics aside if we need to.” I asked her to expand, and she described their morning meeting,

We have our circle of power and respect, we, I spend a lot of time just building our community. And there are times when we, that we will talk about some, whatever, if there's something bothering us, or if we need to address a problem that, yeah we'll put academics on hold and solve the problem. A lot of times it might be just complaints about something else or something that's happened that they feel indignant about. And I’ll just give them a time to air their grievances. We just try to talk.

Sharon felt that allowing space to do this type of relationship building in Religion would transfer over to other classes. I observed her teaching English, and I saw similar aspects of relationship and community building. Hanging on her walls were student created words and images of respect and community, with Scripture as a border. Sharon also consistently encouraged conversation and open dialogue with and between students.

Scott discussed different perspectives on Catholic education and values as being central to Saint Stephen’s mission. He felt students’ reflections on their place and relationship with the “Truth or big idea” was a way to engage them in dialogue while teaching in light of the Catholic faith. He recognized student perspective as a critical element in learning through discovery, and being comfortable exploring personal

relationships between opinions and Truth is “what being a Catholic is – a universal understanding.” In Religion, however, Scott felt bounded by the resources and curriculum provided by the church, but stated, “there should always be a distinction between what the Catholic Church teaches and what are some other ideas.” Therefore, he explored these relational elements when teaching English and social studies. He recognized the various religious differences among the students, and aimed to teach from the point of view of history. In his teaching, Scott modeled the perspective of the time. For example, in a lesson on the French revolution, he asked the students their opinions on whether or not the killings of the nobility were justified. He acknowledged that some of his colleagues would be insulted at the question prompt - ‘you’re killing priests and nuns!’ - but he encouraged students to wrestle with their own perspectives. “One of the ways I talk about it,” stated Scott, “I’m a Catholic here at this time, I don’t know if I would have been – in French revolutionary time.”

Mary expressed concern that more technology might have a negative influence on student relationships, specifically with communication. She emphasized that one of her classes, French, depended on authentic communication with people. “Are we really rendering a service in a communicative discipline by sending them in their rooms with more screen time? Aren’t we seeking to communicate with people?” However, at the onset of increased classroom technology, I observed quite the opposite. Mary immediately embraced the challenge of understanding how technology could increase student relationships through more authentic communication and collaboration opportunities. She regularly used digital collaboration tools and encouraged students to

explore content videos to hear different dialects. Additionally, Mary focused on students creating their own videos to demonstrate learning, and these were always done in groups. She described that students not only learned more about their personal learning preferences, but also in creating videos together learned more about their peers' learning styles.

Following the implementation of one-to-one in the middle school classrooms, Sharon, Mary, and Johanna all expressed a similar opinion. One unexpected change was the shift in classroom roles; they all felt "like the student" on more occasions than before the increase of digital tools. Sharon expressed that she felt the relationships she was building with the students were different. Often she did not know the answer to a technology problem, but the students were quick to figure out a solution. She said that she was surprised at "how okay I am with that," and she was quickly getting past the fear of not always being in control. I also observed this happening in Mary's class when there was an issue with sharing student made videos. Mary appreciated this change; she loved learning with students, as opposed to being considered the only expert in the room.

Student Growth

Student growth and development was a common message in Saint Stephen's mission statement, values, and iconography. When I walked through the doors, I was presented with signs and symbols that represented responsibility, respect, and academic excellence. Throughout the data, in both interview and observation, I found similar evidence of commitment to student growth, including personal, academic, and spiritual.

As technology was integrated increasingly into instruction, much of the data pointed toward student growth in and awareness of digital citizenship. When Johanna was asked directly how technology might support or challenge the school philosophy or her teaching, she stated, “I keep coming back to digital citizenship.” She recognized technology as a way to help students grow from a more global perspective, but embraced the small size of Saint Stephen’s and the ability to “keep a lid on things.”

We can keep the world a little bit at bay. I think we’ve lost that with tech. How do we keep control of that? How do we keep them from cyber bullying? That could be a threat to the community that we are trying to build here.

Johanna took an active role in promoting student growth through responsible decision making in a digital world. She led the middle school in a digital citizenship day, and regularly asked students to reflect on their digital actions. Johanna admitted that she needed to do that because, “if I’m asking students to grow responsibly in a digital world, I need to model that. I need to occasionally unplug.”

Mary brought up the issue of a digital footprint. She questioned how to talk to students about the idea of forever. She explained that through confession, God forgives, but in a digital world there is less forgiveness. The issue of ‘forever’ was new to her, and she did not know how to convey that message to students.

In the second year of the study Sharon, Mary, and Johanna grappled with the issue of student responsibility. Now that the middle school was one-to-one, they wanted students to be able to personalize their individual tablets but were concerned about appropriateness. They all recognized that for students to grow in maturity and

responsibility, they needed to let them “loose” a little with the devices. After a 20 minute conversation about potential new policies, these teachers brought the conversation back around to grounding any rules in their already establish community guidelines. This was one of the first observed moments that they did not consider technology separate from their traditional practice; it was now part of the school and decisions regarding technology should fall under the same guidelines. “We already encourage and embrace respect,” stated Johanna, “that shouldn’t be any different just because we are talking about a tablet.”

Traditional or Twenty-First Century Teaching

Data revealed many references to “traditional” and “twenty-first century,” and these were terms that I did not use in the interview protocol. Although not explicitly stated in the Saint Stephen’s mission statement, Scott and Johanna repeatedly referenced a general approach to teaching and curriculum as traditional. When prompted for more explanation, they both referred to textbooks, desks in rows, and paper and pencil note taking. In considering the integration of more technology, Scott did not see Religion as a class in which he would use technology. There was a standard curriculum and he felt that bringing in digital resources would go against what was expected from him as a Religion teacher. However, in English and social studies, he was excited about the new opportunities for learning that technology would allow for, “blogging, video, just different ways for students to write and express themselves.”

Johanna demonstrated similar feelings when she compared her two subjects areas, math and science. In math, she did not see technology supporting her teaching or student

learning. “[In math] I’m a very traditional teacher. Paper and pencil – by the book.” However, when she spoke about science, she recognized technology as a way for students to be more engaged with science content, either through simulations, data manipulation, or exposure to different media. Johanna continued to emphasize her overall traditional approach to teaching though; she referenced lecture as an effective way for students to learn content. She was confident that her instructional methods aligned with school academic goals and values and was nervous about the “twenty-first century push” for student involvement and voice. “Show me the evidence. The jury is out on all this stuff. Let’s be careful about not just going with the fad. Let’s make sure we are improving learning outcomes. Not just going with the latest things.”

Scott speculated about perceived tensions among teachers when thinking about using more technology. He specifically referenced a “new” mission statement – one that focused on twenty-first century learning.

I guess one of the tensions we've found is, or at least this is more of my perspective, one of the tensions is the way the mission statement is worded is it talks about the best of traditional, and then it talks about twenty-first century skills, and I don't know what the best of traditional education represents.

He believed that twenty-first century education should incorporate the best of traditional education, but questioned whether Catholic education could be outside of what was considered traditional. While he hoped that it could, he could not envision what it would look like in the classroom.

Interview data from Sharon also revealed comparisons between traditional and twenty-first century teaching, but it was in observation that the contrast was most evident. During the first year of observations, Sharon's classroom was set up with desks in a V-formation facing the front of the classroom. At the front was a chalkboard, but the focal point was the prayer table (with candles and a Bible) and a Crucifix hanging on the wall. Often, there was Scripture written on the board. After new technologies were introduced, Sharon rearranged her classroom to face the sidewall; the desks were still in a V-formation, but they now faced a large television screen. The prayer table was in the back corner, and the Crucifix was no longer visible when students looked forward. I engaged in a conversation with Sharon about the change, and she admitted that she was struggling with the balance between wanting students to see or experience the new technology, but maintaining the Catholic culture as the "heart" of the room. I asked her which was more important to her educational goals, and the next week the room was back to its traditional set up.

Discussion

I looked across the four themes of education of the whole person, perspectives on relationships, student growth, and twentieth or twenty-first century teaching, and data revealed a strong presence of the Catholic school environment. I used the suggested school frameworks outlined by Miller (2006) and Cook and Simmonds' (2011) as coding structures, and evidence pointed to an unmistakable Catholic educational experience. Collectively, teachers' classroom practices and environments emulated inspiration and guidance in the spirit of Catholicism. The theme of relationships further revealed that

teachers encouraged student connections to support an understanding of self and culture. Furthermore, at the onset of increased classroom technologies, teachers experienced a relationship change; they were not always the knowledge experts and began to see students as facilitators for discovery.

Ertmer and Ottenbreit-Leftwich (2010) suggested four key dimensions of change when implementing technology for learning, (1) knowledge and skills, (2) self-efficacy, (3) pedagogical beliefs, and (4) school/subject culture. Based on Ertmer and Ottenbriet-Leftwich's (2010) descriptions, it was apparent that teachers experienced change in the first three dimensions, and in this regard I perceived balance among Saint Stephen's educational goals, twenty-first century teaching and learning goals, and technology integration. That is, during a time period of change, the overarching goals of Catholic education were preserved. However, data were not as clear about the forth dimension, school/subject culture. While teachers regarded technology integration as a natural way to enhance Saint Stephen's educational program, interview and observation data did not support this opinion across all content areas, especially when the same teacher taught two classes. For example, Scott embraced technology in his English and social studies classes, but had trouble envisioning its usefulness in Religion. He was held to specific guidelines within the domains of the content, and the opportunities he saw for technology in social studies, for example, did not apply to Religion. Similarly, although Mary initially expressed excitement about technology potentially bridging a gap between students' religious practices and other interests, it was in her French classes that she was most often observed using digital tools to enhance students' educational experiences.

At the turn of the century, Boland (2000) outlined a blueprint for Catholic schools for a successful transition into twenty-first century teaching and learning. I drew from Boland's suggestions and recognized that teachers at Saint Stephen's incorporated purpose and reality by integrating a traditional school mission with academic and technological advances. However, this was not evident in Religion class, a core component of the academic program. Boland suggested moving away from the practice of memorization to more student examination of faith and personal application to life in the Religion class. Sharon facilitated student reflection and relationship building in Religion, but that was absent of technology. Scott encouraged high levels of personal inquiry, but not in Religion. Furthermore, he questioned the place of Religion outside of what was considered traditional. These data led to an emergent question; is it necessary to use technology in every class? In all other classes, as opposed to Religion, teachers at Saint Stephen's were enhancing the academic experiences of the students while upholding the core values of the school. Furthermore, when embedding Religion in other content areas, teachers collectively agreed that emphasizing digital citizenship through the lens of Catholic responsibility was fitting. As Scott stated, twenty-first century education should incorporate the best of traditional education; what if Religion *is* taught best in the traditional model?

Future Research

Although case study was appropriate for this inquiry, limiting the scope of the research to teachers as cases from one school was the primary limitation but revealed notable areas for future research. White (2012) and Nuzzi et al. (2012) discussed

similarities and differences between different types of Catholic schools. Saint Stephen's was a Diocesan school under the authority of a parish, while different Catholic schools could be classified as Single-Parish, Inter-Parish, Private, or Unaffiliated (Nuzzi et al., 2012; J. J. White, 2012). To gain a deeper understanding of the balance between Catholic educational goals, teaching practices, and technology integration, it would be beneficial to look across different types of Catholic schools through an embedded case study; that is, explore the opinions, actions, and practices of each school through the perspectives of the community.

A key finding of balance among Saint Stephen's educational goals, twenty-first century teaching and learning goals, and technology integration, except in Religion class, also suggested the need for further examination of Religion curriculum and teachers of Religion. The focus of this study incorporated individual teacher context. Perhaps the context of Religion class will serve as a better reference for understanding the balance between Catholic education, technology, and practice, whereas Religion is the foundation of Catholic education.

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CHAPTER SEVEN

Conclusion

The purpose of my research was to explore the teaching practices of Catholic middle level educators in support of twenty-first century education. I considered the broader goals of twenty-first century education, shifting teaching practices to support twenty-first century outcomes, technology integration as a model to enhance twenty-first century teaching and learning, and how these aspects contribute to Catholic education in the twenty-first century. I further aimed to explore and understand the balance between necessary shifts in instruction that do support twenty-first century teaching and learning with Catholic educational values and goals. In addition to addressing the significant gap in research on teaching practices and technology integration in Catholic schools, this study directly responds to the call from Catholic leaders, researchers, and educators for specific research within the Catholic school context that focuses on the intersection of Catholic schools' values with instruction.

Using multiple-case study as a research design, I addressed the following questions in three articles, chapters four, five, and six respectively:

Article One: Teaching Practices to Support Twenty-First Century Education in Catholic Middle Level Classrooms

1. How do middle level Catholic school teachers interpret and apply twenty-first century teaching practices?
2. How do contextual factors influence teachers' instructional practices as they align to twenty-first century educational goals?

Article Two: The Influence of Technology Integration on Middle Level Catholic Teachers' Instructional Practices

3. How are Catholic educators integrating technology in their teaching?
4. How does the use of technology influence teachers' instructional practices?

Article Three: Exploring the Balance Between Catholic Schools' Educational Goals, Teaching Practices, and Technology Integration

5. How do middle level Catholic educators perceive their teaching practices align to Catholic educational goals?
6. How does technology support middle level Catholic educators' instructional goals and practices as they relate Catholic educational goals?
7. How does technology challenge middle level Catholic educators' instructional goals and practices as they relate Catholic educational goals?

Implications

A primary challenge of Catholic education in the twenty-first century is the trend of declining enrollment (Nuzzi et al., 2012). Catholic schools are in a position of survival, and to remain relevant and competitive among the many different schooling options, they must set themselves apart from other schools by offering unique learning opportunities while enhancing Catholic educational values. Many Catholic leaders are attempting to re-shape Catholic school learning for the twenty-first century by integrating their vision with the reality of a rapidly changing technological society (Boland, 2000; Kennedy, 2013; Nuzzi et al., 2012). The advancing dynamic landscape of the twenty-first century requires educators to shift their traditional models of content delivery toward

an emphasis on challenge-based, active, collaborative, and student-driven learning environments.

The findings and discussions presented in chapters four, five, and six focused on teachers' interpretations of twenty-first century education, classroom practice, technology integration, and balance between twenty-first century instruction and supporting Catholic educational goals. Addressing the call for increased attention on Catholic educational opportunities in the twenty-first century, what follows is a description of implications related to Catholic educators and decision makers, and directions for future research.

Educators and Decision Makers. With an emphasis on teaching practices, three principal implications emerged from this study: content, collaboration, and learning partnerships.

Content. More attention needs to be placed on subject culture within a school. Data pointed to content area as a confounding aspect when incorporating twenty-first century instructional practices and integrating technology. In one case, a teacher felt pressured by content driven standards and did not indicate a need or desire to change teaching practices to support twenty-first century education. Furthermore, she did not believe technology could be useful for teaching or learning. However, it was clear that this was uniquely based on the specific content; this same teacher demonstrated twenty-first century teaching practices and consistent technology integration in a different class.

Data suggested that Religion was another content area where teachers indicated low levels of twenty-first century teaching or technology integration. Teachers referred to Catholic curriculum standards and expectations as reasons for not incorporating

twenty-first century instructional strategies, as well as questioned the need for technology when teaching Religion. Religion is the core of Catholic education, and data highlighted that teaching religious values was emphasized across content areas. However, in the context of a class, there was more emphasis on remembering, and less on analyzing or evaluating. Boland (2000) suggested that in the twenty-first century the teaching of Religion should be focused on thinking, questioning, and understanding how the tenets of faith apply to students' lives; should encourage discussion and debate; and should accentuate practical applications. Technology has the ability to help increase collaboration, expose students to more information, and integrate in and out of school lives. By bringing technology to the Religion classroom, there are opportunities for teachers and students to approach Religion content through a holistic lens that encourages students to reflect on the role of technology in relation to their spiritual lives. The reluctance to rethink teaching practices and integrate technology in a cross-disciplinary regard, especially in Religion, stemmed from the combination of personal options of content and pressure to ensure adherence to content driven standards. Zukowski (2012) recommended that not only teachers focus on integrating technology, but Catholic administrators and decision makers also find ways to teach, learn, and support educators and students to enhance the growing digital learning culture.

Collaboration. Another area of teacher practice that needs additional attention is the level of collaboration in teacher learning. Data did not suggest knowledge or practice of collaboration with other educators outside of specific schools. Engaging in professional growth and leadership is an essential behavior and practice for educators to

effectively teach in a connected, digital society (“ISTE Standards for Teachers”, 2014). Furthermore, collaboration and participation in learning communities will enhance individual learning and help teachers evolve in practice. Although all teachers were participants in professional development provided by the university, and a few cases demonstrated an interest in professional growth through conference attendance followed by in-school dissemination, teacher learning should not, and is not, constrained by space or time. While face-to-face learning proved beneficial to these teachers, technology allows for increased access to additional collaborative teacher growth and development opportunities through, for example, webinars, podcasts, and social media. Teachers are models for student learning, and it is essential to demonstrate collaborative learning to enhance education. In addition to teacher practice, increased collaboration has implications for Catholic school leaders and policy makers. In this study, there was little evidence of collaboration among teachers with other Catholic or private schools. Furthermore, conversations regarding curriculum policy or standards were individualized to the respective schools. Nuzzi et al. (2012) proposed that to preserve and strengthen Catholic education, collaboration is needed among all participants in the school sector. In order to promote a shared vision for Catholic education in the twenty-first century, school-level collaboration emerges as an essential component for success.

Learning Partnerships. The majority of teachers valued the Catholic principle of education of the whole person, and demonstrated elements of supporting practices in their teaching. Data across the three research inquiries revealed this primarily through opinions on relationship building. However, emphasis on relationships focused on

student-student or student-God. With the exception of two teaches, little evidence pointed toward rethinking teacher-student relationships. Fullan and Langworthy (2014) suggested that increased digital access enables a natural development of new learning relationships, or partnerships, between teachers and students. However, as demonstrated in this study, this natural development only occurred in two cases. For example, Mary recognized the importance of connecting learning to students' interests, thus allowing for a shift in teaching and learning roles. She was not held back by any perceived expectations of the school, and redefined instruction to allow for teacher-student partnerships in learning tasks.

Catholic decision makers are calling for more innovation in teaching, and, as evidenced in the data, technology integration is not necessarily promoting transformative teaching. Instead of focusing on technology as a new pedagogy, Mary approached increased educational technology as an opportunity to connect with students to rethink her teaching and student learning. As Catholic educators look to shift teaching to support goals of twenty-first century education, technology can support a collaborative and communicative learning environment, but teachers need to allow space for teacher-student learning partnerships.

Future Research. The specific request from Catholic leaders, researchers, and educators for research within the Catholic school context that focuses on the educational opportunities and the intersection of Catholic schools' religious values with instruction suggests a need for continued research in this area. Although this study provides a

perspective on Catholic education in the twenty-first century, further research should be conducted to add to the conversations around the complexities of Catholic education.

There are similarities and differences between different types of Catholic schools (White, 2012; Nuzzi et al., 2012). Therefore, to gain a broader perspective of the balance between Catholic educational goals, teaching practices, and technology integration, further research should include an inquiry that focuses on school-level aspects; for example, leadership structures, parish and community involvement, policies, and Catholic traditions.

A key finding of limited teaching transformation or technology integration in Religion class suggests another area of further research. Focusing on Religion as the case with teachers as embedded units of analysis might illuminate contextual understandings of how Religion balances with twenty-first century education.

Finally, one key perspective missing from the literature in understanding Catholic education in the twenty-first century is that of the students. In the twenty-first century, teachers are encouraged to support dynamic learning environments that foster teacher-student learning partnerships. Therefore, research also needs to model the inclusion of student perspective and voice to provide a holistic understanding of Catholic teaching and learning in the twenty-first century for the overall promotion of a shared vision for Catholic education.

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APPENDIX A: Teacher Consent

Informed Consent

Title of Research Project: The Learning and Engaging Adolescents Project
Principal Investigator: Penny Bishop, EdD
Sponsor: The Rich E and Deborah L Tarrant Foundation

You are being invited to take part in this research study because you work at a middle school in Vermont. This study is being conducted by the University of Vermont.

We encourage you to ask questions and take the opportunity to discuss the study with anybody you think can help you make this decision.

Why is This Research Study Being Conducted?

We are conducting this study in order to understand how well educational technology is meeting the needs of the students.

How Many People Will Take Part In The Study?

Approximately 350 students, 25 teachers and 4 administrators will be part of the research each year for three years.

What Is Involved In The Study?

You will be asked to contribute your perspective on how well educational technology meets the students' learning needs. You will be asked to take part in a face-to-face interview twice annually that will last between 30-60 minutes. Each interview will take place at school in a private space. The interview sessions will be audio-recorded for transcription purposes only.

What Are The Risks Of The Study?

There is a risk that confidential information might be accidentally disclosed; however, professional standards for protecting confidential information will be followed to minimize any risk.

What Are The Benefits of Participating In The Study?

Benefits to teachers include the opportunity to be contemplative about their practice. Additionally, by taking part in this research study, you may help us learn new things that may help others in the future.

What Other Options Are There?

Teachers and administrators may continue to work at their school regardless of whether or not they participate in this research study.

Are There Any Costs?

There are no costs to participate in the research study.

What Is the Compensation?

There is no compensation for participating in the research.

Can You Withdraw From This Study?

You have the option to end your participation in the interview and study at any time, without question.

What About Confidentiality?

The conversations will be audio-recorded and transcribed, and the files and transcripts will remain in our locked offices in order to ensure confidentiality. We may ask you to draw a picture or use a digital camera to show what you think about technology and learning. After the completion of our study, we may publish our research in an article or book. In order to maintain privacy, nothing you say will be personally identifiable; all names of students, teachers and administrators will be replaced with pseudonyms.

We will not publish any personally identifiable photos, drawings, or information of any kind. At the completion of the research, all personally identifiable files and other data will be destroyed. Although you may be known as an educator at the school, your participation in the research will remain confidential.

Upon request representatives from the Institutional Review Board at the University of Vermont will be granted access to your research record to verify research procedures and/or data.

Contact Information

You may contact John Downes, the UVM researcher overseeing the study, at (802) 598-1749 for more information about this study. If you have any questions about your rights as a participant in a research project or for more information on how to proceed should you believe that you have been injured as a result of your participation in this study you should contact Nancy Stalaker, the Director of the Research Protections Office at the University of Vermont at 802-656-5040.

Statement of Consent

You have been given and have read or have had read to you a summary of this research study. Should you have any further questions about the research, you may contact the person conducting the study at the address and telephone number given below. Your participation is voluntary and you may refuse to participate or withdraw at any time without penalty or prejudice.

You agree to participate in this study and you understand that you will receive a signed copy of this form.

Signature of Subject

Date

This form is valid only if the Committees on Human Research's current stamp of approval is shown below.

Name of Subject Printed

Signature of Principal Investigator or Designee

Date

Name of Principal Investigator or Designee Printed

Name of Principal Investigator: Penny Bishop, Ed.D.
Address: Education Department, UVM, 410 Waterman Building, Burlington VT 05405
Telephone Number: (802) 656-9641

Committee on Human Research
Approved Through 12-17-14
CHRBS # 07-139

APPENDIX B: Interview Protocol

Teacher Interview Protocol

Context:

1. Please tell me about how you came to be a teacher.
 - a. Background
 - b. Educational Background
2. In general, how do you feel about using technology?
 - a. Personal Use
 - b. Teaching (planning, classroom teaching, productivity)
 - c. Other?

Desired Outcomes

3. What skills and/or learning outcomes do you feel students should know upon their graduation from this school?
 - a. Education
 - b. College readiness
 - c. Career readiness
 - d. Personal development
4. Of the ones that you mentioned, which do you feel you are personally responsible for?
5. How are you preparing students with the skills and/or learning outcomes that you described?

Technology Use

6. Access
 - a. What kinds of technology do you and your students have access to in your classroom?
7. Use
 - a. How do your students use available technologies in your classroom?
 - b. How do your students use technologies outside of school?

8. Benefits and Hindrances of Technology Integration to Learning (including learning that is personalized, relevant, authentic, active)
 - a. What are the benefits for your students in using technology for academic work?
 - b. How does technology help or hinder student learning?
 - c. How, if at all, has technology changed student learning in your classroom?

9. Challenges
 - a. What are the challenges for your students in using technology for academic work?

10. Teaching Example
 - a. Think about one specific activity or lesson in which you and your students used technology.
 - b. Describe the content or process of the lesson
 - c. Describe the students (subject and grade)
 - d. Describe the student learning goals/outcomes
 - e. What technologies did you and your students use?
 - f. How and why do the particular technologies used in this lesson/project “fit” the content/process goals?
 - g. How and why do the particular technologies used in this lesson/project “fit” the instructional strategies you used?
 - h. How and why do the learning goals, instructional strategies, and technologies used all fit together in this lesson/project?
 - i. What changes, if any, would you make to this lesson?
 - i. why?
 - ii. would you replicate it?
 - j. Do you consider this lesson successful?
 - i. Why or why not?

Pedagogical Impact

11. In general, how has the use of technology influenced your teaching? (including learning that is personalized, relevant, authentic, active)
 - a. Personal use of technology
 - b. Student use of technology
 - c. The way you think about teaching

d. Your teaching practice

12. Benefits and Hindrances of Technology Integration to Teaching

a. What are the benefits to your teaching from integrating technology?

b. What are the challenges to your teaching from integrating technology?

Values

13. What do you value in education?

14. What do you value as a teacher?

15. In your own words, what is your school's mission?

a. Is there a school philosophy?

i. If yes, how would you describe that philosophy?

b. Are there school values?

i. If yes, how would you describe those values?

16. In what ways, if any, does your teaching enhance the mission, philosophy or values of this school?

17. In what ways, if any, do you feel your teaching is enhanced by the mission, philosophy or values of this school?

18. In what ways, if any, does your teaching reflect the mission, philosophy or values of this school?

19. In what ways, if any, do you feel your teaching is restricted by the mission, philosophy or values of this school?

20. In what ways, if any, do you feel technology integration has either enhanced, or challenged, your educational values?

a. The school's educational values?

21. Do you have any additional comments?

22. At this time, do you have any questions for me?

23. What else should I know if I want to understand your practice regarding... (e.g. student engagement, technology integration, student centered learning, intersection of school and digital age teaching values)?

Thank you for taking the time to participate in this interview. If you have any additional comments or questions please feel free to contact me.

APPENDIX C: Observation Protocol

Teacher:

Date:

Grade Level:

Subject:

Primary Learning Goals/Objectives (If stated/posted):

Curriculum Topic(s) (Content)	Instructional Strategies/Learning Activities	Technologies

Additional Notes:

APPENDIX D: Survey

1. What is your age?
 - a. 20-29
 - b. 30-39
 - c. 40-49
 - d. 50+
2. What is your gender?
 - a. Female
 - b. Male
3. How many years of experience do you have working in the field in education?
 - a. Less than five years
 - b. Five to nine years
 - c. Ten to twenty years
 - d. More than twenty years
4. What subject area(s) are you primarily responsible for teaching? Check all that apply.
 - a. Science
 - b. Math
 - c. English/Language Arts
 - d. Social Studies/History
 - e. Educational Technology
 - f. World Languages
 - g. Art
 - h. Physical Education
 - i. Family Consumer Science
 - j. Design and Technology
 - k. Health
 - l. Library/Media
 - m. Music
 - n. Speech and Language Pathologist
 - o. English Language Learner Specialist
 - p. Special Education
 - q. Other (please specify)
5. Students that you work with are primarily in which grade(s)? Check all that apply.
 - a. Pre-K
 - b. K
 - c. 1
 - d. 2
 - e. 3
 - f. 4
 - g. 5
 - h. 6

- i. 7
 - j. 8
 - k. 9
 - l. 10
 - m. 11
 - n. 12
6. What types of technology do your students have access to at your school? Check all that apply.
- a. 1:1 laptops
 - b. 1:1 tablets
 - c. Classroom carts
 - d. Classroom desktops
 - e. Interactive whiteboard
 - f. Other
7. Do you have a Middle Level Endorsement?
- a. Yes
 - b. No
8. Which of the following professional development activities have you been a part of with an affiliate from the Tarrant Institute for Innovative Education? Check all that apply.
- a. Professional development at your school
 - b. Summer professional development
 - c. Middle Grades Institute
 - d. Other (Tech Tips, webinars, etc.)
9. Please list any other technology related professional development in which you have participated.
- a. Fill in the blank
10. Which ways have you (and/or a team) shared work related to the Tarrant Institute for Innovative Education partnership with the broader educational community? Check all that apply.
- a. Professional conference presentation(s)
 - b. Board presentation(s)
 - c. District presentation(s)
 - d. Community presentation(s)
 - e. Print Publication
 - f. Web publication
 - g. Online presence
 - h. Social media
 - i. Other (please specify)

Question #1

I use different technology systems unique to my grade level or content area (e.g., online courseware, Moodle, WAN/LAN, interactive online curriculum tools) to support student success and innovation in class.

<input type="radio"/> 0 Never	<input type="radio"/> 1 At least once a year	<input type="radio"/> 2 At least once a semester	<input type="radio"/> 3 At least once a month	<input type="radio"/> 4 A few times a month	<input type="radio"/> 5 At least once a week	<input type="radio"/> 6 A few times a week	<input type="radio"/> 7 Daily
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Question #2

My students apply their classroom content learning to **real-world problems** within the local or global community using the **digital tools and resources** at our disposal.

<input type="radio"/> 0 Never	<input type="radio"/> 1 At least once a year	<input type="radio"/> 2 At least once a semester	<input type="radio"/> 3 At least once a month	<input type="radio"/> 4 A few times a month	<input type="radio"/> 5 At least once a week	<input type="radio"/> 6 A few times a week	<input type="radio"/> 7 Daily
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Question #3

I participate in **local and global learning communities** to explore creative applications of technology toward improving student learning.

<input type="radio"/> 0 Never	<input type="radio"/> 1 At least once a year	<input type="radio"/> 2 At least once a semester	<input type="radio"/> 3 At least once a month	<input type="radio"/> 4 A few times a month	<input type="radio"/> 5 At least once a week	<input type="radio"/> 6 A few times a week	<input type="radio"/> 7 Daily
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Question #4

My students and I use the **digital tools and resources** (e.g., interactive whiteboard, digital student response system, online tutorials) primarily to supplement the curriculum and reinforce specific **content standards**.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #5

I assign web-based projects (e.g., web collaborations, WebQuests) to my students that emphasize **complex thinking strategies** (e.g., problem-solving, decision-making, experimental inquiry) aligned to the **content standards**.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #6

Students in my classroom use the **digital tools and resources** to create web-based (e.g., web posters, student blogs or wikis, basic webpages) or multimedia presentations (e.g., PowerPoint) that showcase **digitally** their research (i.e., information gathering) on topics that I assign.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #7

My students propose innovative ways to use our school's advanced **digital tools** (e.g., digital media authoring tools, graphics programs, probeware with GPS systems) and **resources** (e.g., publishing software, media production software, advanced web design software) to address challenges/issues affecting their local and global communities.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #8

I consider how my students will apply what they have learned in class to the world they live when planning instruction and assessment strategies.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #9

I advocate for the use of different **assistive technologies** on my campus that are available to meet the diverse demands of special needs students.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #10

My students use all forms of the most advanced **digital tools** (e.g., digital media authoring tools, graphics programs, probeware with GPS systems, handheld devices) and **resources** (e.g., publishing software, media production software, advanced web design software) to pursue collaborative problem-solving opportunities surrounding issues of personal and/or social importance.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #11

I model for my students the safe and legal use of **digital tools** and **resources** while I am delivering content and/or reinforcing their understanding of pertinent concepts using multimedia resources (e.g., PowerPoint, Keynote), web-based tools (e.g., Google Presentations), or an interactive whiteboard.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #12

My students use the **digital tools and resources** in my classroom primarily to increase their content understanding (e.g., digital flipcharts, simulations) or to improve their basic math and literacy skills (e.g., online tutorials, content-specific software).

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #13

I offer students learning activities that emphasize the use of **digital tools and resources** to solve "real-world" problems or issues.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #14

Problem-based learning occurs in my classroom because it allows students to use the classroom **digital tools and resources** for higher-order thinking (e.g., analyzing, evaluating, creating) and personal inquiry.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #15

I rely heavily on my students' questions and previous experiences when designing learning activities that address the content that I teach.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #16

I promote the effective use of **digital tools and resources** on my campus and within my professional community and actively develop the technology skills of others.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #17

Students' use of **information and inquiry skills** to solve problems of personal relevance influences the types of instructional materials used in my classroom.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #18

I model and facilitate the effective use of current and emerging **digital tools and resources** (e.g., streaming media, wikis, podcasting) to support teaching and learning in my classroom.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #19

My students participate in collaborative projects (e.g., Jason Project, GlobalSchoolNet) involving face-to-face and/or virtual environments with students of other cultures that address current problems, issues, and/or themes.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #20

I employ **learner-centered strategies** (e.g., communities of inquiry, learning stations/centers) to address the diverse needs of all students using developmentally-appropriate **digital tools and resources**.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #21

I prefer using standards-based instructional units and related student learning experiences recommended by colleagues that emphasize **innovative thinking**, student use of **digital tools and resources**, and student relevancy to the real world.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #22

I provide multiple and varied **formative and summative assessment opportunities** that encourage students to "showcase" their content understanding in **nontraditional ways**.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #23

My students collaborate with me in setting both group and individual academic goals that provide opportunities for them to direct their own learning aligned to the **content standards**.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #24

My students use **digital tools and resources** for research purposes (e.g., data collection, online questionnaires, Internet research) that require them to investigate an issue/problem, take a position, make decisions, and/or seek out a solution.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #25

My students use the classroom **digital tools and resources** to engage in relevant, challenging, and self-directed learning experiences that address the **content standards**.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #26

My students use the available **digital tools and resources** for (1) collaboration with others, (2) publishing, (3) communication, and (4) research to solve issues and problems of personal interest that address specific **content standards**.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #27

My students identify important real world issues or problems (e.g., environmental pollution, elections, health awareness), then use **collaborative tools** and human resources beyond the school building (e.g., partnerships with business professionals, community groups) to solve them.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #28

I use different digital media and formats (e.g, blogs, online newsletters, online lesson plans, podcasting, digital documents) to communicate information effectively to students, parents, and peers.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #29

I use the digital tools and resources in my classroom to promote student creativity and innovative thinking (e.g., thinking outside the box, exploring multiple solutions).

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #30

Our classroom's digital tools and resources are used exclusively for classroom management and professional communication (e.g., accessing the Internet, communicating with colleagues or parents, grading student work, and/or planning instructional activities).

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #31

I seek outside help with designing **student-centered performance assessments** using the available **digital tools and resources** that involve students transferring what they have learned to a real world context.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #32

The **digital tools and resources** in my classroom are used by me during the instructional day and **not** by my students.

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #33

I design and/or implement web-based projects (e.g., WebQuests, web collaborations) in my classroom that emphasize the higher levels of student cognition (e.g., analyzing, evaluating, creating).

<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7
Never	At least once a year	At least once a semester	At least once a month	A few times a month	At least once a week	A few times a week	Daily

Question #34

I engage students in learning activities that require them to analyze information, think creatively, make predictions, and/or draw conclusions using the **digital tools** (e.g., interactive whiteboard, digital student response system) and **resources** (e.g., Inspiration/Kidspiration, Excel, InspireData) available in my classroom.

<input type="radio"/> 0 Never	<input type="radio"/> 1 At least once a year	<input type="radio"/> 2 At least once a semester	<input type="radio"/> 3 At least once a month	<input type="radio"/> 4 A few times a month	<input type="radio"/> 5 At least once a week	<input type="radio"/> 6 A few times a week	<input type="radio"/> 7 Daily
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Question #35

My students model the "correct and careful" (e.g., ethical usage, proper digital etiquette, protecting their personal information) use of **digital resources** and are aware of the consequences regarding their misuse.

<input type="radio"/> 0 Never	<input type="radio"/> 1 At least once a year	<input type="radio"/> 2 At least once a semester	<input type="radio"/> 3 At least once a month	<input type="radio"/> 4 A few times a month	<input type="radio"/> 5 At least once a week	<input type="radio"/> 6 A few times a week	<input type="radio"/> 7 Daily
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Question #36

I promote global awareness in my classroom by providing students with **digital opportunities** to collaborate with others of various cultures.

<input type="radio"/> 0 Never	<input type="radio"/> 1 At least once a year	<input type="radio"/> 2 At least once a semester	<input type="radio"/> 3 At least once a month	<input type="radio"/> 4 A few times a month	<input type="radio"/> 5 At least once a week	<input type="radio"/> 6 A few times a week	<input type="radio"/> 7 Daily
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Question #37

I promote, monitor, and model the ethical use of **digital information and technology** in my classroom (e.g., appropriate citing of resources, respecting copyright permissions).

<input type="radio"/> 0 Never	<input type="radio"/> 1 At least once a year	<input type="radio"/> 2 At least once a semester	<input type="radio"/> 3 At least once a month	<input type="radio"/> 4 A few times a month	<input type="radio"/> 5 At least once a week	<input type="radio"/> 6 A few times a week	<input type="radio"/> 7 Daily
----------------------------------	--	--	---	---	--	--	----------------------------------

