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Experiences and Perspectives of High School Teachers Regarding Technology Integration

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Walden University
2020

Abstract

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by

Tamara Turner

MEd, Southern Wesleyan University, 2013

BS, University of South Carolina, 2001

Project Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

A local school district adopted technology initiatives with the goal of transforming pedagogy to create 21st-Century learning experiences. The problem addressed in this study was high school teachers from 1 of the district's 4 high schools did not integrate technology in ways that transformed pedagogy and enhance students' learning experiences. The purpose of this qualitative case study was to explore teachers' perspectives of and experiences and challenges with integrating technology in transformational ways. Mishra and Koehler's technological pedagogical and content knowledge framework guided this study. The research questions were designed to understand teachers' experiences, perspectives, and challenges integrating technology in core content areas. A purposeful sample of 12 teachers, who taught social studies, science, English, and mathematics courses and integrated technology in core content, volunteered to participate in interviews. Data were analyzed through coding and theme development. The data showed that teachers had technology knowledge and experience but did not integrate technology in transformative ways, exhibited positive attitudes and beliefs towards technology integration, and faced challenges with managing student behavior. Teachers shared they need more training in integrating technology in core content, methods to teach students how to use technology and digital citizenship, and tools to monitor students' work. A position paper was drafted for district leaders to address teachers' training needs. This endeavor could contribute to positive social change when district leaders equip teachers with knowledge and skills to integrate technology in ways that transform pedagogy and classroom experiences to improve student learning.

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Dedication

This project study is dedicated to my husband, parents, sister, nieces, nephews, and son.

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I want to express my most profound appreciation to the members of my committee, Dr. Barbara Hunter, Dr. Sara Hough, and Dr. Mary Howe. My success and the completion of my dissertation would not have been possible without the support, encouragement, and nurturing of my family. Words cannot express my thanks to my husband, Derrick, my father, Robert, and my sister, Tabitha, who encouraged me to keep going when I didn't think I could. I am also grateful to many people I work with, who frequently offered words of encouragement, prayer, and support. Finally, I would like to dedicate the completion of my dissertation to my son, De'On, my nephews, Dominique and Daiden, and my nieces, Tierra, DeVayah, and D'Ajah, in the hopes that they will be inspired to dream their biggest dreams, and then go for it.

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Section 1: The Problem

Introduction

During the last decade, there has been an emergence of educational technology initiatives in several states (Tallvid, 2016). School systems are rapidly incorporating technology, as evidenced by district and statewide adoptions of initiatives such as one-to-one programs (McKnight et al., 2016). The goal of educational technology initiatives is to transform teachers' pedagogical practices to create empowering and engaging 21st-Century learning experiences for students (Schwartz & Szabo, 2018). Twenty-first learning experiences are characterized by the incorporation of the 21st-Century skills of communication, collaboration, creativity, and critical thinking – often referred to as the 4Cs (Netolicka & Simonova, 2017).

The U.S. Department of Education (2017) released a National Education Technology Plan focused on assuring that technology is used in classrooms to "enable personalized learning or experiences that are more engaging and relevant" (p. 12). However, according to Graziano, Foulger, Schmidt-Crawford, and Slykhuis (2017), technology integration into pedagogy in many classrooms is still being used for low-level instructional tasks such as drill-and-skill, writing using word processing, creating spreadsheets, and making presentations. Despite massive investments by school districts in technologies and acknowledgments that the technologies should transform classroom instruction, most classroom teachers use technologies to do what they have always done, with little to no change in pedagogy (Admiraal et al., 2017; Liu, Tsai, & Huang, 2015; Tallvid, 2016; Telese & Butler, 2015).

There is an ongoing challenge in educational reform about how teachers are to integrate technology with instruction in ways that transform their content-specific pedagogy and assist students in developing 21st-Century skills (DeCoito & Richardson, 2018; Liao, Ottenbreit-Leftweich, Karlin, Glazewski, & Brush, 2017; Matherson, Wilson, & Wright, 2014; Vasinda, Ryter, Hathcock, & Wang, 2017). These skills generally include an emphasis on problem solving through collaboration; use of technology for the creation of prototypes, products, research, presentations, and communication; and real-world applications (Blau, Peled, & Nusan, 2016; Christensen, 2015; Liao et al., 2017; Peled, Blau, & Grinberg, 2015). However, to teach these skills, the simple introduction of technology is not enough (Schwartz & Szabo, 2018). According to McCulloch, Hollebrands, Lee, Harrison, and Mutlu (2018), it not only matters that teachers integrate technology into their pedagogy, but it also matters how they integrate it.

Puentedura's model of substitution, augmentation, modification, and redefinition, the SAMR model, is used to evaluate how technology is used in pedagogy (Puentedura, 2013). SAMR creates a common language across disciplines that categorizes four different levels of classroom technology integration: substitution (S), augmentation (A), modification (M), and redefinition (R). In the substitution and augmentation levels of SAMR, teachers integrate technology in ways that enhance the pedagogy but do not transform it. In other words, technology is used for tasks and activities that could be conducted without technology.

For example, at the substitution level, a student may print out a worksheet, finish it, and pass it in. There is no functional change in teaching and learning, and the

technology is used as a substitute to perform the same task as was done before the use of the technology. Substitution tends to be teacher centered where the instructor is guiding all aspects of the learning. At the augmentation level, students may take a quiz using Google forms instead of using paper and pencil. There is some functional benefit in that paper is being saved and feedback is immediate (McKnight et al., 2016). Although augmentation starts to move along the teacher/student-centered continuum, the technology is still being used to perform a common task with no significant functional change in teaching and learning.

On the other hand, in the modification and redefinition levels of SAMR, teachers integrate technology in ways that transform the traditional pedagogy. At the transformation levels of SAMR, new pedagogical approaches and strategies are used to support students' learning, and technology is integrated into pedagogy to reach learning objectives through the 21st-Century 4Cs skills of critical thinking, collaboration, creativity, and communication (Netolicka & Simonova, 2017). For example, in modification, students can create and share writing electronically through a blog, wiki, or social network exchange. Student-centered tasks can be done individually or collaboratively, synchronously during class, or asynchronously outside of class. An example of redefinition would be if students transformed assignments into multimedia presentations where they collect, communicate, and disseminate information. Both the instructional method and learning experience are transformed. At this level, technology exists as a support for student-centered learning. Collaboration becomes necessary, and technology allows for new tasks that were previously inconceivable.

The SAMR model offers a method to assess how technology is integrated into instruction by looking at if the lesson is teacher centered or student centered. To transform pedagogy and help students develop the 4Cs, teachers must work in the higher levels of SAMR (modification and redefinition). The SAMR model provides insight into the local problem of teachers not integrating technology into content-specific pedagogy in transformative ways and is used in the local district to train teachers about technology integration and to determine how teachers are integrating the technology into their pedagogy.

The Local Problem

The problem of teachers not integrating technology into content in ways that transform pedagogy and students' learning experiences has permeated a local school district. In a recent district report of how teachers were integrating technology in their content-specific pedagogy, based on the four levels of the SAMR model, the majority of teachers reported that they were integrating technology at the substitution or augmentation levels. Few teachers reported that they were using the technology in ways that modified the pedagogy, and even fewer reported integrating technology in ways that redefined pedagogy. Furthermore, a very small percentage reported not integrating technology into their pedagogy at all. The results of the survey for this high school was representative of the results of the other three high schools surveyed. Overall, the majority of the high school teachers in the local district reported that they integrate technology in ways that enhance but do not transform pedagogy.

The expectation for teachers to integrate technology with instructional methods in ways that transform their content-specific pedagogy and students' learning experiences has been the goal in the local district since the introduction of one-to-one Chromebooks for students in Grades 9 through 12 in August 2016. The one-to-one initiative was in response to the passing of a law in May 2016 by the state's legislature that required schools to provide innovative, technology-based pedagogy for the delivery of learning. This paradigm shift requires local teachers to integrate technology into their current content-specific instruction in ways that transform their pedagogy.

According to research, professional development is a necessary element for pedagogical change, especially related to the integration of technology to enhance the learning experiences for students (Tondeur, Forkosh-Baruch, Prestridge, Albion, & Edirisinghe, 2016). Although ongoing professional development on integrating technology into pedagogy has been provided to teachers in the local setting, most teachers are still not integrating the technology in ways that transform their pedagogy. Hence, a gap from theory to practice exists in the local district. In theory, teachers should be integrating technology in ways that transform pedagogy, and professional development should be supporting their abilities to do so (Hur, Shannon, & Wolf, 2016). However, in practice, teachers are layering technology into antiquated pedagogy with little to no change in learning experiences for students, as evidenced by the results of the local school district's survey and the Future Ready (2017).

It is not understood in the local district why teachers, particularly teachers of students in Grades 9 through 12 who have access to one-to-one technology, continue to

struggle with integrating technology in ways that transform their pedagogy and students' learning experiences. Before designing more professional development to assist teachers in closing the gap between theory and practice, a need exists to understand the perspectives of teachers who are and are not integrating technology into their pedagogy in ways that transform learning for the students. Without understanding exactly how their instructional methods are or are not transforming students' learning experiences, these teachers may not be able to set achievable goals to transform their pedagogy to improve content learning for students.

Rationale

There is a need for further insights into teachers' perspectives regarding their integration of technology within new pedagogical practices to understand their use, or nonuse, of technology in teaching and learning (Heitink, Voogt, Verplanken, van Braak, & Fisser, 2016). According to Ruggiero and Mong (2015), many teachers are still struggling to integrate technology within their classrooms although recent emphasis in 21st-Century skills has pushed technology to the forefront of both pedagogy and learner experiences. Moreover, studies of classroom practices show that many teachers are still designing technology-integrated lessons for information transmission and drill-and-practice instead of for problem-solving, collaboration, and knowledge construction (Koh, Chai, Benjamin, & Hong, 2015). Furthermore, research by Tondeur, Van Braak, Ertmer, and Ottenbreit-Leftweich (2017) revealed that although the use of technology during teaching and learning is steadily increasing, teachers' perspectives might be a barrier to

their educational uses of technology. For instance, some teachers see no real need to integrate technology when traditional practices continue to work.

The results of the survey indicated that most classroom teachers integrate technology to do what they have always done, with little to no transformation of pedagogy at the higher levels of SAMR – modification and redefinition (Admiraal et al., 2017; Liu et al., 2015; Tallvid, 2016; Telese & Butler, 2015). For the local district, this problem has been ongoing. In April 2017, the district's coordinator of instructional technology shared the results of the district's technology integration self-assessment data from a 2017 Future Ready Survey, or FRS. The FRS self-assessment was completed in 2017 by classroom teachers in this district and assessed nine different areas of existing technology integration:

1. Overall readiness: The overall readiness of teachers to integrate technology and the readiness of the district to support integration;
2. Curriculum, instruction, and assessment (CIA): The integration of technology by teachers to transform content-specific curriculum, methods of instruction, and assessment;
3. Use of space and time: The way instructional time was being used by teachers for 21st-Century student-centered learning with technology, and the district's provision of spaces to support and encourage flexible, anytime, anywhere learning opportunities;

4. Infrastructure: The adequacy and availability of bandwidth and supportive infrastructure to ensure ready and consistent access to online resources for teaching and learning, privacy, safety, and security;

5. Data/Privacy: Data policies, procedures, and practices in place at the district, school, classroom, and student levels;

6. Partnerships: The presence of community engagement and outreach efforts that lead to formal and informal community connections that extend learning opportunities for students into community centers, libraries, businesses, higher education institutions, museums through apprenticeships, community service, and the use of community-based experts and resources;

7. Professional learning: Opportunities for professional growth for teachers, administrators, and other education professionals that lead to improvements in student success;

8. Budget/Resources: Strategic alignment of the district and school-level budgeting to prioritizing student learning and cost-efficiency for developing and sustaining digital learning environments; and

9. Collaborative leadership: Innovative leadership that builds the capacity of students, teachers, administrators, parents, and the community to work collaboratively toward the district's shared vision for deeper learning through the integration of 21st-Century technologies (Future Ready, 2017).

The FRS self-assessment included a Readiness Rating Score that ranged from 0 to 10 for each of the nine areas of existing technology integration assessed. The ratings were prepared by an internal group of district stakeholders that included K to 12 teachers, administrators, and parents. The two lowest ratings were for (a) CIA - the integration of technology by teachers to transform content-specific curriculum, methods of instruction, and assessment; with a score of 5, and (b) use of space and time - the way instructional time was being used by teachers for 21st-Century student-centered learning with technology, and the district's provision of spaces to support and encourage flexible, anytime, anywhere learning opportunities, with a score of 2.5.

The use of space to secure and set up the technology in a building and the use of time in terms of building and class schedules is individualized, changeable, and unique to each class and building in each district. On the other hand, curriculum, methods of instruction, and assessment are common across schools and districts in a state. Curriculum and assessment, in particular, are less individualized and changeable, whereas methods of instruction can be more dynamic, as long as they are aligned with curriculum and assessment. Therefore, the focus of this study was only the integration of instruction with technology by content area teachers as they seek ways to transform their pedagogy and to support 21st-Century student-centered learning opportunities.

This study is important given the vast implementation of technology initiatives in local and global education reform movements that require teachers to integrate technology in ways that transform their pedagogy. The success of the initiatives relies heavily on teachers' ability, perspectives, motivation, commitment, and belief systems

(Anagün, 2018). According to Anagün (2018), perspectives and behaviors work collaboratively, and teachers' perspectives have a powerful effect on their classroom pedagogy.

The purpose of this study was to explore teachers' experiences and perspectives about integrating technology into content in ways that transform pedagogy and students' learning experiences. The goal of this study, located in one district, was to explore the perspectives and experiences of one group of high school teachers in core content areas (mathematics, science, social studies, and English) who must integrate technology to transform their pedagogy and create 21st-Century learning experiences for their students. By exploring the perspectives of these teachers, there can be discussions on how these teachers can be supported as they change the learning experiences for students. Furthermore, an understanding of their perspectives may lead to professional development, designed to meet their needs, and assist them with overcoming challenges they face when choosing how to use technology with their instruction (see McCulloch et al., 2018).

Definition of Terms

21st-Century learning skills: Learning that focuses on students' interests and on developing the 4Cs skills of communication, collaboration, creativity, and critical thinking -- skills that are relevant to optimal functioning in the 21st-Century; learning processes that are knowledge-based, use information and communication technologies, highlight the student as the focus of the process, create motivation for learning, and emphasize active learning and diversity, as well as accessibility to a variety of resources

(Avidov-Ungar & Forkosh-Baruch, 2018; Kozma & Vota, 2014; Netolicka & Simonova, 2017).

One-to-one technology: A learning environment where each student and teacher has access to a personal computing device to use as a tool for academic learning (Varier et al., 2017).

Pedagogy: Methods of teaching (Farjon, Smits, & Voogt, 2019).

SAMR: A model for technology integration at different levels through substitution, augmentation, modification, and redefinition (Puentedura, 2006).

Technology integration: The integration of technology into subject-specific instruction (Szeto & Cheng, 2017).

Transformative technology integration: New approaches and strategies are used to modify and redefine students' learning, and technology is used in pedagogy to reach learning objectives through communication, collaboration, creativity, and critical thinking (Netolicka & Simonova, 2017).

Significance of the Study

This study can be significant to teachers, students, and district-level decision-makers in the local school district. The results of the study may provide insights to leaders in the local setting regarding teachers' experiences and perspectives about integrating technology into their content in ways that transform pedagogy and students' learning experiences. Furthermore, because the local district shares the same challenges with many districts across the nation, this study can also be significant to other districts, locally and nationally. Although districts are spending increasing amounts of money to

provide technology, their teachers may still be struggling to integrate technology into their instruction in a way that transforms pedagogy and learning experiences for students (Williams, 2015). Thus, the net effect is that those districts may be failing to realize the full promise of the educational technology they have invested in, and students may not be adequately prepared with the 21st-Century skills needed for jobs, higher education or advanced training, careers, service, and life. Therefore, how this local district addresses the issue of technology integration in ways that transform pedagogy could be a prototype for other districts as they evaluate their technology-driven instructional methods.

According to Xu and Chen (2016), technology integrated into content-specific instructional methods in ways that transform pedagogy benefits teachers by enhancing their effectiveness in teaching content specific areas and enhances the interactions between teachers and their students. For students, technology integration by teachers enhances students' motivation to learn, autonomy to solve problems with technology, and acquisition of 21st-Century skills needed for college, employment, careers, service, and life (Xu & Chen, 2016). Furthermore, educational authorities, both locally and nationally, may benefit by identifying ways to create professional learning communities that support the integration of technology into instruction in ways that transform pedagogy. Moreover, this study may set the stage for meaningful conversations to learn from teachers what support they need for the integration of technology into their pedagogy.

Research Questions

The local district has four high schools that implemented a one-to-one computer initiative; all students in Grades 9 through 12 received a Chromebook for educational

purposes. The district expects all high school teachers to integrate technology into their content-specific instruction in ways that transform pedagogy and learning experiences for students. However, the expectation is particularly true for teachers of core content courses, which are the courses that all students are required to complete before they can move on to the next level in their education or earn a diploma. The focus of this study was addressing the perspectives and experiences of teachers from one of the district's four high schools and representative of the standard core-content courses (social studies, science, English, and mathematics) who must transform their pedagogy to include technology integration. The research questions (RQs) guiding this study are as follows:

RQ1: What are the experiences of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy?

RQ2: What are the perspectives of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district about integrating technology to transform their pedagogy and the learning experiences of their students?

RQ3: What challenges do high school teachers in core content areas (mathematics, science, social studies, and English) in the local district encounter when integrating technology to transform their pedagogy and the learning experiences of their students?

Review of the Literature

Search Criteria

The research in this study was retrieved primarily from the Walden University Library system and Google Scholar. The following databases were accessed within Walden University's online databases: Academic Search Complete, Dissertations and Theses @ Walden University, ERIC, Google Books, LearnTechLib—The Learning and Technology Library, ProQuest Central, SAGE Journals, Science Direct, Taylor and Francis Online, and Thoreau Multi-Database Search. Additional references were located within the reviewed literature. Keywords and phrases that guided the searches included *classroom teachers*, *21st-Century learning experiences*, *classroom technology integration, pedagogy, students' learning experiences*, *TPACK*, and *transformation.* Research within 5 years of the original project study date was located, but as the years to complete the project study increased, more updated literature was found. Finally, qualitative research studies similar to this project study were reviewed to form the foundation of the methodology.

There are three main sections of this literature review that provide context for this study. In the first section, I explain the conceptual framework used to guide this study. In the second section, I present an overview of similarities and differences between the TPACK and SAMR models. In the third section, I present a critical review of the broader problem associated with the local problem addressed in the study.

Conceptual Framework

Mishra and Koehler's (2006) technological pedagogical content knowledge framework guided this study. Originally identified as TPCK, the framework was later renamed as TPACK. The framework proposes three general knowledge domains that are critical for technology integration into the teaching and learning processes:

1. Technology knowledge (TK): An ever-evolving knowledge of information technology understood broadly enough to apply it productively at work and recognize when it can assist or impede the achievement of a goal;
2. Pedagogical knowledge (PK): Teachers' deep knowledge about instructional practices or methods of teaching and learning; and
3. Content knowledge (CK): Teachers' knowledge about the subject to be learned or taught (Mishra & Koehler, 2006).

Interactions among and between the three general knowledge domains (TK, PK, and CK) result in four additional constructs (TPK, TCK, PCK, and TPACK):

1. Technological pedagogical knowledge (TPK): Knowledge of how instructional practices or methods of teaching and learning can change when technologies are integrated in particular ways;
2. Technological content knowledge (TCK): Knowledge of how technology and content influence each other;
3. Pedagogical content knowledge (PCK): Knowledge of pedagogy that applies to the teaching of specific content; and

4. Technology, pedagogy, and content knowledge (TPACK): An emergent form of knowledge that serves as the basis of effective integration of technology into teaching and learning through the simultaneous integration of TK, PK, and CK (Mishra & Koehler, 2006).

The interaction of these domains and constructs creates an understanding of the types of knowledge teachers need (in the form of technology, pedagogy, and content contexts and their interactions) to successfully integrate technology into pedagogy and content at varying levels, as described by SAMR, in ways that transform pedagogy and students' learning experiences (Koehler, Mishra, Kereluik, Shin, & Graham, 2014; Mishra & Koehler, 2006).

The TPACK framework is an adaptation of Shulman's (1986) earlier theory that effective teaching exists in the space between PK and CK resulting in PCK (Hilton, 2016). However, with the emergence of technology use in education, Mishra and Koehler (2006) argued that because most teachers organize their planning on content goals and pedagogical methods, technology integration should follow the same pattern. Integrating TK into CK in ways that transform PK requires the ability to understand and craft instructional methods that draw on all three areas simultaneously (Mishra & Koehler, 2006).

In this study, TPACK served as the conceptual framework to guide data collection and analysis on the perspectives and experiences of high school teachers in core content areas who must transform their pedagogy and students' learning experiences through the integration of technologies. Additionally, I focused on teachers' experiences,

perspectives, and challenges of integrating technology into their content-specific pedagogy at varying levels. Mishra and Koehler (2006) argued that the challenges of integrating technologies influence the instructional methods teachers use in their classrooms. Moreover, teachers are less likely to use TPACK if there is a lack of understanding of how TK can be integrated in ways that are consistent with their existing pedagogical perspectives (Mishra & Koehler, 2006). Hence, I used elements of TPACK to guide interview questions about teachers' perspectives about integrating TK into their CK to transform their PK. The four constructs of TPACK (PCK, TCK, TPCK, and TPACK) were used to analyze the results of the study.

Comparisons of TPACK and SAMR Models

Both TPACK and SAMR focus on how technology can be integrated in ways that transform pedagogy. TPACK is a generative framework based on the idea that technology cannot be considered in isolation. With TPACK, teachers start with the content (the what) and pedagogy (the how) and then determine how technology (the tools) can be layered to better improve student learning. TPACK encourages teachers to constantly consider how all three knowledge domains (TK, CK, and PK) intersect to enhance the 4Cs of 21st-Century skills (creativity, collaboration, critical thinking, and communication). TK, PK, and CK help teachers to identify the most effective ways to teach (Koehler et al., 2014; Mishra & Koehler, 2006; Walsh, 2017). According to Walsh (2017), TPACK encourages teachers to think beyond technology as an add-on and consider how it can be integrated into the content being taught and how pedagogy can be transformed when teaching with technology.

Similar to TPACK, the ultimate goal of technology integration under the SAMR model is to transform pedagogy and student learning to do things that could have never been accomplished without technology (Walsh, 2017). In contrast to TPACK, however, SAMR considers the technology in isolation from the content and pedagogy and lacks the focus on deliberately connecting technology, content, and pedagogy. According to Hilton (2016), the SAMR model focuses on each use of technology for a different purpose and at a different level. When technology integration is considered in isolation from content and pedagogy, the technology may or may not reinforce content goals and pedagogical goals.

Kirkland (2014) explained that the SAMR model provides a way for teachers to consider how technology can be used to redesign traditional ways of learning. The SAMR model is based on the theory that technology integration into classroom practices "is fabricated on the transformation or enhancement of traditional pedagogies to the use of new efficient technologies, either through the substitution, augmentation, modification or redefinition of educational tasks" (Kihoza, Zlotnikova, Bada, & Kalegele, 2016, p. 111). However, researchers have argued that both TPACK and SAMR can be used to achieve common goals using different approaches (Kihoza et al., 2016; Puentedura, 2006). Furthermore, Kihoza et al. (2016) outlined the following TPACK and SAMR construct matches as follows:

- TK-A: Augmentation is related to TK in the acknowledgment that new technologies can be integrated into pedagogy within a content area in ways that augment (A) but do not transform traditional teacher-centered practices. An

example would be if animations were embedded into a power point presentation to clarify a point.

- TPACK-R: Redefinition related to TPACK occurs when traditional teacher-centered pedagogies are completely redefined using the SAMR model characteristics to form new pedagogies. For example, a teacher-led course is transformed into a fully online course (e-learning).
- TPK-M: With modification, teachers use their knowledge of technology to modify (M) traditional teacher-centered pedagogical tasks (TPK) to student-centered learning opportunities in a specific content area. For example, students can collaborate to write a report and share it using email addresses and a google doc instead of the teacher delivering direct content using a regular power point presentation.

Additionally, the relationship between one combination of TPACK and SAMR constructs may lead to additional, and different, combinations. For example, augmentation (A) may lead to a teacher using a technology such as MS-Word to create a document, manually save it, and share it on a memory stick. Because the use of a manually saved document and memory stick still creates limitation, the teacher could use TK to move to the modification (M) level of SAMR to eliminate the limitation and significantly redefine (R) the task.

Review of the Broader Problem

The increased presence of educational technology in classrooms today has changed expectations regarding teachers' instructional methods. Over the last decade,

school systems in the United States have rapidly incorporated technology into classroom learning environments, as evidenced by the district and statewide adoptions of technology initiatives such as one-to-one programs (McKnight et al., 2016). Even though access to technology has increased, teachers ultimately decide if and how the technology is integrated into their content and pedagogy (Matherson et al., 2014). But there continues to be little evidence that teachers' access to technology has transformed their pedagogical practices to support the needs of their 21st-Century learners (Frazier, Trekles, & Spores, 2019).

The problem of teachers not integrating technology into the content in ways that transform pedagogy is not unique to the local district. Technology integration in education is considered one of the key educational challenges of the 21st-Century (Liao et al., 2017; Scherer, Tondeur, Siddiq, & Baran, 2018; Taimalu & Luik, 2019). According to Admiraal et al. (2017), when it comes to integrating technology, most classroom teachers choose activities that help them accommodate their perspectives of teaching and learning. For example, teachers with teacher-centered beliefs tend to rely on traditional teaching methods. On the other hand, teachers with constructivist, student-centered beliefs tended to diffuse student-centered teaching and technology integration at the same time. Studies report a positive relationship between technology integration and constructivist beliefs of teaching and learning. Furthermore, traditional, teacher-centered beliefs had a negative impact on technology integration (Admiraal et al., 2017).

Students' learning experiences. The skills, knowledge, and expertise students must learn to be well prepared for success are popularly referred to as 21st-Century skills.

These skills, known as the 4Cs, include creativity, communication, collaboration, and critical thinking. The use of these skills by students is believed to prepare them to engage in today's more complex social, cultural, and educational environments with multiple technologies (Tatar, Aldemir, & Niess, 2018). For example, Tatar et al. (2018) believed that the combination of multiple technologies such as two-dimensional and three-dimensional computer programs that can be integrated into content areas such as mathematics could prepare students to dynamically explore content and gain knowledge through the skills of critical thinking and creative thinking. Other researchers agree with Tatar et al., (2018). For example, Kivunja (2014b) called learning environments centered on teaching the 21st-Century skills as "the new learning paradigm" (p. 85). This new learning paradigm requires a pedagogical shift from teacher-centered instruction to student-centered learning experiences that incorporate the 4Cs (Christensen & Knezek, 2018; Heafner & Ashley, 2016).

The 4Cs represent the skills American students need to graduate with, in addition to the traditional core subject skills, to effectively contribute to the progress and prosperity of America. The 4Cs were identified by the Partnership for 21st-Century Skills (P21, 2015), an organization formed in the USA out of concern that the education system in America was not producing graduates with the skills needed to be productive citizens in the Digital Economy. The Partnership for 21st-Century Skills views all of the 4Cs as interdependent and interrelated.

Generally, critical thinking enables students to think deeply and solve non-familiar problems (Kivunja, 2015). This is important because the 21st-Century economy

is driven by technology typified by ever changing information. Therefore, training in critical thinking prepares students to be productive in a knowledge economy and reason through issues in a rational manner (Kivunja, 2014a).

Communication involves sharing thoughts, questions, ideas, and solutions. According to Kivunja (2015), interactional and transactional communication skills are essential for students' success both inside and outside of the classroom. Communication skills are among the 4Cs because students must be able to participate in communication that is verbal, non-verbal, written, audio, visual, or digital, in order to have meaningful relationships in the workplace and in life. Furthermore, the instantaneous mix of people of different cultures that has been enabled by technology has increased the need for a deeper and broader set of communication skills than in previous generations (Kivunja, 2015).

Given the extent to which technology has accentuated the confluence of experiences among diverse groups of people, collaboration can increase productivity in real 21st-Century work environments (Kivunja, 2015). According to Kivunja (2015), collaboration involves the sharing of social and cultural experiences. In classroom settings, pedagogy that includes collaboration is characterized by cooperation, consensus, and change of ideas and opinions between teacher-student and student-student (Rusdin & Ali, 2019).

Pedagogical practices that include creativity provide students with opportunities to apply ideas to produce innovative products, activities, and projects in ways that are new, useful, or add social or economic value (Kivunja, 2015; Rusdin & Ali, 2019). In

today's world of global competition, the economy is fueled by information and driven by technology. Therefore, creativity is a key skill in preparing students to be successful in the global economy (P21, 2014). The 4Cs are needed for successful study, work, and life in the 21st-Century. However, they are also a part of the new philosophical approach to teaching and students' learning experiences (Kivunja, 2015). But this new approach is not just about the 4Cs. According to Kivunja (2015), it is also about switching teaching and learning from traditional/teacher-centered to maximizing students' participation in active, student-centered experiences.

According to Kim (2018), there are two contrasting sets of adjectival terms used in the literature to define types of teaching or students' learning experiences: constructivist/student-centered and traditional/teacher centered. "Student-centered" approaches align with "constructivist" approaches in that students are the main agents of their learning. Students are actively engaged in learning instead of passively receiving information. On the other hand, "teacher-centered" approaches are aligned to "traditional" approaches based on the ideas that teaching is the transmission of knowledge from teacher to student (Kim, 2018). In this approach to learning, the teacher applies the tenets of direct instruction, as she or he explains or tells the learner what to learn and what to think. Although in certain circumstances, direct instruction can be effective, it is believed that constructivist/student-centered learning can be equally or even more, effective. Avidov-Ungar and Forkosh-Baruch (2018) argued that learning experiences that support students' preparation for new challenges posed by the 21st-Century require a change in the role of the teacher. Therefore, initiatives such as one-to-

one programs are believed to support pedagogical shifts from teacher-centered instruction to student-centered learning experiences.

Student-centered learning includes active-learning pedagogies that engage students as active participants in class activities that go beyond lecture. Examples of student-centered learning activities include cooperative groups, opportunities for self-paced engagement in activities, peer discussions, and responsiveness to individual needs (Connell, Donovan, & Chambers, 2016; Muianga, Klomsri, Tedre, & Mutimucuio, 2018). Researchers argue that the integration of educational technologies, especially in one-to-one programs, requires new student-centered pedagogies rather than substituting or producing traditional pedagogical activities (Christensen & Knezek, 2018).

Teachers must not only have technology knowledge (TK) and knowledge of how to integrate TK into pedagogy, but they must also be able to develop technology-enabled curriculum within their content. This results in "a planned set of educational activities that present new ideas in a defined context aiming to extensively improve the ability to learn" (Avidov-Ungar & Forkosh-Baruch, 2018, p. 184). In such a setting, students are encouraged to gather information, create new knowledge, and ask questions to develop higher order thinking skills (Avidov-Ungar & Forkosh-Baruch, 2018). However, to transform PK and establish these types of technology-driven activities in a successful learning environment, teachers must know about teaching a specified content through the use of educational technologies in support of the most pedagogically sound instruction (Slough & Chamblee, 2017).

Technology integration into pedagogy. Teachers are expected to integrate technology into subject-specific content in ways that transform pedagogical practices from direct teacher instruction to interactive exchanges with and among students (Avidov-Ungar & Forkosh-Baruch, 2018; Kivunja, 2014a, 2014b). In student-centered learning models, teachers play critical roles in organizing the learning environment to provide students with active, hands-on learning and authentic tasks (McKnight et al., 2016). In a study by McKnight et al. (2016), teachers that integrated technology described feeling "freed from the traditional 'stand and deliver' instructional model" (p. 206). Because technology enabled students to access levels of inquiry not otherwise available, and multiple resources, it was possible for teachers to guide, question, and facilitate students find their own answers and construct their own knowledge. Teachers in the study described a pedagogical shift from traditionally spending large amounts of time providing whole-class instruction to spending more time engaged in side-by-side coaching, one-on-one support, and providing immediate feedback to students.

These pedagogical shifts are a change from traditional learning environments. According to Wang, Hsu, Reeves, and Coster (2014), teachers have traditionally integrated technology into their pedagogy in a passive manner similar to how students might learn from textbooks or television programs. However, this approach has yielded low to no significant impact on students' development of 21st-Century skills (Wang et al., 2014). With the introduction of technology initiatives, education policy makers are now advocating for teachers to transform their pedagogical practices through the

integration of technology to support new ways of teaching and learning in the classroom (Telese & Butler, 2015).

According to Yarbro, McKnight, Elliott, Kurz, and Wardlow (2016), the power of technology to transform pedagogy occurs when its integration has an impact on learning routines, cognitive processes, problem-solving, and teacher roles. Technology integration can transform learning routines by allowing students to be engaged in the learning activities without being restricted to a physical location (Khaddage, Müller, & Flintoff, 2016). Additionally, technology supports the personal agency of learners, which, in turn, allows the learner to decide when, where, and how he or she will learn. According to Khaddage et al. (2016), technology supports synchronous collaboration through of the use of apps like Google Docs and asynchronous collaboration using social networking sites such as Twitter.

However, a number of research studies have reported that instead of integrating the technology in ways that transform pedagogy and students' learning experiences, the majority of teachers still use the technology for low-level tasks and "augmentation" of existing classroom practices (Bray & Tangney, 2017; Heafner & Ashley, 2016). To be effective in the 21st-Century, teachers must be able to transform the teaching and learning process through the integration of technology. Moreover, transforming pedagogy through the integration of technology can be challenging.

For example, Yarbro et al. (2016) studied how 65 seventh- through 10th-grade mathematics and English teachers integrated technology into their pedagogical practices. Results of the study revealed that both mathematics and English teachers most frequently

integrated technology to enhance teacher-centered direct instruction, through low-level substitution and augmentation of the information to be taught. The technology was integrated into pedagogy at the lower levels of SAMR and in ways that did not transform pedagogy or learning experiences for students. During approximately 68% of the days that technology was incorporated, it was used for teacher-centered direct instruction. Desired instructional strategies thought to support student-centered 21st-Century learning experiences such as communication, collaboration, and research, exploration, and creativity were integrated less frequently by both mathematics and English teachers.

According to Yarbro et al. (2016) the results of the study also provide insights on how specific content areas may approach technology integration differently. For example, English teachers in the study integrated technology into pedagogy for teaching the content in greater depth, which decreased the breadth of coverage. As a result, as student-centered technology integration into the pedagogy of English teachers increased, the number of content standards they were able to cover decreased. This was not observed among mathematics teachers. For mathematics teachers, technology was integrated as a way to enhance efficiency in covering more standards. Mathematics teachers were able to cover more content when technology was integrated into pedagogy. However, the results of the study by Yarbro et al. (2016) indicated that both mathematics and English teachers integrate technology into pedagogy predominantly in ways that supported teacher-centered direct instruction of content.

In contrast to the previous studies, a study by Chandra and Mills (2015) examined how teachers integrated technology into their content-specific pedagogy in ways that

transformed teaching and learning. The study sought to understand how teachers changed their pedagogy as a result of technology-driven reform. The aim of the study was to investigate how technology can trigger pedagogical shifts from teacher-centered approaches to student-centered approaches. Participants included teachers who taught core content courses (English, mathematics, science, social studies, health, physical education, and languages other than English) in a suburban high school. According to Chandra and Mills (2015), pedagogical approaches included the use of Google Earth in English classes to research and understand the settings in novels; the use of simulations in science classes to conduct experiments that would otherwise have not been possible due to workplace, health, and safety regulations; and the use of self-paced learning software in mathematics. All of the participants were described as "self-motivated" and "volunteered" to integrate the technology into their content; therefore, there was an established link between teacher beliefs, perspectives, and technology integration.

According to Avidov-Ungar and Forkosh-Baruch (2018), teachers' integration of technology into pedagogy is based upon three components: understanding of the need for change in teaching methods; understanding of the need to refer to students differently; and understanding the need to perceive teaching in a more systemic manner based on technological developments and the fact that society is a digital society. Additionally, constructs such as attitudes, perspectives, and competencies are important contributors to how teachers integrate technology into their pedagogy (Farjon et al., 2019). In fact, several research studies corroborate that the way technology is integrated into pedagogy

is strongly influenced by teachers' perspectives (Farjon et al., 2019; Karchmer-Klein, Mouza, Harlow Shinas, & Park, 2017; Vongkulluksn, Xie, & Bowman, 2018).

Teachers' perspectives on technology integration. In empirical research by Harper and Milman (2016) regarding the influences of technology in K-12 educational settings, teachers' perspectives about the role of technology affected the extent to which they integrated it in their pedagogy. Teachers who viewed technology integration as an opportunity to create authentic student-directed learning environments, tended to integrate it into pedagogy. On the other hand, teachers who did not share this view reported lower integration of technology.

Other research by Vongkulluksn, Xie, and Bowman (2018) corroborated Harper and Milman's (2016) findings that teachers' perspectives about technology influenced how they integrate technology into their pedagogy. Vongkulluksn et al. (2018) studied the perspectives of 624 sixth- through twelfth-grade teachers from 16 schools across a Midwestern state in the United States. Results from the study showed that teachers' perspectives had a direct association with teachers' technology integration into pedagogy. Teachers who believed that technology would enhance their teaching spent more time integrating technology into their pedagogical practices to foster student-centered instruction and higher order tasks. The results of the study by Vongkulluksn et al. (2018) suggest that policy makers and administrators need to be mindful that ensuring that teachers' have positive perspectives about the role of technology in pedagogy is an important part of overcoming the problem of teachers not integrating technology into content in ways that transform pedagogy and students' learning experiences.

Several research studies on the integration of technology in pedagogy indicated that there might be misalignment between teachers' perspectives and their actual practice. Karchmer-Klein et al. (2017) studied patterns in the ways middle school teachers who valued technology integration designed instructional methods. The selected participants valued the integration of technology in their pedagogy and were invested in the school-based technology initiative. The participants described themselves as "quick learners" and "comfortable with technology." While all participants were willing to integrate the technology into pedagogy, the study illuminated broad differences between teachers' perspectives of integration and their actual integration of technology into their pedagogy—specifically, some participants who viewed technology integration as supplemental to instructional methods fully integrated the devices as a central part of their pedagogical practices.

Conversely, the pedagogical practices of teachers who viewed the integration of the technology as central to their pedagogy reflected only partial integration. The misalignment between teachers' perspectives and actual practice may be related to the semantics of how 'technology integration' is defined by individual teachers and within different content areas. For some teachers, technology integration may be defined by how the teacher uses technology, but for others, it may be defined by how the students use the technology. There may also be incommensurable differences among technology integration as defined by classroom teachers compared to the definitions provided by the broader educational technology community.

Technology integration into subject-specific pedagogy. Some studies have used the TPACK framework for understanding technology integration when designing content-specific pedagogy. Szeto and Cheng (2017) completed a case study of how TK influenced the repertoire of pedagogical strategies in different subject-specific content areas. The results of the study could not be transferred because the pedagogy differed based on the content area.

For the mathematics teachers in the study by Szeto and Cheng (2017), technology integration was affected by the traditional nature of the subject area. For example, instructional methods typically used in mathematics classes included demonstrations, verification, drill and practice, and mastery of skills with paper and pencil. Teachers who believed students needed paper and pencil to solve mathematics problems were less likely to integrate technology or change their instructional methods teaching from traditional, teacher-centered methods compared to the teachers of English, music, physical education, foreign languages, visual arts, and general studies courses such as science, technology, social studies, and humanities (Szeto & Cheng, 2017).

According to the study by Szeto and Cheng (2017), the subject areas most likely to integrate technology into content in ways that transform pedagogy were music and general studies courses such as science, technology, social studies, and humanities. The findings reflect various pedagogical patterns of technology integration, based on the content area being taught. For example, teachers of English were more likely to integrate technology into the content as a means of extending students' understanding of language while science teachers integrated technology to illustrate science experiments. The

findings also revealed that teachers of English, mathematics, and general studies courses were more likely to integrate technology into their pedagogy when content-specific software or digital resources were supplied with instructional textbooks. On the contrary, physical education teachers were identified as "low users" due to their perspectives that physical education lessons required students' direct physical participation and technology could not be practically integrated.

Implications

In this study, I explored teachers' perspectives about integrating technology into their content-specific instruction in a way that transforms pedagogy and students' learning experiences. The findings provided data regarding teachers' experiences, perspectives, and challenges in integrating technology in their pedagogy and student learning. The anticipated findings from this study may suggest several implications for practice and policy at the local level. A possible project direction based on anticipated findings of the data collection and analysis include professional development and training materials for teachers. Another possible project direction is a position paper to district-level decision makers in the local school district that provide insights regarding teachers' experiences and perspectives about technology integration.

Local policymakers and school leaders may be able to use the data to support professional development that will be responsive to the experiences, perspectives, and challenges identified in the study. The data and results of this study may lead to recommendations related to how training and support opportunities may be improved for future iterations of technology integration initiatives. Although I focused on high school

core content teachers only, the results may also benefit the other teachers in the district, as the district requires all teachers to integrate technology in ways that support 21st-Century student-centered learning opportunities. The research shared in this study may provide insight into how to integrate technology with instruction to promote the 21st-Century skills of collaboration, creativity, critical thinking, and communication.

Moreover, in the local setting, technology integration was implemented as a top-down attempt at educational reform. Based on anticipated finding, future research to explore the perspectives of teachers who self-initiate technology integration could be developed to extend the understanding of the role of teacher voice and self-efficacy in technology integration. Furthermore, this study only investigated teachers' perspectives about integrating technology into their content-specific pedagogy, which may or may not be related to teachers' pedagogic knowledge and skills. Thus, in the future, a study of how teachers' pedagogic knowledge and skills impact how technology is integrated to transform learning might be explored. Additionally, examining the differences in the perspectives of teachers of non-core content areas and teachers of core-content areas may be of interest in the near future.

Summary

The literature review examined the integration of technology into instruction in ways that transform pedagogy and students' learning experiences. Previous research noted that technology integrated into pedagogy could transform instructional methods and increase students' acquisition of 21st-Century skills necessary for college, employment, careers, service, and life. The conceptual framework of TPACK provided a

lens through which researchers view teachers' technology integration in relation to the content and pedagogy. The literature review also provided a comparison between TPACK and SAMR, students' learning experiences, and how teachers' perspectives and the specific content area may influence their approach to integrating technology at varying levels.

Section two includes a discussion of the qualitative research methodology that will be used to explore the research questions. A case study research design allowed for a careful and reflective collection of multiple sources of data to gain an understanding of how teachers integrate technology into their existing subject-specific instruction. Section two will further justify the selection of the qualitative research design, selection of participants, and data collection. The section will conclude with a description of the data analysis.

Section 2: The Methodology

Introduction

The purpose of this study was to explore teachers' experiences, perspectives, and challenges integrating technology into content in ways that transform pedagogy and students' learning experiences. The perspectives of these teachers may expand the understanding of how the gap between theory and practice related to integrating technology into pedagogy can be closed among teachers in the local setting in a manner that can ensure that students will become proficient in 21st-Century skills. In this section, I explain the research method used in the study by first discussing the research design and rationale for its selection. Secondly, the selection of participants is justified. This section concludes with an explanation of the data collection and data analysis.

Research Design and Approach

Qualitative research methods are used to understand how people interpret their experiences, construct their worlds, and assign meaning to their experiences (Merriam, 2009). Lodico, Spaulding, and Voegtle (2010) supported the idea that qualitative research brings "the researcher in close contact with the participants to capture their perspectives on the meaning of reality" (p. 34). For this study, a case study approach was used to answer the research questions guiding the study:

RQ1: What are the experiences of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy?

RQ2: What are the perspectives of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district about integrating technology to transform their pedagogy and the learning experiences of their students?

RQ3: What challenges do high school teachers in core content areas (mathematics, science, social studies, and English) in the local district encounter when integrating technology to transform their pedagogy and the learning experiences of their students?

The nature of this study was a single site case study. According to Bogdan and Biklen (2007), qualitative case studies allow researchers to examine one setting, single subject, or a particular event. In this case, I studied technology integration in a local high school. A specific case may be a current, ongoing issue that is bounded by place and time. In this case study, I sought to study teachers' perspectives about integrating technology into content-specific instruction in ways that transform pedagogy and students' learning experiences in a bounded system. The bounded system was the group of teachers in core content areas (mathematics, science, social studies, and English) in one high school in the local district (place) who are being asked to integrate technology into their content-specific instruction in ways that transform pedagogy and learning experiences for students at this time. The case study approach derived logically from the guiding problem of this study, which was to understand why teachers in the local setting were not integrating technology in ways that transform pedagogy and students' learning experiences. Yin (2009) suggested that for "how" and "why" questions, the case study

has a distinct advantage. Qualitative research designs that were considered but not selected included ethnography, narrative analysis, grounded theory, and phenomenology.

Ethnography is the systematic study of people and cultures. According to Merriam (2009), the purpose of ethnography is to focus on human society and culture to produce a cultural interpretation of the phenomenon. Ethnographic case studies focus on a single group, activity, or process with a goal of identifying the shared patterns of behavior that develop over time (Lodico et al., 2010). Ethnography was not selected for this study because the goal was not to identify or describe the culture that exists in this setting. Instead, the goal of this study was to explore why the phenomenon is occurring in the setting. Data from the local district have revealed the phenomena occurring - teachers not integrating technology in ways that transform pedagogy and students' learning experiences. Therefore, the goal of this study was to explore teachers' experiences and perspectives about integrating technology into their pedagogy and challenges to technology integration. Furthermore, the scope of ethnography tends to be larger and have greater breadth than the bounded system being examined in this study.

The purpose of narrative analysis is to understand human experiences through stories, also called narratives (Merriam, 2009). Narrative research focuses on telling the story of individuals and their experiences in a particular context (Lodico et al., 2010). Narrative analysis was not selected because I sought to go beyond the narratives of the teachers in the local setting to explore why.

A phenomenological study investigates the lived experiences and perceptions of participants to a particular phenomenon (Fraenkel & Wallen, 2009). The two primary

goals of phenomenological research are to create a detailed description of the participants' experiences and to encourage participants to examine the meaning of their experiences (Lodico et al., 2010). This was not the goal of this study; therefore, phenomenology was not selected. Additionally, a case study design was selected over a phenomenological design due to the bounded nature of the system being studied. Case studies are more appropriate for studying bounded systems than phenomenology. According to Lodico et al. (2010), case studies can be differentiated from other forms of qualitative research by the fact that these studies focus on a bounded system.

The goal of grounded theory is to develop a theory that is grounded in the data (Merriam, 2009). Grounded theory can be differentiated from other types of research by its focus on building theory. On the other hand, the goal of a case study is to create an in-depth description and analysis of a bounded system (Merriam, 2009). This study involved both an in-depth description of how teachers in the local district integrate technology, their perspectives about technology integration, and challenges they face when integrating technology; therefore, a case study approach was selected.

Participants

Researchers have generally agreed that purposeful sampling in case study research should be guided by the aim of the particular study. According to Merriam (2009), purposeful sampling is based on the assumption that the researcher wants to gain insights and, therefore, must select a sample from which the most can be learned. Nonrandom purposeful sampling was used to initially acquire 12 high school teachers from one of the district's four high schools and representative of the standard core-content

courses (social studies, science, English, and mathematics). This subsection covers the selection criteria that were used to acquire participants, the rationale for the number of participants selected, and an explanation of how access to participants was gained.

Selection Criteria

Purposeful sampling was used to acquire participants who were knowledgeable about the phenomenon to be investigated. According to Lodico et al. (2010), purposeful sampling allows qualitative researchers to select a sample that has key knowledge or information related to the purpose of the study. Furthermore, Merriam (2009) explained the need for an "adequate number" (p. 80) of participants to answer the questions posed by the purpose statement of the research. The purpose of this study was to explore high school teachers' perspectives about integrating technology into content in ways that transform pedagogy and students' learning experiences. Therefore, the purposeful sample included a group of 12 high school teachers from one of the district's four high schools--teachers who are representative of the standard core-content courses (social studies, science, English, and mathematics). Also, to ensure that participants were knowledgeable about the phenomenon being studied, they needed to be teaching in a one-to-one classroom.

Justification for Number of Participants

The sample size in case studies depends on the questions being asked, the data being gathered, the analysis in progress, and the resources available to the researcher to support the study (Lodico et al., 2010; Merriam, 2009). According to Lodico et al. (2010), qualitative researchers typically select only one or a small number of individuals

to study. According to Guest, Bunce, and Johnson (2006), the number of participants selected for a qualitative study depends on the goal of the study. If the goal is to describe shared perspectives among a relatively homogeneous group – which is typically the case when purposeful sampling is employed, then a sample of 12 will likely be sufficient (Guest et al., 2006). For this case study, the tentative sample size was 12 high school teachers from one of the district's four high schools and who were representative of the standard core-content courses (social studies, science, English, and mathematics).

Establishing Researcher-Participant Working Relationships

In qualitative research, the role of the researcher is to gather wide-ranging and open-ended data through personal interactions with the research participants. For this study, my role responsibilities included using an in-depth qualitative interviewing approach to document the details of the research participants' perspectives and safeguarding participants and their data. According to Rubin and Rubin (2012), researchers using in-depth interviews are responsible for asking most of the questions and keeping a record of the conversations. Additionally, according to Yin (2009), the researcher is responsible for asking good questions and interpreting the answers fairly, being a good listener not trapped by existing ideologies or perceptions, and conducting research in an ethical manner and from a professional standpoint.

On the other hand, the responsibilities of the participants in this study were to make themselves available to complete one interview with the researcher. According to Rubin and Rubin (2012), participants are responsible for providing most of the answers to the researcher's questions. The responsibilities of both the researcher and participants

were communicated to participants in written form via a letter of invitation and an informed consent form.

Researchers completing a qualitative case study must seek to create close and respectful relationships with participants (Lodico et al., 2010). Taylor, Bogdan, and DeVault (2015) identified the importance of striking a balance between conducting the research and building a rapport with participants. The goal is to establish trust and credibility with participants. For this study, before beginning data collection, I arranged an opportunity to speak with each consenting participant individually, discuss the project, clarify any challenges that may be relevant to the setting, and identify any key concerns that the participants may have. According to Rubin and Rubin (2012), making initial contact is needed to communicate what the research is about and why the person being asked to participate should consider participation.

Additionally, the initial contact provided an opportunity for me to assure the participant that involvement was voluntary. During the initial contact, I reminded participants that at any point before, during, or following data collection, the participants could refuse to continue, and their data would be destroyed. According to Heath, Hindmarsh, and Luff (2010), providing opportunities to learn about participants' concerns and providing clarification about the goals and intentions of the research before the study begins helps to develop trust and a working relationship between the researcher and participants. Success in responsive interviewing requires developing a trusting relationship between the researcher and interviewee that encourages open, honest, and detailed replies. Establishing trust might influence a participant to volunteer or not

volunteer in a research study. According to Rubin and Rubin (2012), trust is required that the researcher will not make public what could be embarrassing or harmful to the interviewee.

Furthermore, Rubin and Rubin (2012) suggested that the researcher and participant work toward forming conversational partnerships to build open and trusting relationships. During this study, I played an active role during the interviews by encouraging conversation, reacting to what participants say, and asking detailed follow-up questions to initial answers. By using a responsive interview approach, I was able to adopt a style that was comfortable for both the interviewee and me.

Ensuring Ethical Protection

Contact information for prospective participants who met the selection criteria was obtained from the district's public staff directory after gaining permission from the Walden Institutional Review Board (Approval # 01-02-20-0415528). Lodico et al. (2010) noted the importance of obtaining informed consent, protecting participants from harm, and ensuring confidentiality. Before beginning the study, all prospective participants received a written copy of the informed consent form via email. The informed consent form provided information about the procedures to be followed and any possible physical, psychological, legal, or other risks. Participants were also informed that they may opt out of the study at any time with no repercussions. Before beginning the study, participants were asked to reply to the email with the words, "I Consent," within seven days. All participants agreed to participate in the study by responding to the first invitation. Therefore, there was no need to send out a follow up email.

Upon receiving informed consent from participants, email correspondence was used to arrange mutually agreed upon individual conversations to discuss the project goals and procedures, clarify any challenges that may be relevant to the setting, identify any key concerns that the participants may have, and share how confidentiality would be protected. During the initial conversation, I reminded participants that at any point before, during, or following data collection, the participants may refuse to continue, and their data would be destroyed. After the initial conversation, a mutually agreed upon time and location was determined for a 45-60-minute interview. During interviews, ethical considerations included allowing participants to respond freely. I was deliberate about not exerting pressure on the participants, not leading the participants, and not sharing my perspectives with them.

According to Fraenkel and Wallen (2009), the names of participants should be removed from all data collection forms whenever possible. For this study, participants' names were not disclosed, and no personal information that could be used to identify participants was used. When revealing findings, participants were referred to as Participant 1 through Participant 12 to maintain confidentiality.

Data Collection

The most common forms of data collection in case studies are responses to interview questions, documents, observations, artifacts, surveys, and focus groups (Lodico et al., 2010). For this study, in-depth qualitative interviews were used. According to Rubin and Rubin (2012), in-depth qualitative interviews are characterized by the researcher looking for rich and detailed information and using open-ended questions. To

ensure consistency, I collected the same type of data from each participant and followed the same data collection protocol when engaged with participants.

Interviews

In-depth interviewing was the tool of choice for this study and allowed me to not only pick participants who were knowledgeable but also to focus on a single topic to thoroughly explore (Rubin & Rubin, 2012). To get depth and detail from the interviews, the responsive interview structure suggested by Rubin and Rubin (2012) was used. The interview protocol consisted of three types of researcher-produced questions: main questions, probes, and follow-up questions (Appendix B). The questions were created by the researcher using constructs from the conceptual framework; specifically, the elements of TPACK were utilized to guide interview questions about teachers' perspectives about integrating technology (TK) into their content (CK) to transform their pedagogy (PK).

The one-on-one responsive interviews were scheduled during a time convenient to each participant and in a private location with no interruptions. There were 12 interviews conducted. I followed the suggestion by Rubin and Rubin (2012) that the researcher remains flexible, arranging interviews around the interviewee's availability and the need for privacy. Rubin and Rubin (2012) suggested a combination of using a digital audio recorder and taking at least occasional notes when conducting responsive interviews. For this study, with permission from the participants, the interviews were audio recorded in MP3 format using the Voice Recorder application on my password-protected iPhone. Interviews lasted approximately 30-40 minutes per interview.

According to Lodico et al. (2010), recorded interviews should be transferred into a written form. Similarly, Rubin and Rubin (2012) advised researchers to prepare transcripts that contain word-for-word written renditions of the questions and answers. Therefore, I transcribed each interview verbatim to produce a typed transcript. This was done as soon as possible after each interview was finished.

While preparing the transcription, I kept a separate memo file in my researcher's journal to make notes of any notable quotes that may suggest themes or provide answers to research questions. I also recorded a summary of the contents of each interview to refer to later, when I was ready to compare what was said across interviews (Rubin & Rubin, 2012). Hard copies of transcripts were kept in a locked file cabinet in my locked home office and on my password-protected computer located in my locked home office.

Researcher's Journal

After each interview, I reflected on the information heard and completed a preliminary data review. Reflective notes provided an opportunity for me to consider if questions needed to be refined for subsequent interviews. For this study, I recorded reflections, ideas, thoughts, and possible connections among data and participants. The researcher's journal was also an important part of avoiding researcher bias. According to Lodico et al. (2010), the researcher's journal could be used to record and examine the researcher's subjective impressions during a study to control researcher bias. Additionally, Rubin and Rubin (2012) suggested that rather than researchers pretending to have no biases, they should examine how their preconceptions might slant the research and then work to formulate questions to offset their biases. The use of a journal allowed

me to be aware of how my attitudes might influence questions asked and my reactions to answers.

The data is stored in password-protected files on my computer hard drive. This data will be kept for at least five years beyond completion of my study, as required by the university. The researcher's journal will also be kept for at least five years and will be stored in a locked file cabinet. After at least five years, sensitive paper documents will be shredded, and electronic data will be securely erased using a commercial software application designed to remove all data from the storage device.

Gaining Access to Participants

Permission from the Institutional Review Board (IRB) for Ethical Standards in Research of Walden University was sought. The district has an internal research approval system other than an IRB. As long as the study only involved surveying adults, permission from the district was not required and I was allowed to survey staff. Within 1 week of receiving IRB approval, I used the information in the staff directory to locate the names and email addresses of the teachers at the school who fit the criteria for the study so that I could email an invitation for them to participate. I sent an email to the first three qualified teachers listed in each content area, inviting them to participate in the study. The email detailed the purpose of the study, the time required to participate in the study, that participation was voluntary, as well as what they would be asked to do. Informed consent letters were attached to the email. The informed consent form ensured that the potential participants understood the nature of the research, were aware of any risks and were not forced either covertly or overtly to participate (Rubin & Rubin, 2012). Before

beginning the study, participants were asked to reply to the email with the words, "I Consent," within 7 days.

Researcher's Role

According to Rubin and Rubin (2012), the primary role of the researcher during responsive interviewing is to encourage conversation, ask detailed questions, and respond to what participants say. To do this, researchers must be aware of how their attitudes, biases, and feeling may influence the interview. As a former teacher who had to learn to integrate one-to-one technology in a classroom setting, I was aware of my biases. I embraced technology integration as a tool to enhance my pedagogy and felt that technology strengthened my students' abilities to collaborate, communicate, and think critically. As a researcher, however, I focused on the questions being asked and made a conscious effort to set my preconceived notions to the side. One way that this was achieved was by maintaining a researcher's journal. During the research study, I continued to engage in continuous, honest reflection and maintain nonjudgmental openness (Salmons, 2015) and used a journal to record my reflections, ideas, and thoughts about possible connections among data.

I have no supervisory responsibilities at the selected research site, nor do I have any supervisory responsibilities within the district. Since June 2017, my title has been Coordinator of Teacher Evaluation, and my non-evaluative role solely involves training principals on the State's processes for collecting teacher evaluation data. I do not have any subordinates, nor do I complete evaluations of any kind for any certified or support

staff. I do not have a professional relationship with the participants; therefore, my nonprofessional relationship with the participants did not affect data collection.

Data Analysis

Data analysis occurs when the researcher works out what the data says and means (Rubin & Rubin, 2012). The step-by-step process of data analysis established by Merriam (2009) was used to code each data set (interview transcript), construct categories from the codes, and find emergent themes within the coded categories. Themes are the outcomes of coding, categorization, or analytic reflection (Saldaña, 2013). For this study, thematic analysis allowed categories to emerge from the data. According to Saldaña (2013), thematic analysis is a data reduction and analysis strategy by which qualitative data are segmented, categorized, summarized, and reconstructed in a way that captures the important concepts within the data set. The goal of thematic analysis is to identify themes and use these themes to address the research.

Coding Procedures

According to Saldaña (2013), qualitative codes are essence-capturing elements that, when clustered together according to similarity and regularity, facilitate the development of categories. Recurring regularities and patterns in the data for this study became categories or themes into which subsequent items were sorted. In thematic coding, the analyst frequently begins with a list of anticipated themes, particularly when data are collected through semi-structured interviews. For this study, interview questions about teachers' perspectives about integrating technology knowledge (TK) into their content knowledge (CK) to transform their pedagogy were guided by elements of

TPACK. Hence, some themes, such as the constructs of TPACK (PCK, TCK, TPCK, and TPACK) were anticipated in the data set because these concepts were explicitly included in the research questions used for data collection.

First Cycle Coding

The approach of Boyatzis (1998) was used to work out consistent definitions to guide how codes were defined. According to Boyatzis (1998), a code definition can be created by labeling the word, term, or phrase; defining it; identifying how it will be recognized in other interviews; identifying what will be excluded; and recognizing an example of the code. Code definitions should stay as close to the meaning given by interviewees (Saldaña, 2013). Code definitions were created based on a few interviews and then tested to see how well they worked in a sample of interviews. If the definitions held up well in the sample, I kept them; if the definitions did not hold up well in the sample, I made changes to the code definition before coding the remaining interviews (Saldaña, 2013).

Coding was done by hand as I worked through hard copies of the transcripts with pens and highlighters. After reading and re-reading the transcripts to become familiar with the data corpus, I organized the data in a meaningful and systematic way by using first cycle coding to reduce the data into small chunks of meaning (Maguire & Delahunt, 2017; Saldaña, 2013). First cycle coding methods included descriptive coding and initial coding.

Descriptive coding. According to Saldaña (2013), descriptive coding allows the researcher to analyze the data's basic topics from which further categories may be

formed. For the descriptive coding, I used a combination of a priori and emergent key words to summarize meaningful chunks of data. The a priori key words harmonized with the study's conceptual framework and research questions. For example, elements of TPACK guided interview questions about teachers 'experiences, perspective, and challenges related to integrating technology knowledge (TK) into their content knowledge (CK) to transform pedagogical knowledge (PK) and students' learning experiences. Therefore, a priori key words such as *challenges, pedagogy, perspectives, students' learning experiences, teacher experiences, transform, PCK, TCK, TPK, and TPACK.* Furthermore, initial coding was used to allow additional codes to emerge from the data (Saldaña, 2013). During this cycle of coding, all proposed codes were tentative and provisional.

Code mapping. Descriptive codes that emerged from the a priori and emergent key words were placed in the margin next to the portion of the interview that contained the concept, theme, or event (Rubin & Rubin, 2012). The descriptive codes were then listed randomly on a word processor page as the first iteration of code mapping (Saldaña, 2013). Next, I examined the codes to determine if any captured a recurring pattern that cut across the data. The data were reduced into smaller chunks of meaning that resulted in initial codes.

The second iteration of code mapping included categorizing the initial codes by comparing and sorting them to determine which ones seem to go together (Saldaña, 2013). Patterns and regularities identified across the codes became categories into which subsequent items were sorted (Merriam, 2009). Next, the categories were examined for

patterns that captured something significant or interesting about the data and research questions. I used a third iteration of code mapping to collate the categorized categories even further into initial themes (Maguire & Delahunt, 2017).

Second Cycle Coding

To further develop a major theme from the data, I used second cycle coding methods to reorganize and reanalyze the data coded through the first cycle methods (Saldaña, 2013). Pattern coding was used as the second cycle coding method. Pattern codes are a way of grouping summaries into a smaller number of themes or constructs (Saldaña, 2013).

For second cycle coding, I reviewed the first cycle codes to assess for commonality and assigned them various pattern codes. The pattern codes were used to develop a statement that described a major theme or a theoretical construct from the data (Saldaña, 2013). If several pattern codes emerged from second cycle analysis, each one was examined to determine if it held merit as a major theme to analyze and develop. Major themes were based on the initial research questions that were asked, concepts frequently mentioned by the participants, and concepts and themes suggested by the published literature (Rubin & Rubin, 2012).

Trustworthiness

Trustworthiness is the degree of confidence in data, interpretation, and methods used to ensure the quality of a study (Pilot & Beck, 2014). According to Pilot and Beck (2014), credibility is one of the most important criteria that should be established by researchers to constitute the trustworthiness of a study. Credibility is the confidence in

the truth of the study and, therefore, the validity of the findings (Connelly, 2016; Pilot & Beck, 2014). Credibility is achieved in part, by showing that the researcher has talked to people who are informed about the research concerns (Rubin & Rubin, 2012). The purpose of this study was to explore teachers' experiences and perspectives about integrating technology into content in ways that transform pedagogy and students' learning experiences. To ensure that participants were informed about the research concerns of this study, one group of high school teachers were invited to participate—teachers who taught in core content areas (mathematics, science, social studies, and English) and who must integrate technology to transform their pedagogy and create 21st-Century learning experiences for their students. Once interviewees who were knowledgeable were chosen and informed about the research, they were asked to speak from their experiences.

Member checking was used to ensure the credibility of this study. Toward the end of the code mapping of the data, as I started to conceptualize themes, I used member checks as a tool to further validate the data. According to Birt, Scott, Cavers, Campbell, and Walter (2016), member checking is used to assess the trustworthiness of the results. The member checking technique proposed by Birt et al. (2016) was used to return a two-page summary of the findings for participants to check for accuracy of their data. This included synthesized data from the whole sample. To help me complete the analysis and develop interpretations, participants were asked to read the documents and comment on whether or not they felt that the synthesized data resonated with their experiences and if they thought anything should be changed. This enabled participants to add comments,

which were searched for confirming or disconfirming connections with the analyzed study data (Birt et al., 2016).

According to Rubin and Rubin (2012), further evidence of quality for responsive interviewing includes research results that are fresh and real; conclusions that are balanced, thorough, credible, and accurate; and final reports that are rich with ideas and details. For freshness and reality, people should be asked about life, and how they live it (Rubin & Rubin, 2012). For this study, I relied on the firsthand knowledge of participants who were knowledgeable about the phenomenon being explored. To produce results that were thorough with no major gaps in information, attempts were made to invite individuals with different vantage points concerning the topic of the study. For example, to ensure thoroughness in this study, high school teachers who were invited to participate, were representative of the standard core-content courses (social studies, science, English, and mathematics) and taught in a one-to-one classroom setting in the local district.

Additionally, discrepant data, or data that differs from the main body of evidence, were further reviewed for understanding and addressed and analyzed for meaning (Yin, 2016). Discrepant cases included any data with an alternative viewpoint. For example, if perspectives disagreed where they overlap, then I decided how to combine the perspectives by examining the descriptions of the event. I also reported areas of disagreement and, if possible, indicated why these perspectives do not agree with each other (Rubin & Rubin, 2012).

Data Analysis Results

Data for this study were generated through one-on-one responsive interviews. The interviews were audio-recorded and immediately transcribed, verbatim, to produce transcripts. After I transcribed each interview and checked for accuracy, I created code definitions for a priori codes that were derived directly from the study's conceptual framework and research questions. The code definitions were based on a few interviews and then tested to see how well they worked in a sample of interviews. Initial a priori codes included challenges, pedagogy, perspectives, students' learning experiences, teachers' experiences, transform, pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and TPACK. The initial list of a priori codes with explanations and exemplars from participants are listed below:

Challenges: Statements that gave examples of obstacles to overcome. "Students get on their phones and play games and Snapchat and text all day long…I think that's one of the biggest challenges, and showing them how to use this device for school purposes" (Participant 6).

Pedagogy: Methods of teaching. "I used direct instruction, modeling, guided practice, and independent work. Usually they're in groups of four" (Participant 9).

Teachers' perspectives: Statements that gave examples of a teacher's attitude toward or way of regarding something, point of view, or opinion. "I think it would be a huge disadvantage if I didn't have it (one-to-one technology). That would take a lot of power away from the kids" (Participant 3).

Students' learning experiences: Statements that gave examples of students' interactions in a course in which learning takes place. "Students observed a demo, wrote observations, observed the demo with a spectroscope and then do a reading assignment. As they're doing the reading assignment on the one-to-one technology, I can see their responses and provide feedback" (Participant 5).

Teachers' experiences: Statements that gave examples of something that the teacher has done or something that has happened to the teacher. "There have been a lot of aspects of technology that I've tried to engage with, that I did for a while and decided hey that's not really worth it anymore and move on" (Participant 1).

TK: Statements that give examples of teachers' knowledge about standard technologies and the skills to operate technology (Mishra & Koehler, 2006). "I have an iPad that I project on the screen so that I can demonstrate what I expect them to do" (Participant 3).

TPK: Statements that give examples of teachers' knowledge of the existence, components, and capabilities of various technologies and how teaching might change as the result of using technologies (Mishra & Koehler, 2006). "I use YouTube videos to point students to someone else explaining it, maybe something will click for them that didn't click for them when I was explaining it" (Participant 4).

TK-A: Statements that give examples of integrating technology (TK) into pedagogy within a content area in ways that augment (A) but does not transform traditional teacher-centered practices. "Notability (digital app) is almost like a piece of

paper but the digital version of a piece of paper and a graph paper all combined" (Participant 3).

The first cycle codes that emerged were examined through a first, second, and third iteration of code mapping to determine if there were any recurring patterns or categories. After I identified categories through the code mapping process, I further examined the categories for patterns that captured something significant about the data and research questions and collated these into initial themes. The initial themes identified from the data analysis were in alignment with the TPACK framework as described by Mishra and Koehler (2006) and the research questions.

Although the first cycle coding allowed me to reduce the data into initial themes, I still needed to develop major themes from the data. Therefore, I employed second cycle coding methods to reorganize and reanalyze the data coded through the first cycle coding methods. As recommended by Saldaña (2013), major themes included any pattern code that was common among three-fourths of the participants. In this study, three-fourths equated to nine or more participants. Figure 1 shows the relationship between a priori codes, emergent codes, and themes.

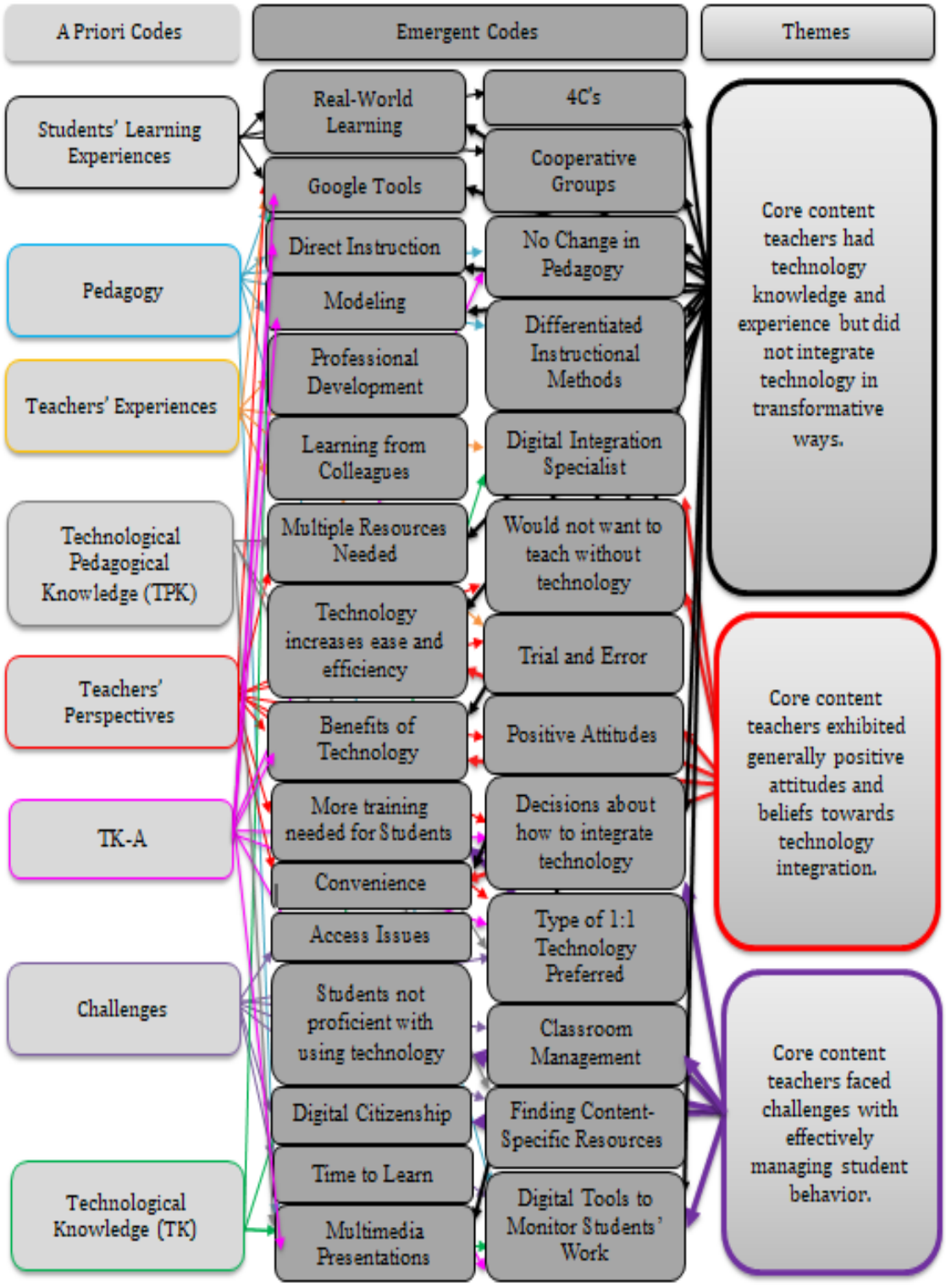

Figure 1. Relationship among a priori codes, emergent codes, and major themes.

The first research question addressed the experiences of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy. Within these discussions, participants reflected on the general methods they used for classroom instruction, how they integrated one-to-one in their teaching methods, and how they developed their knowledge about how to integrate technology into their pedagogy. The following codes emerged from the participants' responses: 4Cs, cooperative groups, no change in pedagogy, direct instruction, modeling, Google Tools, convenience, multimedia presentations, digital integration specialist, and digital tools to monitor students' work. The codes were reorganized and reanalyzed into the major theme of core content teachers had technology knowledge and experience but did not integrate technology in transformative ways.

The second research question focused on the perspectives of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district about integrating technology to transform their pedagogy and the learning experiences of their students. Participants reflected on what they liked or disliked about integrating technology into their teaching method, how they thought their instructional methods had changed as a result of technology integration, and how they thought students' learning experiences had changed as a result of technology integration. The participants identified perspectives that aligned with the following codes: digital integration specialist, would not want to teach without technology, technology increases ease and efficiency, benefits of technology, convenience, and positive attitudes. The

pattern codes were reorganized and reanalyzed into the major theme of core content teachers exhibited generally positive attitudes and beliefs towards technology integration.

The third research question pertained to the challenges high school teachers in core content areas (mathematics, science, social studies, and English) in the local district encounter when integrating technology to transform their pedagogy and the learning experiences of their students. Participants discussed specific challenges encountered by teachers and the challenges they observed among students. Participants identified the following codes: decisions about how to integrate technology, more training needed for students, classroom management, students not proficient with using technology, digital citizenship, and digital tools to monitor students' work. The major theme that emerged was core content teachers faced challenges with effectively managing student behaviors.

Findings

The specific local problem addressed in this bounded qualitative case study was teachers not integrating technology into content in ways that transform pedagogy and students' learning experiences. It is not understood in the local district why teachers, particularly teachers of students in Grades 9 through 12 who have access to one-to-one technology, continue to struggle with integrating technology in ways that transform their pedagogy and students' learning experiences. A need exists to understand the experiences and perspectives of teachers who are and are not integrating technology into their pedagogy in ways that transform learning for the students.

The purpose of this qualitative single-site case study was to explore teachers' experiences with and perspectives of integrating technology into content to transform

pedagogy and students' learning experiences. The purpose of the study and the research questions guided the project study's key findings. The organization of the findings was related to Mishra and Koehler's (2006) TPACK framework. The findings are organized and presented by the major themes that emerged from the data analysis. This section includes a discussion of the relationship of the findings to the research questions and the framework and related literature.

RQ1: What are the experiences of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy?

RQ2: What are the perspectives of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district about integrating technology to transform their pedagogy and the learning experiences of their students?

RQ3: What challenges do high school teachers in core content areas (mathematics, science, social studies, and English) in the local district encounter when integrating technology to transform their pedagogy and the learning experiences of their students?

Theme 1

Theme 1 was that core content teachers had technology knowledge and experience but did not integrate technology in transformative ways. The first research question asked about the experiences of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy. Based on participants' responses, I

defined teachers' experiences as statements that gave examples of something the teachers had done or something that had happened to the teachers. The findings of teachers' experiences aligned with the TPACK framework in that the participants shared experiences that helped them bridge the gap between their technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). The following pattern codes emerged from the participants' responses: 4Cs, cooperative groups, no change in pedagogy, direct instruction, modeling, Google Tools, convenience, multimedia presentations, and digital tools to monitor students' work.

All of the participants unanimously reported integrating Google Suite (G Suite) resources, which are free online applications tailored specifically for schools and compatible with one-to-one Chromebooks. Participants described their experiences using G Suite to encourage collaboration, creativity, and critical thinking among students. Participant 6 stated,

> We have Chromebooks at the high school level. And so that's the main thing we utilize in my class. We use a lot of Google apps on a day-to-day basis. I use a lot of Google docs, or Google slides to model new vocabulary. I'll have a set of Google slides that I share with the kids that have the definition and a picture to relate it…Sometimes I'll have them create their own slides or create their own work based on that.

Participants shared that the personalized support provided by their school's digital integration specialist (DIS) was another key component in learning how to integrate TK with their PCK. Most participants stated that working with the DIS increased their

technological knowledge (TK) and skills, changed their technology integration practices, and helped their students learn how to use the technology for learning purposes. Participant 10 stated, “I enjoy having all of these resources and we have like a great DIS. When I’m like… ‘Hey, I have this small idea,’ she can turn it into something massive.” Participant 8 explained how the DIS helped her increase her TPACK when she stated, “I have a hard time figuring out which resource would be best, which website, which app, whatever it is, and normally I go ask the DIS, and we work through it to figure it out.”

There were no obvious discrepancies in the data for theme 1. Two participants did not specifically mention the role of the DIS. However, these two participants stated that the technology professional development was important for them learning how to integrate technology into their pedagogy.

The participants were asked to give examples of differences in their pedagogy between now and prior to the introduction of one-to-one technology. The findings from this portion of the interviews correspond to the TPACK and SAMR construct matches (Kihoza et al., 2016). According to Kihoza et al. (2016), the SAMR model is based on the theory that technology integration into classroom practices transforms or enhances traditional pedagogies through the use of new technologies, either through the substitution, augmentation, modification, or redefinition of educational tasks. The information provided by the participants in the study revealed that they were primarily using the technology for pedagogical practices at the substitution and augmentation level of SAMR. Participant 9 provided an example of integrating technology at the substitution level of SAMR when he stated,

> I really think the only thing that I'm doing differently with the advancements of technology really is just disseminating information and resources differently. Instead of me printing in Algebra 2, it's more all your handouts are on Google Classroom.

Other participants shared experiences of integrating technology into their pedagogy in ways that augmented but did not transform their traditional teacher-centered practices. Participant 9 stated,

> I'm old school. I don't think my instruction has changed significantly. In math, I don't think you can replace teaching; it's just not like reading the book. I don't think I've changed anything; I am just using different resources to get information to the kids. Technology is helping me in that respect, but as far as instruction, it's facilitating, but I don't think it's changed what I do because it's still modeling.

When asked about the differences in students' learning experiences, participants also described integrating technology in ways that corresponded with the substitution and augmentation levels of SAMR. Participant 9 provided an explanation of how students completed an activity in his class now compared to in previous years. The participant stated,

> For instance, the posters on the wall are old statistics projects. This is the first year that students did the same projects strictly from the Chromebooks. So, the displays, the bar graphs, the histograms, pie charts, are all digital now. They submitted them electronically instead of putting them on poster board. Instead of

> them getting a protractor or compass, they just put the information in Google Sheets, and it spits it out.

When asked how pedagogical practices have changed, or have not changed, as a result of technology integration, Participant 7 stated,

> My technology hasn't really changed my approach to how I teach. It hasn't drastically changed my pedagogy, because I am thinking of the negative effects. More often than not, instead of getting that textbook and reading the concept, they just look it up on the internet in bits and pieces that they need to complete the task.

Data from this study very closely aligned with the research reported by Karchmer-Klein et al., (2017). While all participants in the study were willing to integrate the technology into pedagogy, there were differences between teachers' *perspectives* of integration and their *actual* integration of technology into their pedagogy. Similarly, in this study, teachers' perspectives of integration were different from their actual integration levels. For example, Participant 10 stated,

> I think more outside of a box. Like I remember at the school with no technology, I was having to be creative with the little resources we have. But now I can be creative, more relevant, and more connected to the way people learn now.

However, when asked to share specific examples of how her pedagogical practices have changed, Participant 10 stated, "I start class similarly. Before, I would start every class with a bell ringer. Now it's just digital."

There were three discrepant cases where the teachers used the modification and redefinition levels of SAMR to incorporate the 4Cs into students' learning experiences. These three participants (1, 5, and 9) reported creating learning experiences to connect students with resources outside of the classroom. All three made references to "the walls of the classroom fall down" to describe learning experiences that allowed students to communicate with the outside world or create things for the world outside of the classroom. Participant 5 reported,

> In Chemistry class, we're making soap companies, where each company has their own website, and each person represents a department from marketing to research and development and CEO of the company. But they are all working on the one site and developing the soap product based on content knowledge. They put products and documentation of their progress within that site, requiring them to do certain simple formatting, like changing a Word document, or a Google doc to a PDF. I think they're learning soft skills, and tech skills that an employer would expect from them. They work in the chemistry lab to make the product and hold company meetings to market and sell the products. They can't just make a website. They actually have to consider if the website would attract a customer base. Is the website appealing to the people they are trying to market it to? So, they have to think a lot.

Participants were asked about their perspectives on students' current learning experiences with technology as compared with students' experiences before one-to-one technology was introduced. Participants revealed perspectives about increased student-

centered learning experiences now compared to teacher-centered instruction before one-to-one technology. Participant 1 stated,

> There was more sage-on-the-stage. We were closed off. Resources had to come from the teacher. There wasn't a lot of flexibility. Resources were not as in depth. Student engagement was harder to get at. Wasn't much choice or as much collaboration. More just teacher telling. An old-fashioned view of teachers just going to give me everything I need, and students just regurgitate.

Furthermore, Participant 2 stated, "before one-to-one, I think students relied on me as a purveyor of information." When describing students' learning experiences now, Participant 2 stated,

> Technology gives them a lot of power. They can move at their own pace. They have choice. How students present the information is supposed to be up to them, in a way that they understand it best because the purpose is for the student. There is a lot of collaborating with each other. They communicate their ideas with each other. Students construct their own understanding and present it to me.

Participants were asked to provide specific examples of how they engaged in pedagogical practices that emphasized the 21st-Century skills of creativity, communication, collaboration, and critical thinking among students. Eleven participants were able to provide specific examples of how they incorporated the 4Cs into students' learning experiences.

Theme 2

Theme 2 was that core content teachers exhibited generally positive attitudes and beliefs towards technology integration. The second research question asked about the perspectives of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy. Based on participants' responses, I defined perspectives as statements that gave examples of a teachers' attitude toward or way of regarding something, point of view, or opinion. The following pattern codes emerged from the participants' responses: digital integration specialist, would not want to teach without technology, technology increases ease and efficiency, benefits of technology, convenience, and positive attitudes.

Participants communicated generally positive attitudes towards technology because of the ease of its use. According to Admiraal et al. (2017), perceived ease of use refers to the degree to which teachers think the technology will be relatively free from effort. The participants unanimously stated that technology integration made their teaching experiences easier and more efficient. Participant 7 stated, "Pretty much everything that I'm doing now, except whatever formative assessments that I give them, now I can easily integrate."

The terms easy, easier, or ease were used by all twelve participants at some point during the interview when describing how technology integration had changed their teaching experiences. When asked about the differences in current pedagogy compared to prior to the one-to-one technology, Participant 2 stated, "it's a lot easier now than it had been before." Participant 9 stated,

> You don't have to remember where you cut this, cut that, taped it on this paper, and then take it to the copy and run one clean copy. You know, it's just convenient. It's making my job easier. Everything I have is scanned in a folder somewhere online. So, for me, it's cut down on a lot of stuff.

Additionally, the participants reflected on the ease of use for students. Participant 8 stated,

> There's a lot of different resources that have kind of evolved and students have access to. It's much easier for them to type out notes versus when they had to on the iPads. It was hard for them to draw or try to type with a little keyboard on it.

There was one participant who added a perspective that was not shared by other participants. The discrepant case, Participant 7, felt very strongly that integrating technology into pedagogy was a "hindrance to students." Participant 7 stated, "It's made students a whole lot lazier, and dependent upon something that does not increase their learning of basic concepts, especially for less academically gifted students."
This participant was noted as a discrepant case because the opinion shared differed significantly from the other participants.

Additionally, participants described the convenience of using G Suite resources to provide instant feedback to students and track students' progress, as well as manage curriculum, assignments, and grading, all in one place. Many participants stated that G Suite tools increased efficiency by making work more organized for both teachers and students. When asked what she liked or disliked about integrating technology into her pedagogy to transform students' learning experiences, Participant 10 responded,

> I like that it has let me make it more relevant because technology is what they know. It's helped me teach them like how to be organized. How to creatively display stuff. My teaching is more relevant now. More organized. More helpful for teachers to be able to open a file on Google classroom and have everything.

Most of the participants stated generally positive views about the role of technology professional development as a key component of their learning experiences. When asked how she developed her knowledge of how to integrate technology into her pedagogy, Participant 1 stated,

> Professional development. I could not have done it if we did not have a school and district that fully supported it. The last two years, we've had really great PD sessions that are facilitated by teachers that actually use the technology. And that's been the most helpful.

The data related to this theme aligned with the empirical research in the literature review by Harper and Milman (2016) that those teachers who viewed technology integration as an opportunity to create authentic student-directed learning environments tended to integrate it into pedagogy. Additionally, research by Vongkulluksn, Xie, and Bowman (2018) corroborated Harper and Milman's (2016) findings that teachers' perspectives had a direct association with teachers' technology integration into pedagogy. In this study, the participants reported an overall positive attitude regarding technology integration. Furthermore, participants shared similar descriptions of integrating technology in ways that corresponded with the substitution and augmentation levels of SAMR.

Theme 3

Theme 3 was that core content teachers faced challenges with effectively managing student behaviors. The third research question asked about the challenges of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy. Based on participants' responses, I defined challenges as statements that gave examples of obstacles to overcome. The data gathered from the participant interviews regarding their challenges with integrating technology to transform pedagogy and students' learning experiences align with Research Question 3. Participants described difficulties they experienced integrating technology to transform their subject-specific pedagogy and students' learning experiences. They also shared how they overcame these difficulties. The following pattern codes emerged from the participants' responses: decisions about how to integrate technology, more training needed for students, classroom management, students not proficient with using technology, digital citizenship, and digital tools to monitor students' work.

Although the participants in the study recognized the benefits afforded by the one-to-one technology, there were also many challenges that accompanied these benefits. The participants all shared similar difficulties related to digital citizenship when it came to integrating technology to transform students' learning experiences. Participant 1 stated, "Kids are going to forget their Chromebooks. Students have to be trained. Kids still need parameters. We have to clarify expectations and explain logistics." Participant 6 stated,

> Students always feel like they need to be connected. I think just teaching them, especially ninth graders who have a tendency to be a little less mature, teaching them how to use the technology in a proper academic way. It's not just for fun.

Participant 2 stated,

> Students can become overwhelmed with the number of different tools and expectations. Sometimes it can interfere with learning. Sometimes students get frustrated with the number of different things they need to be learning, technology wise, in addition to the instructional requirements.

Some teachers, however, still noted that they were learning to overcome the challenges of effectively managing student behavior through the use of digital tools, such as Hapara©, which allows teachers to view students' browsing activity during class. For example, Participant 6 explained,

> They (district) brought in this software that you can use to monitor what they're (students) doing. I got my own mobile computer and so I can walk around the room and that kind of helped me to control all that.

Additionally, Participant 5 explained how she used the program, which is compatible to G Suite, to overcome the challenges associated with students' differing ability levels and classroom management. Participant 5 stated,

> Hapara© is a program that we have that's connected with Google classroom. I can see all the students' screens at the same time. So, when I observed that I noticed that student B might be five steps behind us, so that reminds me to go and check on them to see what he's doing.

For many of the participants, their pedagogy took into account the challenges they were trying to overcome. For example, Participant 5, who described using Hapara© to assist students of differing ability levels also chose pedagogical practices that were teacher-centered. When asked to describe her pedagogy, Participant 5 stated,

> Direct instruction, depending on the content. One-to-one or group work. Web searches or WebQuests. I can give them feedback electronically. Videos for modeling. Clips from Nova. Ladibug (document camera used to project images to a larger screen) to demonstrate what I'm doing with students so that they can make whatever constructions the same way as me.

Furthermore, Participant 5 expressed the following perspective, "There are still times where I just want to give up and tell them, but I've learned to be patient."

Many of the challenges mentioned by the teachers mirror the literature on classroom management with technology integration. According to Cho, Mansfield, and Claughton (2020), despite the importance of technology integration in the digital-age, some teachers may find it difficult to maintain orderly and productive classroom environments. Further, professional development for teachers in classroom management often occurs in the context of school-wide discipline trainings (Marquez et al., 2016). However, there is a pressing need for educators to understand classroom management as it relates to technology integration (Cho, Mansfield, & Claughton, 2020). The participants in this study expressed a need for additional training for students on how to use technology for academic purposes. Therefore, participants in this study would benefit

from additional professional development on classroom management specifically related to technology integration.

Evidence of Quality

According to Rubin and Rubin (2012), evidence of quality for responsive interviewing includes research results that are fresh and real. Furthermore, for freshness and reality, people should be asked about life and how they live (Rubin & Rubin, 2012). For this study, I interviewed participants who had firsthand knowledge of the phenomenon being explored. Participants included one group of high school teachers who taught in core content areas (mathematics, science, social studies, and English) and who must integrate technology to transform their pedagogy and create 21st-Century learning experiences for their students.

Participants were asked to speak from their experiences. After each interview, I reflected on the information heard and recorded reflective notes in my journal (see Appendix C). The researcher's journal helped me to avoid researcher bias and record important decisions and modifications I made during the methodology. According to Lodico et al. (2010), the researcher's journal allows a researcher to record and examine subjective impressions during the study. The reflective notes in my journal included my reactions to participants' responses, questions that I had after the interviews, reflections, thoughts, ideas, considerations and decisions, and possible connections among data and participants.

Toward the end of this qualitative case study, as I started to conceptualize themes, I used member checking as a tool to ensure the credibility of the study. Birt et al. (2016)

posited that member checking is a tool to validate the data further and verify or assess the trustworthiness of the qualitative results. I used the member checking techniques proposed by Birt et al. to send a two-page summary of the findings to participants via email for them to check for the accuracy of the data. The summary included synthesized data from the whole sample.

To complete the analysis and develop interpretations, I asked participants to read the documents and comment on whether or not they felt that the synthesized data resonated with their experiences and if they thought anything should be changed. Participants were asked to return the summary back to me within seven days with feedback about if the findings were an accurate representation of their data. Participants completed the member checks and informed me that the findings were accurate; therefore, I did not need to adjust my findings.

For further evidence of quality for responsive interviewing, Rubin and Rubin (2012) posited that conclusions should be balanced, thorough, credible, and accurate; and final reports should be rich with ideas and details. Therefore, I used rich descriptions to report the data. Additionally, discrepant data were further reviewed for understanding and addressed and analyzed for meaning (Yin, 2016). I reported areas of disagreement, and if possible, indicated why these perspectives did not agree with others.

Summary of the Findings/Outcomes

This qualitative case study explored teachers' experiences, perspectives, and challenges with integrating technology into content in ways that transform pedagogy and students' learning experiences. The perspectives of these teachers may expand the

understanding of how the gap between theory and practice related to integrating technology into pedagogy can be closed among teachers in the local setting in a manner that will ensure that students will become proficient in 21st-Century skills.

The conceptual framework that guided this study was Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge. The bounded qualitative case study design (Merriam, 2009) addressed three guiding research questions. Many of the participants stated that they were integrating technology into existing pedagogical practices in ways that increased student engagement but did not transform pedagogy. The goal in the local district, however, is for teachers to integrate technology with instructional methods in ways that transform their content-specific pedagogy and students' learning experiences. The finding from this study suggested several implications for practice and policy at the local level.

The participants expressed that receiving personalized support from the digital integration specialist (DIS), and integrating Google Suite was essential in helping them bridge the gap among their technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). Study results revealed that core content teachers were knowledgeable about how to teach the content and how technology can change how they teach (TCK); the capabilities of various technologies, such as Google Suite, that can be used for teaching (TPK); and teaching strategies that were appropriate for reaching a diverse group of learners (PCK). However, a need exists to support teachers' knowledge of how TPACK can be used to develop new epistemologies.

The results of the study indicated that teachers expressed positive attitudes towards the integration of technology in large part due to the ease and efficiency associated with its use. Furthermore, teachers reported efforts to integrate the 4Cs into pedagogical practices in efforts to create real-world learning experiences for students. However, many of the pedagogical practices of the participants remained unchanged. For example, many teachers reported still relying heavily on direct instruction and used technology to substitute and augment existing pedagogies. Therefore, there is a need to provide professional development for teachers on how they can use their TPACK to shift their pedagogical practices to higher levels of SAMR. At the higher SAMR levels of modification and redefinition, teachers can provide students with opportunities to apply ideas to produce innovative products, activities, and projects in ways that are new, useful, or add social or economic value (Kivunja, 2015; Rusdin & Ali, 2019).

The challenge that emerged from the data was digital citizenship. A need exists for students in the local district to receive on-going training about how to use technology for academic purposes and how to engage responsibly as a digital citizen. To date, the district has provided on-going professional development to teachers, but teachers have had to come up with ways to train and support their students. Furthermore, teachers reported that the district was already actively working to respond to this challenge by providing teachers with access to and professional development on digital applications that teachers can use to monitor students' activities in digital environments.

Based on the information gathered during the research, a position paper explaining the findings and presenting recommendations for change in the local district

was deemed more appropriate. The position paper outlined the local problem, explained the research findings, supported the research findings with peer-reviewed literature, and presented recommendations for change within the local district, based on the research outcomes.

District-level decision-makers and school leaders may be able to use the data to support professional development responsive to the experiences, perspectives, and challenges identified in the study. Furthermore, an understanding of their perspectives may lead to professional development, designed to meet their needs, and assist them with overcoming challenges they face when choosing how to use technology with their instruction (McCulloch et al., 2018). By exploring the perspectives of these teachers, decisions can be made on how these teachers can be supported as they change the learning experiences for students. Section 3 provides additional details for the proposed position paper and recommendations for change within the local district.

Section 3: The Project

Introduction

The project based on the outcome of this study was a position paper to district-level decision makers in the local school district. The position paper provided insights to leaders in the local setting regarding teachers' experiences and perspectives about integrating technology into their content areas in ways that transform pedagogy and students' learning experiences.

I designed this bounded case study using Mishra and Koehler's TPACK (see Mishra & Koehler, 2006) and Puentedura's SAMR (see Puentedura, 2006). One-on-one responsive interviews with 12 standard core-content teachers from one of the local district's high schools revealed teachers' overall positive attitudes and beliefs about technology integration. The teachers also felt that support from the digital integration specialist at the school as well as the ease and efficiency provided by technology provided benefits to both teachers and students. The 12 participants also expressed a need to create content-specific tangible resources during professional development that they can use in actual teaching and learning situations. The findings indicated that teachers benefit from being integrated into a community of learners who exchange ideas during and after professional development workshops. Furthermore, teachers expressed challenges with deciding how to integrate technology and how to address the learning needs of students with varying levels of technology proficiencies and digital citizenship.

I wrote a position paper explaining the findings and presenting recommendations for designing professional development to meet the needs of teachers and assist them

with overcoming challenges they face when choosing how to use technology with their instruction. The goal of the position paper is to generate support from education leaders in the local district for the professional development. In the position paper, I outline the local problem, explain the research findings, support the findings with the details from the literature review, and present recommendations for change within the local district. I developed my position by integrating background information from the literature review with the themes that emerged from the data I collected.

Rationale

The project was chosen because the literature review in Section 1 revealed that although access to technology has increased in United States' school systems (Matherson et al., 2014; McKnight et al., 2016), there continues to be little evidence that teachers have transformed their pedagogical practices to support the needs of 21st-Century learners (Frazier et al., 2019). Two project genres were considered for this study: a position paper and professional development. The position paper was chosen because it would provide immediate, current information to district leaders by giving a detailed account of the findings and recommending professional development as a part of the course of action to remediate the local problem.

One-on-one responsive interviews with 12 high school teachers who were representative of the standard core-content courses (social studies, science, English, and mathematics) revealed insights into teachers' perspectives regarding their integration of technology with their pedagogy. Teachers possessed perspectives about integrating TK into their CK in ways that affected their PK. For example, participant responses to RQ1

indicated that teachers had TK and relied heavily on Google Tools to support direct instruction, modeling, and cooperative learning in the classroom. Furthermore, participant responses to RQ1 revealed that there was little change in teachers' pedagogical practices and that technology was not integrated in ways that transformed students' learning experiences. Data from RQ2 revealed that teachers had overall positive perspectives about integrating technology into their pedagogy. Additional data from RQ3 revealed that teachers still faced challenges with teaching students' digital citizenship as well as challenges with managing student behavior.

In the position paper, I addressed the issues of teachers not integrating technology in transformative ways and challenges with effectively managing student behavior in one-on-one classrooms. I also cited extant research to support district leaders in understanding the significance of the results. Finally, I recommended strategies and actions for district leaders to consider implementing. The implementation of the recommended strategies may help the local district bridge the gap between research and practice. The rich, telling details provided by the teachers as well as local contextual factors serve as points of inspiration for designing professional development in the local district. Furthermore, targeted professional development may empower teachers to integrate technology in transformative ways that help students develop the 21st-Century skills needed to be successful as an employee, innovator, citizen, and lifelong learner.

Review of the Literature

The literature review supports my position paper's recommendations for professional development to support teachers' knowledge and use of TPACK to develop

transformative pedagogical practices and improve digital citizenship. The specific genre of this paper was chosen based on the participants' responses during the interviews. Based on the themes that emerged from the interview data, it was evident that many of the participants' pedagogical practices remained unchanged. It was also evident that teachers needed support with challenges related to managing student behaviors when integrating technology. Therefore, the position paper recommended professional development to address the teachers' pedagogical needs and resolve the challenges they expressed during the study.

I retrieved research articles from databases within Walden University's online library system and Google Scholar. The following databases were accessed within Walden University's online databases: Academic Search Complete, Dissertations & Theses @ Walden University, ERIC, Google Books, LearnTeachLib – The Learning and Technology Library, ProQuest Central, SAGE Journals, Science Direct, Taylor and Francis Online, and Thoreau Multi-Database Search. The terms searched were *classroom teachers, 21st-Century learning experiences, classroom technology integration, pedagogy, professional development, professional learning, students' learning experiences, technology in the classroom, TPACK,* and *transformation.* The peer-reviewed articles I used were published within the last 5 years, rendering them current. I chose articles that were relevant to the data analysis findings of the project study.

Transforming Pedagogy

The emerging literature on teacher education identified the TPACK framework as the foundation for teachers to unpack the skills and knowledge needed to design lessons

for the 21st-Century classrooms (Koh et al., 2015; Mishra & Koehler, 2006; Valtonen et al., 2017). However, proponents of the framework have posited that TPACK may not help teachers in their day-to-day practice (Dobozy & Campbell, 2016). Current research has indicated that the emergence of TPACK has not transformed teaching and learning (Heitink, Voogt, Fisser, Verplanken, & van Braak, 2017; Koh, Chai, & Lim, 2017; Pringle, Dawson, & Ritzhaupt, 2015). The research supports the findings in this study.

The participants in this study reported challenges with integrating technology to transform their PCK beyond traditional content delivery. Specifically, many of the participants reported relying heavily on direct instruction, modeling, and the use of cooperative groups with little to no change in pedagogy. The technology in the local district was being integrated at the substitution and augmentation levels of SAMR, resulting in little to no transformation of students' learning experiences. Therefore, specific research into how to equip local teachers for such transformations is still needed, especially since current technology integration efforts generally support traditional learning (Pringle et al., 2015; Tondeur, Aesaert, et al., 2017). Transforming students' learning experience requires that teachers be provided with professional development experiences that will reframe their current knowledge; challenge them to rethink, unlearn, and relearn; and change, revise, and adapt their current pedagogical practices.

The SAMR model encourages teachers to integrate TK into PCK according to a four-level approach. The structure of the SAMR model represents technology integration as belonging to one of four categories. According to Hamilton, Rosenberg, and Akcaoglu (2016), the SAMR model encourages teachers to move up from lower levels of

technology integration – substitution and augmentation – to the higher levels of modification and redefinition. It is at the higher levels of SAMR that teaching and learning is transformed.

Research supports the findings in the study that teachers had TK and integrated technology for instructional purposes; however, the process of student learning may not be transformed when the emphasis is on the technology-based product instead of the instructional objectives and learning outcomes (Hamilton et al., 2016). To support and transform students' learning experiences, teachers in the local district need professional development on how to use the SAMR model in their specific content areas.

Professional Development Opportunities

The participants in the study expressed generally positive views about the role of technology professional development as a critical component of their learning experiences. Zmuda, Curtis, and Ullman (2015) reported that one of the most significant contributors to the acceptance and success of technology integration is the preparation teachers receive through professional development opportunities. Similar to the teachers in the study by Zmuda et al. (2015), many of the teachers in in the local district attributed technology professional development, collaboration among peers, and expert training provided by the school's digital integration specialist as critical to their success.

Strategies for professional development include workshops, expert training, collaborative learning communities among peers, and shared decision-making (Fenton, 2017). Professional learning through regular, relevant, and ongoing professional development workshops support positive pedagogical changes (Albion, Tondeur,

Forkosh-Baruch, & Peeraer, 2015; Hall & Trespalacios, 2019; Zmuda et al., 2015). Additionally, the way professional learning is delivered can provide the framework, experience, and understanding to support teachers' self-efficacy toward implementing what they learn. However, the professional development needs of the teachers may change over time.

Changes in professional development needs over time. Fenton (2017) conducted a study to identify professional development activities that were critical for integrating one-to-one technology and what was needed to sustain the use of the technology beyond year one. In the study of 191 teachers who were in schools with one-to-one adoption programs, Fenton (2017) found differences between the professional development activities needed for first-year integration versus what was needed to sustain integration beyond the first year.

During the first year, teachers reported that they needed professional development on how to use the devices and how to manage the use of devices in the classroom. As teachers became more comfortable with the devices, they reported that professional development topics on instructional strategies were needed to sustain use beyond the first year. Furthermore, a significant theme that emerged from the study was teachers' perspectives about how professional development was delivered (Fenton, 2017). The teachers in Fenton's study reported challenges with having large-group professional development or a one-size-fits-all approach. Teachers have varied abilities and expertise (Fenton, 2017; Weinhandl & Lavicza, 2019). In the study, teachers reported success

when professional development was delivered in small groups and differentiated based on teachers' needs.

Weinhandl and Lavicza (2019) reported similar results in a study. Often, teachers in professional development form heterogeneous groups that differ in experiences, knowledge, attitudes toward the subject, technologies, or the learning process. The findings by Weinhandl and Lavicza indicated that for professional development to meet the diverse needs of teachers, it should not be based on lectures. Instead, teachers should be actively involved in hands-on activities that have relevance to their content areas. Hands-on professional development provides opportunities for teachers to transfer the training content into practice. Furthermore, teachers are more likely to integrate technology into their pedagogy when professional development aligns with the content they teach (Fenton, 2017).

The data from participant's interview responses in this study revealed a need for the local district to reexamine the nature of the current professional development approach as related to technology integration and the types of learning activities included in such professional development. The local district commonly chooses a workshop approach to conduct technology professional development. These workshops focus on the demonstration of technology knowledge (TK) in isolation from the teachers' content specific pedagogical knowledge (PCK). Such an approach leads to technology knowledge (TK) being learned outside classroom context, thus resulting in teachers finding it difficult to connect the technology knowledge (TK) learning to subject area content knowledge (CK) and classroom pedagogical knowledge (PK) (Jaipal-Jamani & Figg,

2015). Hence, for professional development to effectively promote TPACK – in a way that transforms pedagogy and students' learning experiences – it must be situated in content-centric ways that allow collaboration with peers and ongoing support from the digital integration specialist.

Collaborative learning communities. In a study of 191 teachers in secondary classrooms from districts with one-to-one technology integration programs, Fenton (2017) found that time to collaborate with colleagues and learning from peers on how they integrated technology, led to sustained technology integration. According to Fenton (2017), "collaboration with peers and work time was more important to teachers than one-on-one coaching or large group professional development" (p. 165). One conclusion from the study was that opportunities for teachers to learn from other teachers about how to integrate technology into content-specific pedagogy were critical for professional learning.

The need for collaboration was a significant finding in other technology integration studies (Longhurst, Jones, & Campbell, 2017; Weinhandl & Lavicza, 2019). In studying factors that impact teacher implementation of learning from professional development, Longhurst et al., (2017) found collaborative teacher-peer communities to be an emerging theme. The data suggested that trusted teacher-peer communities connected to how teachers modified and ultimately developed ownership of their pedagogical practices. The results of the study indicate a need to create collaborative learning communities that foster individual growth.

Similarly, Jaipal-Jamani and Figg (2015) reported teacher collaboration as a striking characteristic of technology professional development. In a study of TPACK-based professional development activities, teachers reported that they preferred collaborating with peers over formal professional development sessions. Teachers also preferred to have professional development sessions conducted during planning time and at a place convenient for collaborating with other teachers.

Benefits of professional development on TPACK pedagogical practices. Although the local district had already discussed TPACK as part of technology professional development, the interview data from the study revealed that although teachers could demonstrate technical skills and tool use, they still needed support with developing technology-enhanced pedagogy that would transform students' learning experiences. In other words, the participants in the study had technology knowledge (TK), but did not integrate technology into their content knowledge (CK) in ways that transformed their pedagogical knowledge (PK). Hence, professional development where teachers develop their TPACK to promote student learning of specific content is needed.

According to Jaipal-Jamani and Figg (2015), TPACK-based professional development activities are more effective than professional development where teachers learn technical skills in isolation from their content. Additionally, situating the learning of technology integration in an authentic learning activity that can immediately be used in pedagogy supports the transformation of students' learning experiences. For example, professional development for mathematics teachers in the local district on having students find and research real-life graphs and then creating their own multistep linear

equations to share on digital platforms for class discussions provides a concrete example of how mathematics teachers can integrate technology knowledge (TK) into pedagogical content knowledge (PCK) at higher levels of SAMR. This type of professional development is considered a content-centric approach, and the teacher knowledge developed through this approach is referred to as TPACK (Mishra & Koehler, 2006). Furthermore, according to Jaipal-Jamani and Figg, such an approach to professional development builds teachers' pedagogical knowledge (PK) about how to integrate technology knowledge (TK) with content knowledge (CK) to meet authentic curriculum learning goals.

In a case study to gain insights on how teachers experienced learning to design and teach with technology through a TPACK-based professional development approach, Jaipal-Jamani and Figg (2015) found that the learning of technology knowledge (TK) is effective when situated in authentic, content-centric learning activities. The findings of the study suggested the need to provide an immediate "application-in teaching" phase to help teachers transfer the technology knowledge (TK) they receive in professional development into real-time pedagogical practices. Moreover, Jaipal-Jamani and Figg (2015) posited that "a TPACK-based, content-centric model of technology professional development, as opposed to a focus on teaching technical skills in decontextualized contexts" (p. 188), was effective at developing aspects of teachers' TPACK. Additionally, the teachers in the study were better able to integrate TPACK in relation to the actual needs of the learners.

Challenges to Technology Integration

In addition to meeting learners' needs, technology integration also has the potential to help students gain digital literacy and 21st-Century skills such as the 4Cs – communication, collaboration, creativity, and critical thinking. Many of the participants in this study stated their intentions to integrate technology to create real-world learning experiences for students that incorporated opportunities for engagement in the 4Cs. Furthermore, all participants in the study were willing to integrate the technology into pedagogy. However, teachers' intentions to integrate technology in transformative ways differed from the ways they integrated technology into students' learning experiences.

Several research studies on the integration of technology in pedagogy indicated that there might be misalignment between teachers' intentions and their actual practice (Karchmer-Klein et al., 2017; Sadaf, Newby, & Ertmer, 2016). According to Sadaf et al. (2016), several enablers and challenges can affect how technology is integrated. For example, teachers' positive attitudes, access to technology, and support from other teachers often serve as enablers. On the other hand, lack of content-specific resources, classroom management and the behaviors of student learners often serve as challenges that impede transformative integration of technology.

Classroom management with one-to-one technology emerged as a challenge for core content teachers in the local district. Many of the teachers reported a need to train students on how to use technology for academic purposes. Additional challenges that emerged from the interview data included students not being proficient with using technology, classroom management, and digital citizenship. Similar challenges were

reported in a phenomenological research study by Heath (2017) in which a teacher reported that her students did not demonstrate a “native ease” when using tablets for educational use. She reported that her students were digital natives only when it came to social media, but not when it came to academic software programs. In the study by Heath the educator regrouped, changed her approach to instruction, and trained the students on how to use technology to manipulate subject-specific content and produce educational content.

According to Cho et al. (2020), many teachers have responded to similar challenges by embracing technologies for classroom management. For example, the ClassDojo© application was launched in 2011, but is now used in at least 90% of K-8 schools in the United States (ClassDojo, 2017; Williamson, 2017). The ClassDojo© application digitizes a token economy method such as those found in multi-tiered behavioral approaches to incentivize digital citizenship among students. In the local district, many of the participants in this study reported improved classroom management with the use of a digital platform called Hapara©. Using Hapara©, teachers in the local district were able to monitor students’ online activity during learning. There is a continued need for teachers in the local district to connect how technology can be used to support classroom management. Additionally, the introduction of tools intended to support students with self-discipline and self-regulation by helping them monitor and reflect on their own behaviors would support the local district’s goal of preparing students to be 12st-century learners.

According to Shyr and Chen (2018), many students find it difficult to be self-regulated to complete tasks in technology-based environments without external supports. Students often lack self-regulation abilities to control behaviors, emotions, and thoughts. Therefore, it is important for teachers to develop strategies that support self-regulation while students are working in technology-based environments.

Project Description

This project will be presented to district-level leaders in the form of a position paper. The position paper addressed the local problem, explained the research findings, supported the findings with the details from the literature review, and presented recommendations for change within the local district. This project aims to help district-level leaders understand the experiences, perspectives, and challenges of local teachers with integrating technology into content in ways that transform pedagogy and students' learning experiences. Finally, the project will ultimately help students in Grades 9 through 12 who have access to one-to-one technology by building capacity among teachers, who, in turn, can ensure students have the necessary 21st-Century skills needed for jobs, higher education, and training, careers, service, and life.

The position paper provided recommendations in each area identified in the study as a gap between theory and practice related to integrating technology into pedagogy in the local setting. A key component for district-level leaders is to consider implementing professional development for teachers to build on their existing TPACK to shift pedagogical practices to higher levels of SAMR. The position paper also recommended

that the district develop and provide professional development focused on the unique challenges teachers face with students' digital citizenship.

The TPACK-based professional development should include input from teachers and supports from digital integration specialists and the district's content-level coordinators. It should be content-centric and allow hands-on collaboration with peers. Furthermore, professional development should include instructional and classroom management strategies that teachers can immediately transfer into practice. There should be time for teachers to learn from and observe peers and develop their individual growth. Additionally, professional development should occur during teachers' planning time and convenient for teachers to learn collaboratively. Throughout the year, professional development should be assessed by core-content teachers, students in Grades 9 through 12, and district-level administrators to determine the achievement level of the targeted outcomes of integrating technology into content in ways that transform pedagogy and students' learning experiences.

Needed Resources and Existing Supports

The resources I need include access to district-level leaders, electronic copies of the position paper, and time. The local district already uses electronic resources and platforms to communicate with staff and to provide professional development. Furthermore, district-level leaders in the local district utilize video conferencing platforms such as Zoom and Google Meet for sharing information. Additional existing supports in place in the district are the district's coordinator of professional development and the one-to-one access to technology by district-level leaders. The coordinator of

professional development is responsible for arranging, approving, and maintaining a district calendar of professional development for all certified staff, including district-level leaders.

I will need time with district-level leaders to discuss the finding of the case study and share recommendations via the position paper. To gain access to district-level leaders, I will request a 30-45-minute presentation opportunity through the district's coordinator of professional development. Copies of the position paper will be distributed to district-level leaders in advance of the meeting via email. Although each district-level administrator has a personal device to access the position paper electronically, the position paper's hard copies will be made available upon request.

The local district has a district-level director of technology who works closely with school-level Digital Integration Specialists and district-level content-specific coordinators to provide ongoing support and feedback to both teachers and district-level leaders. The director of technology and digital integration specialists can provide district-level leaders with feedback on the progress of the professional development implementation. Additionally, the digital integration specialists at each local school can provide technology-specific support and coaching to teachers during the professional development while content coordinators provide content-specific support.

Roles and Responsibilities

It will be my responsibility to create a well-written, concise position paper that will help local district-level leaders understand and make decisions about technology professional development for local teachers. I will contact the district-level coordinator of

professional development to determine the best time to present the position paper to district-level decision-makers. It will be the district-level coordinator's responsibility to provide a date, time, and location to present the paper. It will be the district-level leaders' responsibility to read the position paper, attend the presentation, and determine whether they will implement the recommendations made in the position paper. It will be the responsibility of teachers to attend professional development and revise their pedagogical practices.

Potential Barriers and Solutions

The availability of district-level leaders, conflicts in dates for the presentation, or schedule may be potential barriers. By coordinating a meeting opportunity through the district's coordinator of professional development, I hope to overcome this barrier. However, I will accommodate each participant's schedule by meeting with them in a group or individual setting. If needed, I am also willing to meet a participant at a date, time, and location that is more convenient to them. Additionally, I will offer the flexibility of face-to-face meetings or via an online video conferencing platform such as Zoom or Google Meet.

Another barrier may be participants' resistance to meet. To overcome this barrier, after sending the position paper electronically, I will invite the participant to contact me with any questions or concerns. I will also extend an open invitation for a future opportunity to meet if they desire to do so.

Implementation and Timetable

The timetable for meeting with district-level leaders to present the position paper will be as soon as possible upon the start of school in the fall. The local district plans for professional development for teachers at least one year in advance of its delivery. Therefore, this would allow district-level leadership to spend the current school year developing professional development plans and an assessment of teachers' pedagogical practices and students' learning experiences for implementation during the following school year.

Project Evaluation Plan

A position paper was chosen for this project to present the local problem, explain the research findings, support the findings with the details from the literature review, and present recommendations for change within the local district. The evaluation plan will be both goals- and outcomes-based. The evaluation plan was chosen based on the themes that emerged from the data, the genre of the project, and the overall desired outcome for the local district and its teachers. The desired goals for this project are as follows:

- To present the research findings and recommendations for change within the local district,
- For district-level leaders to consider the recommendations and determine implementation strategies, and
- For district-level leaders to develop professional development that will help teachers integrate one-to-one technology in transformative ways.

The desired outcomes of this project are that

- Teaching and learning practices founded on epistemological assumptions and pedagogical research of the last century will be disrupted;
- Classroom pedagogical practices and teachers' pedagogical competencies will be transformed;
- Awareness among teachers regarding how TPACK can be used to transform lessons for 21st-Century classrooms will be increased;
- Opportunities for students in Grades 9 through 12 to engage in 21st-Century learning centered on the 4Cs will be increased; and
- Technology professional development anchored upon the pedagogical goals of 21st-Century learning and focused on teachers' TPACK will be developed; and
- Teachers' classroom management strategies and students' classroom behaviors will be improved.

The overall evaluation goals are to

- Track the implementation of the recommendations by district-level leaders;
- Track the development of TPACK professional development to help teachers integrate one-to-one technology in transformative ways;
- Track teacher implementation of strategies taught in professional development;
- Track transformations to teachers' pedagogical practices based on TPACK and SAMR as a result of professional development; and
- Track if teachers experience changes with managing student behavior as a result of strategies learned through professional development.

The evaluation plan will include follow-up with district-level leaders regarding what assessments were given, what professional development was offered, and what changes in pedagogical practices and students' learning experiences have been observed as a result of implementing the recommended strategies.

The key stakeholders affected by this project are district-level leaders who will be responsible for participating in the presentation and determining how to implement the suggested recommendations; high school teachers representative of the standard core-content courses (social studies, science, English, and mathematics) who will be responsible for participating in professional development and implementing the strategies presented; the district-level director of technology, school-level digital integration specialists, and district-level content-specific coordinators who be responsible for providing ongoing support and feedback to both teachers and district-level leaders; and students in Grades 9 through 12 who have access to one-to-one technology who will ultimately reap the benefits of empowering and engaging 21st-Century learning experiences.

Project Implications

The project has the potential to affect practices at the local level and in a larger context. At the local level, there is a potential for district-level leaders and local policymakers to improve professional development opportunities in ways that are responsive to the experiences, perspectives, and challenges identified by teachers in the local district. This project also has the potential to equip teachers better to integrate technology in ways that transform pedagogy and students’ learning experiences.

In a larger context, the local setting's professional development could be implemented in other districts across the nation. A massive shift in the K-12 education landscape, as a result of a global pandemic, has increased expectations for teachers to transform their pedagogy to integrate technology in one-to-one online learning environments. Furthermore, because of school closures, many districts have increased the students' access to one-to-one devices. However, a wide range of teachers' pedagogical approaches, when integrating technology, may potentially lead to a big divide in the quality of instruction students receive. Therefore, how this local district addressed the issue of technology integration in ways that transform pedagogy could be a prototype for other districts as teachers adapt their technology-driven instructional methods. Thus, the local district's professional development model may lead to positive social change by supporting districts and teachers who are rapidly working to put together professional development programs, while at the same time protecting students' learning experiences in one-to-one learning environments.

Conclusion

The results of this case study indicated a need for a position paper to district-level decision makers in the local school district. The position paper explained findings of the study and provided recommendations for professional development to meet the needs of local teachers. The recommended professional development will also assist local teachers with overcoming challenges they face when integrating technology into their pedagogy in transformative ways.

In Section 3, a brief description of the proposed project was presented, the rationale for proposing a position paper over other genres was presented, and literature relevant to the research findings were reviewed. Additionally, section 3 also included a description of the project, a project evaluation plan, and project implications. In section 4 I will discuss strengths and limitations of the project, recommendations for alternative approaches, personal analysis of my growth specific to the research and development of the project and share directions for future research.

Section 4: Reflections and Conclusions

Introduction

In this case study, I explored teachers' experiences and perspectives and challenges with integrating technology into content to transform pedagogy and students' learning experiences. I conducted one-on-one responsive interviews with 12 high school teachers from one of the district's four high schools and representative of the standard core-content courses (social studies, science, English, and mathematics). Then, I coded the data sets, constructed categories from codes, and found emergent themes. I used thematic analysis to identify themes that addressed the research questions. I decided that a position paper would help district-level leaders understand the experiences, perspectives, and challenges of local teachers integrating technology into content in ways that transform pedagogy and students' learning experiences. Furthermore, the position paper provided recommendations for professional development in each area identified in the study as a gap between theory and practice related to integrating technology into pedagogy in the local setting.

In section 4, I discuss the project's strengths and limitations, recommendations for alternative approaches, and share directions for future research. The section also includes a personal analysis of my growth specific to the project's research and development. Finally, I conclude with a strong message that captures the critical essence of the study.

Project Strengths and Limitations

Project Strengths

In writing the position paper, I used the data from one-on-one responsive interviews with 12 high school teachers from one of the district's four high schools and representative of the standard core-content courses (social studies, science, English, and mathematics). This is a strength of the project because the data provided immediate, current information to district leaders by giving a detailed account of the findings directly from the local teachers. Furthermore, the recommended strategies for professional development as a part of the course of action to remediate the local problem is informed by best instructional practices and strategies outlined in the literature (Albion et al., 2015; Fenton, 2017; Hall & Trespalacios, 2019; Koh et al., 2015; Mishra & Koehler, 2006; Valtonen et al., 2017; Zmuda et al., 2015). The first-hand experiences, perspectives, and challenges of local teachers integrating technology into content to transform pedagogy and students' learning experiences increased the strength of the recommendations provided in the position paper and the choice of the project genre.

Another strength of this project is that the recommended strategies in the position paper for professional development have the potential to benefit teachers and students in the local setting and the broader context. According to the second literature review, one of the most significant contributors to successful technology integration is the preparation teachers receive through professional development opportunities (Zmuda et al., 2015). Therefore, if my recommendations for professional development are implemented and

the project evaluation indicates that the desired goals and outcomes are met, this project can be implemented in other districts across the nation facing similar challenges.

Project Limitations

A limiting factor in this project was that the purposeful sample included a group of teachers representing standard core-content courses (social studies, science, English, and mathematics). It could be argued that the focus on teachers of core-content courses limits the generalizability of the findings of this study. However, this case study results can provide an important foundation for further investigation of how teachers' experiences, perspectives, and challenges with integrating technology affect pedagogy and students' learning experiences. Furthermore, this limitation can be overcome by providing professional development for all teachers.

Recommendations for Alternative Approaches

Several alternative approaches could be considered to address the problem. One alternative approach would be to design professional development training based on the findings from the data analysis. This alternative approach would have involved outlining components, timelines, activities, and materials for implementing a professional development plan that would help teachers integrate one-to-one technology in transformative ways.

For this study, I interviewed only a purposeful sample of high school teachers of core content subject areas in one high school. Another alternative approach that could have been used would have involved teachers of core and noncore content subject areas.

This alternative approach would have allowed for an increased sample size that could have allowed me to expand my research findings.

Finally, I could have interviewed the school-level digital integration specialists in the local district as an alternative approach. The school-level digital integration specialists work with both teachers and students to support existing technology integration efforts in the local district. This approach would have allowed me to gather data from the unique perspective of participants who observe and support technology integration at the teacher and student levels. Additionally, the outcome of this alternative approach could also be recommendations for professional development to support further teachers and students, in the areas identified by the data. It is not known, however, how the identified needs, as expressed by the digital integration specialists, compare to the needs and challenges directly expressed by the teachers.

Scholarship, Project Development, and Leadership and Change

The process of researching and developing this project has helped me evolve from student to scholar. As I reflect on my evolution during project development, I am aware of the skills I have developed as a writer, researcher, critical thinker, and communicator. I have grown and developed in the areas of (a) in-depth knowledge in the subject area of the dissertation, (b) research methodology, and (c) analytical skills to produce and disseminate research findings.

In developing knowledge of the subject area, I learned how to undertake literature reviews using electronic databases through the Walden University library and Google Scholar. In the construction of the proposal and final draft, accessing research was

essential. As I read the scholarship that others had published about the topic, I was able to gain new knowledge. The rigorous application of academic research strengthened the depth of my knowledge. Furthermore, the exhaustive review of previous research allowed me to develop a well-designed methodology section.

The development of the methodology helped me grow in the ability to analyze data objectively. Additionally, I learned to evaluate and justify methodological choices. The development of the methodology increased the understanding of ethical and philosophical considerations that must be made during the research process. Thus, I was able to use this understanding to produce research findings in an objective and scholarly way.

The process of project development increased my skills in communicating, organizing, and preparing actionable solutions. Investigating a meaningful topic and participating in research to understand the root causes of the problem in the local district has influenced me to act as a leader. Dissemination of findings to local decision-makers, by way of a position paper, may catalyze systemic change in the local district. Furthermore, continued dissemination of the research findings to policymakers and stakeholders across the nation may encourage collective action toward change.

Reflection on the Importance of the Work

The journey of completing this dissertation has helped me to reflect on the role of education in social change. During the development of the study, I often reflected on how my research can serve as a locus of that change. My reflections led me to realize that this

study is important to advance students' educational preparation to meet the demands of an increasingly technological world.

A review of scholarly articles related to the topic and a review of data relevant to the local district's problem revealed that technology integration efforts in the local district and across the nation have tended to reinforce an unjust status quo in classrooms. Furthermore, I learned that technology integration has not led to transformational educational goals. Thus, this work is important for transforming pedagogical practices and students' learning experiences with technology.

Implications, Applications, and Directions for Future Research

The research for this project could benefit teachers, students, and district-level decision-makers in the local school district. Before social change can occur for students, it must first occur at the level of policymakers, decision-makers, and be inclusive of the voice of the teachers who serve as the agents of change. I believe that this project can have a substantial impact in promoting social justice for students by using feedback from teachers to recommend policy changes.

Implications

The results of the study provide insights into teachers' experiences, perspectives, and challenges with integrating technology into their content in ways that transform pedagogy and students' learning experiences. The findings from this study suggested several implications for practice and policy at the local and national level. The implications for positive social change emerged from the data collected during the teacher interviews.

The research findings revealed a gap from theory to practice in the local district. In theory, teachers should be integrating technology in ways that transform pedagogy, and the district's professional development should be supporting their abilities to do so. However, in practice, there is little to no change in pedagogy. Therefore, a position paper was developed for district-level decision-makers in the local school district based on the research data and analysis. A potential implication of this project study is that it may lead to ongoing professional development designed to increase teachers' knowledge with the result that teachers may be able to create technology-integrated classrooms that equip all students with 21st-Century skills, resulting in an education that can more efficiently and effectively promote social justice. Another implication of this study is that the information collected during the teacher interviews suggested how training and support opportunities may be improved for future iterations of technology integration initiatives.

Applications

Although I focused on high school core content teachers only, the project applies to other teachers in the district, as the district requires all teachers to integrate technology in ways that support 21st-Century student-centered learning opportunities. The research shared in this study may provide insight into how all teachers can integrate technology with instruction to promote the 21st-Century skills of collaboration, creativity, critical thinking, and communication. In a broader context, the local setting's professional development could be applicable in other districts. A massive shift in the K-12 education landscape has increased teachers' expectations to transform their pedagogy to integrate technology in one-to-one online learning environments. Therefore, since the local district

shares the same challenges with many districts across the nation, other districts -- locally and nationally, may be able to apply the recommendations made in this project.

Directions for Future Research

The findings from this study provide direction for recommendations for practice and future research. In the local setting, technology integration was implemented as a top-down attempt at educational reform. Based on research findings, a recommendation for future practice is that districts use data from teachers, students, parents, and the community to influence reform initiatives and professional development. Another recommendation for practice is that districts include teacher voice in educational decision-making and planning, particularly in classroom-related issues such as pedagogy, student learning, classroom management, and professional development.

Moreover, future research to explore the perspectives of teachers who self-initiate technology integration could be developed to extend the understanding of the role of teacher voice and self-efficacy in technology integration. Furthermore, this study only investigated teachers' perspectives about integrating technology into their content-specific pedagogy, which may, or may not, be related to teachers' pedagogic knowledge and skills. Thus, in the future, a study of how teachers' pedagogic knowledge and skills impact how technology is integrated to transform learning might be explored. Additionally, examining the differences in teachers' perspectives of non-core content areas and teachers of core-content areas may be of interest soon.

Conclusion

This project study was designed to address the problem of teachers not integrating technology into content in ways that transform pedagogy and students' learning experiences in a local school district. The local problem was present among high school teachers where the majority of the teachers reported on a district survey that they integrated technology in ways that enhanced but did not transform pedagogy. As a result, I designed this study to explore one group of high school teachers' perspectives and experiences in core content areas (mathematics, science, social studies, and English) who must integrate technology to transform their pedagogy and create 21st-Century learning experiences for their students.

Through the literature review process, I learned that there was a gap from theory to practice in the local district. In theory, professional development should be supporting the abilities of teachers to transform pedagogy. However, in practice, there was little to no change in pedagogy or students' learning experiences. As a result, I designed a case study.

The case study was grounded in Mishra and Koehler's (2006) technological pedagogical content knowledge framework. The data collection was guided by three qualitative research questions. Data were collected through in-depth qualitative teacher interviews with 12 high school teachers from one of the district's four high schools--teachers who are representative of the standard core-content courses (social studies, science, English, and mathematics). The findings revealed teachers' experiences, perspectives, and challenges with integrating technology into content in ways that

transform pedagogy and students' learning experiences. These teachers' perspectives expanded the understanding of how the gap between theory and practice related to integrating technology into pedagogy can be closed among teachers in the local setting in a manner that will ensure that students will become proficient in 21st-Century skills. Additionally, this study's finding suggested several implications for practice and policy at the local and broader levels.

The resulting project was a position paper to district-level leaders that addressed the local problem, explained the research findings, supported the findings with the details from the literature review, and presented recommendations for change within the local district. The positive social change anticipated by the implementation of the recommendations is an increased understanding of the support teachers may need to overcome the challenges they face related to integrating technology in transformative ways. The potential exists to benefit parents and the local community by equipping students to be immediately employable and employed by businesses in the community upon graduation. Thus, the net effect is that students will be much better prepared for advanced training in jobs that require knowledge of technology, higher education at colleges and universities, careers, life as lifelong learners and contributing as productive citizens in a democracy.

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Appendix A: The Project

Strategies to Support Teachers' Knowledge and use of TPACK to Transform Pedagogy and Students' Learning Experiences

Introduction

The intent of this position paper is to provide evidence-based recommendations to the leaders in the local setting regarding teachers' experiences and perspectives about integrating technology into their content areas in ways that transform pedagogy and students' learning experiences. The focus of this paper is the identified perspectives of a group of teachers in core content areas (mathematics, science, social studies, and English) in one high school in the local district who are being asked to integrate technology into their content-specific instruction in ways that transform pedagogy and learning experiences for students at this time. Despite massive investments by the local school districts in one-to-one technologies with the expectation that teachers integrate technologies to transform pedagogy and students learning experiences, most local teachers use technologies to do what they have always done.

This paper aims to help district-level leaders understand the experiences, perspectives, and challenges of local teachers with integrating technology into content in ways that transform pedagogy and students' learning experiences. Finally, the recommendations will ultimately help students in the local district in Grades 9 through 12 who have access to one-to-one technology by building capacity among teachers. In turn, teachers can ensure students have the necessary 21st-Century skills needed for jobs, higher education and training, careers, service, and life.

Background

During the last decade, there has been an emergence of educational technology initiatives in several states (Tallvid, 2016). School systems are rapidly incorporating technology, as evidenced by district and statewide adoptions of initiatives such as one-to-one programs (McKnight et al., 2016). The goal of educational technology initiatives is to transform teachers' pedagogical practices to create empowering and engaging 21st-Century learning experiences for students (Schwartz & Szabo, 2018). Twenty-first learning experiences are characterized by the incorporation of the 21st-Century skills of communication, collaboration, creativity, and critical thinking – often referred to as the "4Cs" (Netolicka & Simonova, 2017).

The U.S. Department of Education (2017) released a National Education Technology Plan focused on assuring that technology is used in classrooms to "enable personalized learning or experiences that are more engaging and relevant" (p. 12). However, according to Graziano, Foulger, Schmidt-Crawford, and Slykhuis (2017), technology integration into pedagogy in many classrooms is still being used for low-level instructional tasks such as drill-and-skill, writing using word processing, creating spreadsheets, and making presentations. Despite massive investments by school districts in technologies and acknowledgments that the technologies should transform classroom instruction, most classroom teachers use technologies to do what they have always done, with little to no change in pedagogy (Admiraal et al., 2017; Liu, Tsai, & Huang, 2015; Tallvid, 2016; Telese & Butler, 2015).

There is an ongoing challenge in educational reform about how teachers are to integrate technology with instruction in ways that transform their content-specific pedagogy and assist students in developing 21st-Century skills (DeCoito & Richardson, 2018; Liao, Ottenbreit-Leftweich, Karlin, Glazewski, & Brush, 2017; Matherson, Wilson, & Wright, 2014; Vasinda, Ryter, Hathcock, & Wang, 2017). These skills generally include emphasis on problem solving through collaboration; use of technology for the creation of prototypes, products, research, presentations, and communication; and real-world applications (Blau, Peled, & Nusan, 2016; Christensen, 2015; Liao et al., 2017; Peled, Blau, & Grinberg, 2015). But to teach these skills, the simple introduction of technology is not enough (Schwartz & Szabo, 2018). According to McCulloch, Hollebrands, Lee, Harrison, and Mutlu (2018), it not only matters that teachers integrate technology into their pedagogy, but it also matters *how* they integrate it.

The expectation for teachers to integrate technology with instructional methods in ways that transform their content-specific pedagogy and students' learning experiences has been the goal in the local district since the introduction of one-to-one Chromebooks for students in grades nine through 12 in August 2016. The one-to-one initiative was in response to the passing of a law in May 2016 by the state's legislature that required schools to provide innovative, technology-based pedagogy for the delivery of learning. This paradigm shift requires local teachers to integrate technology into their current content-specific instruction in ways that transform their pedagogy.

According to research, professional development is a necessary element for pedagogical change, especially related to the integration of technology to enhance the

learning experiences for students (Tondeur, Forkosh-Baruch, Prestridge, Albion, & Edirisinghe, 2016). Although ongoing professional development based on technology, pedagogy, and content knowledge (TPACK) has been provided to teachers in the local setting, the majority of teachers are still not integrating the technology in ways that transform their pedagogy. Hence a gap from theory to practice exists in the local district. In theory, teachers should be integrating technology in ways that transform pedagogy, and professional development should be supporting their abilities to do so (Hur, Shannon, & Wolf, 2016). However, in practice, teachers are layering technology into antiquated pedagogy with little to no change in learning experiences for students, as evidenced by the results of the local school district's survey and the Future Ready (2017).

In a recent district report of how teachers were integrating technology in their content-specific pedagogy, based on the four levels of Puentedura's model of substitution, augmentation, modification, and redefinition (the SAMR model), the majority of teachers reported that they were integrating technology at the substitution or augmentation levels. Few teachers reported that they were using the technology in ways that modified the pedagogy, and even less reported integrating technology in ways that redefined pedagogy. Furthermore, a very small percentage reported not integrating technology into their pedagogy at all. The results of the survey for this high school was representative of the results of the other three high schools surveyed. Overall, the majority of the high school teachers in the local district reported that they integrate technology in ways that enhance, but do not transform pedagogy.

The need to conduct a case study originated with a desire to understand in the local district why teachers, particularly teachers of students in Grades 9 through 12 who have access to one-to-one technology, continue to struggle with integrating technology in ways that transform their pedagogy and students' learning experiences. Before designing more professional development to assist teachers in closing the gap between theory and practice, a need existed to understand the perspectives of teachers who are and are not integrating technology into their pedagogy in ways that transform learning for the students. Without understanding exactly how their instructional methods are or are not transforming students' learning experiences, these teachers may not be able to set achievable goals to transform their pedagogy to improve content learning for students.

Summary of Analysis and Findings

The purpose of this qualitative single-site case study was to explore teachers' experiences with and perspectives of integrating technology into content to transform pedagogy and students' learning experiences. The findings are organized and presented by the major themes that emerged from the data analysis. This section includes a discussion of the relationship of the findings to the research questions (RQs).

RQ1: What are the experiences of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy?

RQ2: What are the perspectives of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district about integrating technology to transform their pedagogy and the learning experiences of their students?

RQ3: What challenges do high school teachers in core content areas (mathematics, science, social studies, and English) in the local district encounter when integrating technology to transform their pedagogy and the learning experiences of their students?

Theme 1

Core content teachers had technology knowledge and experience but did not integrate technology in transformative ways. The first research question asked about the experiences of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy. Based on participants' responses, I defined teachers' experiences as statements that gave examples of something the teachers had done or something that had happened to the teachers. The findings of teachers' experiences aligned with the TPACK framework in that the participants shared experiences that helped them bridge the gap between their technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). The following pattern codes emerged from the participants' responses: *4Cs, cooperative groups, no change in pedagogy, direct instruction, modeling, Google Tools, convenience, multimedia presentations,* and *digital tools to monitor students' work.*

All of the participants unanimously reported integrating Google Suite (G Suite) resources, which are free online applications tailored specifically for schools and compatible with one-to-one Chromebooks. Participants described their experiences using G Suite to encourage collaboration, creativity, and critical thinking among students.

Additionally, participants shared that the personalized support provided by their school's digital integration specialist (DIS) was another key component in learning how to integrate TK with their PCK. Most participants stated that working with the DIS increased their technological knowledge (TK) and skills, changed their technology integration practices, and helped their students learn how to use the technology for learning purposes.

The participants were asked to give examples of differences in their pedagogy between now and prior to the introduction of one-to-one technology. The findings from this portion of the interviews correspond to the TPACK and SAMR construct matches (Kihoza, Zlotnikova, Bada, & Kalegele, 2016). According to Kihoza et al., (2016), the SAMR model is based on the theory that technology integration into classroom practices transforms or enhances traditional pedagogies through the use of new technologies, either through the substitution, augmentation, modification or redefinition of educational tasks. The information provided by the participants in the study revealed that they were primarily using the technology for pedagogical practices at the substitution and augmentation level of SAMR. Furthermore, when asked about the differences in students' learning experiences, participants described integrating technology in ways that corresponded with the substitution and augmentation levels of SAMR.

Data from this study very closely aligned with the research reported by Karchmer-Klein, Mouza, Harlow Shinas, and Park (2017). While all participants in the study were willing to integrate the technology into pedagogy, there were differences between teachers' *perspectives* of integration and their *actual* integration of technology into their

pedagogy. Similarly, in this study, teachers' perspectives of integration were different from their actual integration levels.

Participants were asked about their perspectives on students' current learning experiences with technology as compared with students' experiences before one-to-one technology was introduced. Participants revealed perspectives about increased student-centered learning experiences now compared to teacher-centered instruction before one-to-one technology. Moreover, participants were asked to provide specific examples of how they engaged in pedagogical practices that emphasized the 21st-Century skills of creativity, communication, collaboration, and critical thinking among students. Eleven participants were able to provide specific examples of how they incorporated the 4Cs into students' learning experiences.

Theme 2

Core content teachers exhibited generally positive attitudes and beliefs towards technology integration. The second research question asked about the perspectives of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy. Based on participants' responses, I defined perspectives as statements that gave examples of a teachers' attitude toward or way of regarding something, point of view, or opinion. The following pattern codes emerged from the participants' responses: *digital integration specialist, would not want to teach without technology, technology increases ease and efficiency, benefits of technology, convenience,* and *positive attitudes*.

Participants communicated generally positive attitudes towards technology because of the ease of its use. According to Admiraal et al. (2017), perceived ease of use refers to the degree to which teachers think the technology will be relatively free from effort. The participants unanimously stated that technology integration made their teaching experiences easier and more efficient. The terms *easy*, *easier*, or *ease* was used by all twelve participants at some point during the interview when describing how technology integration had changed their teaching experiences. Additionally, participants described the convenience of using G Suite resources to provide instant feedback to students and track students' progress, as well as manage curriculum, assignments, and grading, all in one place. Many participants stated that G Suite tools increased efficiency by making work more organized for both teachers and students.

The majority of the participants stated generally positive views about the role of technology professional development as a key component of their learning experiences. The data related to this theme aligned with the empirical research in the literature review by Harper and Milman (2016) that teachers who viewed technology integration as an opportunity to create authentic student-directed learning environments tended to integrate it into pedagogy. Additionally, research by Vongkulluksn, Xie, and Bowman (2018) corroborated Harper and Milman's findings that teachers' perspectives had a direct association with teachers' technology integration into pedagogy. In this study, the participants reported an overall positive attitude regarding technology integration. Furthermore, participants shared similar descriptions of integrating technology in ways that corresponded with the substitution and augmentation levels of SAMR.

Theme 3

Core content teachers faced challenges with effectively managing student behaviors. The third research question asked about the challenges of high school teachers in core content areas (mathematics, science, social studies, and English) in the local district with integrating technology into their content-specific pedagogy. Based on participants' responses, I defined challenges as statements that gave examples of obstacles to overcome. The data gathered from the participant interviews regarding their challenges with integrating technology to transform pedagogy and students' learning experiences align with Research Question 3. Participants described difficulties they experienced integrating technology to transform their subject-specific pedagogy and students' learning experiences. They also shared how they overcame these difficulties. The following pattern codes emerged from the participants' responses: *decisions about how to integrate technology, more training needed for students, classroom management, students not proficient with using technology, digital citizenship,* and *digital tools to monitor students' work.*

Although the participants in the study recognized the benefits afforded by the one-to-one technology, there were also many challenges that accompanied these benefits. The participants all shared similar difficulties related to digital citizenship when it came to integrating technology to transform students' learning experiences. Some teachers, however, still noted that they were learning to overcome the challenges of effectively managing student behavior through the use of digital tools, such as Hapara©, which allows teachers to view students' browsing activity during class.

Many of the challenges mentioned by the teachers mirror the literature on classroom management with technology integration. According to Cho, Mansfield, and Claughton (2020), despite the importance of technology integration in the digital-age, some teachers may find it difficult to maintain orderly and productive classroom environments. Further, professional development for teachers in classroom management often occurs in the context of school-wide discipline trainings (Marquez et al., 2016). However, there is a pressing need for educators to understand classroom management as it relates to managing student behavior during technology integration (Cho, Mansfield, & Claughton, 2020). The participants in this study expressed a need for additional training for students on how to use technology for academic purposes. Therefore, participants in this study would benefit from additional professional development on classroom management specifically related to technology integration.

Major Evidence from Literature and Research

The literature review supported recommendations for professional development to support teachers' knowledge and use of TPACK to develop transformative pedagogical practices and improve digital citizenship. Based on the themes that emerged from the interview data, it was evident that many of the participants' pedagogical practices remained unchanged. It was also evident that teachers needed support with challenges related to managing student behaviors when integrating technology. Therefore, professional development is recommended to address the teachers' pedagogical needs and resolve the challenges they expressed during the study.

The emerging literature on teacher education identified the TPACK framework as the foundation for teachers to unpack the skills and knowledge needed to design lessons for the 21st-Century classrooms (Koh, Chai, Benjamin, & Hong, 2015; Mishra & Koehler, 2006; Valtonen et al., 2017). However, proponents of the framework posit that TPACK may not help teachers in their day-to-day practice (Dobozy & Campbell, 2016). Current research indicates that the emergence of TPACK has not transformed teaching and learning (Heitink, Voogt, Fisser, Verplanken, & van Braak, 2017; Koh, Chai, & Lim, 2017; Pringle, Dawson, & Ritzhaupt, 2015). Therefore, the research supports the findings in this study.

The participants in this study reported challenges with integrating technology to transform their pedagogical content knowledge (PCK) beyond traditional content delivery. Specifically, many of the participants reported relying heavily on direct instruction, modeling, and the use of cooperative groups with little to no change in pedagogy. The SAMR model encourages teachers to integrate technology knowledge (TK) into pedagogical content knowledge (PCK) according to a four-level approach. The structure of the SAMR model represents technology integration as belonging to one of four categories. According to Hamilton, Rosenburg, and Akcaoglu (2016), the SAMR model encourages teachers to “move up” from lower levels of technology integration – substitution and augmentation – to the higher levels of modification and redefinition. It is at the higher levels of SAMR that teaching and learning is transformed. The technology in the local district was being integrated at the substitution and augmentation levels of SAMR, resulting in little to no transformation of students' learning experiences.

Therefore, specific research into how to equip local teachers for such transformations is still needed, especially since current technology integration efforts generally support traditional learning (Pringle et al., 2015; Tondeur, Aesaert, et al., 2017). Transforming students' learning experience requires that teachers be provided with professional development experiences that will reframe their current knowledge, challenge them to rethink, unlearn and relearn, change, revise, and adapt their current pedagogical practices.

Research supports the findings in the study that teachers had knowledge of technology (TK) and integrated technology for instructional purposes; however, the process of student learning may not be transformed when the emphasis is on the technology-based product instead of the instructional objectives and learning outcomes (Hamilton, Rosenburg, and Akcaoglu, 2016). To support and transform students' learning experiences, teachers in the local district need professional development on how to use the SAMR model in their specific content areas.

The participants in the study expressed generally positive views about the role of technology professional development as a critical component of their learning experiences. Research by Zmuda, Curtis, and Ullman (2015) reported that one of the most significant contributors to the acceptance and success of technology integration is the preparation teachers receive through professional development opportunities. Similar to the teachers in the study by Zmuda et al. (2015), many of the teachers in in the local district attributed technology professional development, collaboration among peers, and

expert training provided by the school's digital integration specialist at critical to their success.

Strategies for professional development include workshops, expert training, collaborative learning communities among peers, and shared decision-making (Fenton, 2017). Professional learning through regular, relevant, and ongoing professional development workshops support positive pedagogical changes (Albion, Tondeur, Forkosh-Baruch, & Peeraer, 2015; Hall & Trespalacios, 2019; Zmuda, Curtis, & Ullman, 2015). Additionally, the way professional learning is delivered can provide the framework, experience, and understanding to support teachers' self-efficacy toward implementing what they learn. However, the professional development needs of the teachers may change over time.

Changes in Professional Development Needs Over Time. Fenton (2017) conducted a study to identify professional development activities that were critical for integrating one-to-one technology and what was needed to sustain the use of the technology beyond the first year. In the study of 191 teachers who were in schools with one-to-one adoption programs, Fenton found differences between the professional development activities needed for first-year integration versus what was needed to sustain integration beyond the first year.

During the first year, teachers reported that they needed professional development on how to use the devices and how to manage the use of devices in the classroom. As teachers became more comfortable with the devices, they reported that professional development topics on instructional strategies were needed to sustain use beyond the first

year. Furthermore, a significant theme that emerged from the study was teachers' perspectives about how professional development was delivered (Fenton, 2017). The teachers in Fenton's study reported challenges with having large-group professional development or a one-size-fits-all approach. Teachers have varied abilities and expertise (Weinhandl & Lavicza, 2019). In the study, teachers reported success when professional development was delivered in small groups and differentiated based on teachers' needs.

Weinhandl and Lavicza (2019) reported similar results in a study. Often, teachers in professional development form heterogeneous groups that differ in experiences, knowledge, attitudes toward the subject, technologies, or the learning process. The findings by Weinhandl and Lavicza indicated that in order for professional development to meet the diverse needs of teachers, it should not be based on lectures. Instead, teachers should be actively involved in hands-on activities that have relevance to their content areas. Hands-on professional development provides opportunities for teachers to transfer the training content into practice. Furthermore, teachers are more likely to integrate technology into their pedagogy when professional development aligns with the content they teach (Fenton, 2017).

Collaborative Learning Communities. In a study of 191 teachers in secondary classrooms from districts with one-to-one technology integration programs, Fenton (2017) found that time to collaborate with colleagues and learning from peers on how they integrated technology, led to sustained technology integration. According to Fenton, "collaboration with peers and work time was more important to teachers than one-on-one coaching or large group professional development" (p. 165). One conclusion from the

study was that opportunities for teachers to learn from other teachers about how to integrate technology into content-specific pedagogy were critical for professional learning.

The need for collaboration was a significant finding in other technology integration studies (Longhurst, Jones, & Campbell, 2017; Weinhandl & Lavicza, 2019). In studying factors that impact teacher implementation of learning from professional development, Longhurt, Jones, and Campbell found collaborative teacher-peer communities to be an emerging theme. The data suggested that trusted teacher-peer communities connected to how teachers modified and ultimately developed ownership of their pedagogical practices. The results of the study indicate a need to create collaborative learning communities that foster individual growth.

Similarly, Jaipal-Jamani and Figg (2015) reported teacher collaboration as a striking characteristic of technology professional development. In a study of TPACK-based professional development activities, teachers reported that they preferred collaborating with peers over formal professional development sessions. Teachers also preferred to have professional development sessions conducted during planning time and at a place convenient for collaborating with other teachers.

Benefits of Professional Development on TPACK Pedagogical Practices. Although the local district had already discussed TPACK as part of technology professional development, the interview data from the study revealed that although teachers could demonstrate technical skills and tool use, they still needed support with developing technology-enhanced pedagogy that would transform students' learning

experiences. In other words, the participants in the study had technology knowledge (TK), but did not integrate technology into their content knowledge (CK) in ways that transformed their pedagogical knowledge (PK). Hence, professional development where teachers develop their TPACK to promote student learning of specific content is needed.

According to Jaipal-Jamani and Figg (2015), TPACK-based professional development activities are more effective than professional development where teachers learn technical skills in isolation from their content. Additionally, situating the learning of technology integration in an authentic learning activity that can immediately be used in pedagogy supports the transformation of students' learning experiences. For example, professional development for mathematics teachers in the local district on having students find and research real-life graphs and then creating their own multistep linear equations to share on digital platforms for class discussions provides a concrete example of how mathematics teachers can integrate technology knowledge (TK) into pedagogical content knowledge (PCK) at higher levels of SAMR. This type of professional development is considered a content-centric approach, and the teacher knowledge developed through this approach is referred to as TPACK (Mishra & Koehler, 2006). Furthermore, according to Jaipal-Jamani & Figg, such an approach to professional development builds teachers' pedagogical knowledge (PK) about how to integrate technology knowledge (TK) with content knowledge (CK) to meet authentic curriculum learning goals.

In a case study to gain insights on how teachers experienced learning to design and teach with technology through a TPACK-based professional development approach,

Jaipal-Jamani and Figg (2015) found that the learning of technology knowledge (TK) is effective when situated in authentic, content-centric learning activities. The findings of the study suggested the need to provide an immediate "application-in teaching" phase to help teachers transfer the technology knowledge (TK) they receive in professional development into real-time pedagogical practices. Moreover, Jaipal-Jamani and Figg posited that "a TPACK-based, content-centric model of technology professional development, as opposed to a focus on teaching technical skills in decontextualized contexts" (p. 188), was effective at developing aspects of teachers' TPACK. Additionally, the teachers in the study were better able to integrate TPACK in relation to the actual needs of the learners.

In addition to meeting learners' needs, technology integration also has the potential to help students gain digital literacy and 21st-Century skills such as the 4Cs – communication, collaboration, creativity, and critical thinking. Many of the participants in this study stated their intentions to integrate technology to create real-world learning experiences for students that incorporated opportunities for engagement in the 4Cs. Furthermore, all participants in the study were willing to integrate the technology into pedagogy. However, teachers' intentions to integrate technology in transformative ways differed from the ways they actually integrated technology into students' learning experiences.

Several research studies on the integration of technology in pedagogy indicated that there might be misalignment between teachers' intentions and their actual practice (Karchmer-Klein, Mouza, Harlow Shinas, & Park, 2017; Sadaf, Newby, & Ertmer,

2016). According to Sadaf, Newby, and Ertmer (2016), several enablers and challenges can affect how technology is integrated. For example, teachers' positive attitudes, access to technology, and support from other teachers often serve as enablers. On the other hand, lack of content-specific resources, classroom management and the misbehaviors of student learners often serve as challenges that impede transformative integration of technology.

Classroom management with one-to-one technology emerged as a challenge for core content teachers in the local district. Many of the teachers reported a need to train students on how to use technology for academic purposes. Additional challenges that emerged from the interview data included students not being proficient with using technology, classroom management, and digital citizenship. Similar challenges were reported in a phenomenological research study by Heath (2017) in which a teacher reported that her students did not demonstrate a "native ease" when using tablets for educational use. She reported that her students were digital natives only when it came to social media, but not when it came to academic software programs. In the study by Heath the educator regrouped, changed her approach to instruction, and trained the students on how to use technology to manipulate subject-specific content and produce educational content.

According to Cho et al. (2020), many teachers have responded to similar challenges by embracing technologies for classroom management. For example, the ClassDojo© application was launched in 2011, but is now used in at least 90% of K-8 schools in the United States (ClassDojo, 2017; Williamson, 2017). The ClassDojo©

application digitizes a token economy method such as those found in multi-tiered behavioral approaches to incentivize digital citizenship among students. In the local district, many of the participants in this study reported improved classroom management with the use of a digital platform called Hapara©. There is a continued need for teachers in the local district to connect how technology can be used to support classroom management. Additionally, the introduction of tools intended to support students with self-discipline and self-regulation by helping them monitor and reflect on their own behaviors would support the local district's goal of preparing students to be 21st-Century learners.

According to Shyr and Chen (2018), many students find it difficult to be self-regulated in order to complete tasks in technology-based environments without external supports. Students often lack self-regulation abilities to control behaviors, emotions, and thoughts. Therefore, it is important for teachers to develop strategies that support self-regulation while students are working in technology-based environments.

Recommendations

The recommendations made in this position paper originate from the findings from the teacher interviews and an extensive literature review. Each recommendation would allow district officials to maximize support opportunities to teachers in the area of technology integration without exhausting significant financial resources. Additionally, recommendations are provided in each area identified in the study as a gap between theory and practice.

A key recommendation is for district-level leaders to consider implementing professional development for teachers to build on their existing TPACK to shift pedagogical practices to higher levels of SAMR. In order to build the capacity of teachers to integrate technology in transformative ways, district leaders should provide TPACK-based professional development that includes input from teachers and supports from digital integration specialists and the district's content-level coordinators. It should be content-centric and allow hands-on collaboration with peers. Furthermore, to help teachers face challenges with effectively managing student behaviors, professional development should include instructional and classroom management strategies that teachers can immediately transfer into practice.

The data from participants' interview responses in this study revealed a need for the local district to reexamine the nature of the current professional development approach as related to technology integration and the types of learning activities included in such professional development. The local district commonly chooses a workshop approach to conduct technology professional development. These workshops focus on the demonstration of technology knowledge (TK) in isolation from the teachers' content specific pedagogical knowledge (PCK). Such an approach leads to technology knowledge (TK) being learned outside classroom context, thus resulting in teachers finding it difficult to connect the technology knowledge (TK) learning to subject area content knowledge (CK) and classroom pedagogical knowledge (PK) (Jaipal-Jamani & Figg, 2015). Hence, for professional development to effectively promote TPACK – in a way that transforms pedagogy and students' learning experiences – professional development

should be situated in content-centric ways that allow collaboration with peers and ongoing support from the digital integration specialist.

To build on the existing generally positive attitudes and beliefs teachers hold towards technology integration, the district should continue existing practices that teachers reported as beneficial to their professional growth. For example, following each professional development opportunity, there should be time for teachers to learn from and observe peers and develop their individual growth. Additionally, professional development should occur during teachers' planning time and be convenient for teachers to learn collaboratively. Throughout the year, core-content teachers of students in Grades 9 through 12 and district-level administrators should assess professional development to determine the achievement level of the targeted outcomes of integrating technology into content in ways that transform pedagogy and students' learning experiences.

Project Goals

The desired outcomes of this project are that

- Teaching and learning practices founded on epistemological assumptions and pedagogical research of the last century will be reconstructed.
- Classroom pedagogical practices and teachers' pedagogical competencies will be transformed.
- Awareness among teachers regarding how TPACK can be used to transform lessons for 21st-Century classrooms will be increased.
- Opportunities for students in Grades 9 through 12 to engage in 21st-Century learning centered on the 4Cs will be increased.

- Technology professional development anchored upon the pedagogical goals of 21st-Century learning and focused on teachers' TPACK will be developed.
- Teachers' classroom management strategies and students' classroom behaviors will be improved.

The overall goals are to track

- the implementation of the recommendations by district-level leaders;
- the development of TPACK professional development to help teachers integrate one-to-one technology in transformative ways;
- teacher implementation of strategies taught in professional development;
- transformations to teachers' pedagogical practices based on TPACK and SAMR as a result of professional development; and
- if teachers experience changes with managing student behavior as a result of strategies learned through professional development.

Conclusion

The purpose of this position paper is to provide insights and recommendations to leaders in the local setting regarding teachers' experiences and perspectives about integrating technology into their content areas in ways that transform pedagogy and students' learning experiences. The recommendations in this paper have the potential to affect policies and practices at the local level. There is a potential for district-level leaders and local policymakers to improve professional development opportunities in ways that are responsive to the experiences, perspectives, and challenges identified by teachers in the

local district. This project also has the potential to equip teachers better to integrate technology in ways that transform pedagogy and students' learning experiences.

Appendix B: Responsive Interview Protocol

Introductions:

I'd like to thank you once again for being willing to participate in the interview aspect of my study. I am a graduate student in Curriculum, Instruction, and Assessment at Walden University and am conducting research as part of the requirement for a Doctorate Degree. My study seeks to examine the experiences and perspectives of high school teachers regarding technology integration. I will use the information as data for my dissertation. Your identity and the interview will remain confidential and you will not be identified in the study.

Our interview today will last approximately 45-60 minutes during which I will be asking about your perspectives regarding integrating technology into your pedagogy. There are no right or wrong answers; I am just interested in what you think. [review aspects of consent form]

Do I have your permission to audio record our conversation today?

If yes: Thank you!

If no: Thank you for letting me know. I will only take notes of our conversation.

Before we begin, do you have any questions? [Discuss questions]

If any questions arise at any point in this study, you can feel free to ask them at any time. I would be more than happy to answer your questions.

Main Questions, Probes, and Follow-Up Questions:

To begin this interview, I'd like to ask you some questions about your background.

1. Please tell me a little bit about yourself.
    a. For how many years have you been a classroom teacher (cumulative years)?
    b. What grade(s) do you teach?
    c. Which of the following disciplines do you primarily teach (mathematics, science, social studies, English)? Please select the discipline based on the greatest number of years in that discipline.
    d. How long have you been teaching in this school?
    e. How long have you been teaching in a one-to-one classroom?
    f. Describe the teaching method(s) you generally use for classroom instruction in a typical lesson (e.g., direct-instruction, group work, etc.).

Next, I'd like to ask you about your experiences as a high school teacher in the local district with integrating technology into your (insert specific content area)-specific pedagogy (RQ1).

2. Could you tell me about the technologies you integrate into your (insert specific content area) pedagogy?
    a. Are you integrating technologies into your instructional methods?
        i. If yes, how do you decide which technology to integrate into your teaching methods?
            1. What do you need to know to select the appropriate technology for the subject-specific content you teach?

2. Give me an example of the technologies that you integrate into your teaching methods.
3. When it comes to integrating technology, how do you choose activities to integrate into the subject-specific pedagogy?
4. Describe for me what technology integration into your teaching methods looks like in your classroom? Please give me examples of specific classroom activities.

ii. If no, what prevents you from integrating technologies into your teaching methods?

1. Tell me more…
2. How did you feel …
3. What do you mean when you say…?
4. Explain that to me a little bit more.

b. What do you like/dislike about integrating technology into your teaching methods?

3. Describe how you developed your knowledge about how to integrate technology into your pedagogy when the one-to-one technology was first introduced?

Next, I'd like to ask you about your perspectives about integrating technology to transform pedagogy and students' learning experiences (RQ2).

4. Tell me about the ways you think your instructional methods have changed as a result of technology integration.

5. Before the introduction of one-to-one technology in your classroom, please describe to me the teaching methods you used in your (insert specific content area) classroom?
6. How would you describe students' learning experiences in your (insert specific content area) classroom before the introduction of one-to-one technology?
7. Could you tell me about the differences in your pedagogy between now and prior to the introduction of one-to-one technology in your classroom?
    a. Please describe.
8. Could you tell me about the differences in students' learning experiences between now and prior to the introduction of one-to-one technology in your classroom?
    a. Please give me an example.
9. How do you, in your capacity as a (insert specific content area) teacher, engage in pedagogical practices that emphasize creativity, communication, collaboration, and critical thinking among students?
    a. Please give me examples.

Next, I'd like to ask you about any difficulties you experienced integrating technology to transform pedagogy and the learning experiences of your students (RQ3).

10. What difficulties did you experience when integrating technology into your (insert specific content area) pedagogy?
    a. How did you overcome these difficulties?

11. What difficulties did you experience when integrating technology to transform the learning experiences of your students?
    a. How did you overcome these difficulties?

Probes

The following prompts will be used as probes to seek clarification or expansion of the participant's responses (Guest, Namey, & Mitchell, 2013; Rubin & Rubin, 2012; Toledo, 2015):

- Give an example of …
- Go on…
- Tell me more…
- Describe…
- How did you feel in that situation…?
- What do you mean when you say…?
- Explain that to me a little bit more.
- You mean…?

Closing the Interview

Before we conclude this interview, do you have any additional perspectives about integrating technology to transform your pedagogy and students' learning experiences that we have not yet had a chance to discuss?

This has been great. Thank you for your responses. You have given me a lot to think about.

Appendix C: Sample Researcher's Journal Entries

January 7, 2020

Today was the first day of data collection for my project. My first interview was a 50-minute discussion with Participant 1, a social studies teacher at the local high school. The overall flow of the discussion went well. I felt very scripted and am hopeful that the ease and flow of how I speak to participants will improve as I conduct more interviews. I did not want to omit any important information or forget to ask questions, so I relied heavily on reading my scripts when asking questions.

I noticed that during the interview, the participant wanted reassurance that she was answering the questions correctly. I feel that I did not respond in a manner that would cause bias or lead the participant on. For example, at one point during the interview, the participant asked, "Is that too vague?" I responded, "No, that's good." I am not sure I should have stated, "good" but I did not want the participant to feel compelled to modify her response.

My initial takeaways from her responses are (1) her positive attitude toward technology integration, (2) strong support provided by the school and district to encourage and teach teachers how to use technology, (3) the importance of PD, and (4) the significant role of the school's digital integration specialist. During the interview, my initial thoughts about her TPACK development were that her technological (TK), pedagogical (PK), and content knowledge (CK) components were still viewed in isolation of each other. However, the participant seemed very knowledgeable about TPACK. I

wonder if this is a natural and realistic progression of how teachers work their way to full TPACK. How long does it take to reach full TPACK? Is it realistic that TPACK happens instantaneously, or does it build progressively with support? This is the first time I've reflected on the fact that reaching TPACK is likely a progressive process.

I am very interested to see how other participants convey their integration of technology integration. The participant also used the term 'ease'. This made me think of SAMR. I am not sure if the technology is being used to modify or redefine teaching and learning or if it is being used to substitute and augment what was already being done. The participant's statement that the walls of her classroom fall down with technology also stood out as significant to me. Overall, the participant was confident, knowledgeable, and supportive of technology integration.

January 9, 2020:

I completed the second and third interview today with Participant 2, a social studies teacher, and Participant 3, a mathematics teacher. Today's interview with Participant 2, the social studies teacher, lasted for 47 minutes. The overall flow of the interview went well, and I felt more comfortable and confident interacting with the participant. Her perceptions were very similar to those held by Participant 1. She had an overall positive perspective of technology, and felt that it improved "workflow." This made me think again about if teachers are integrating the technology at the lower levels of SAMR or at the higher levels of SAMR. Something that really grabbed my attention with this participant's responses is her statement that a lot of her instructional methods have "stayed the same." Although the participant integrates technology and was able to

provide many in-depth examples of pedagogical practices using technology with her statements, she specifically said that the technology was a “tool” to “enhance” her teaching methods. My mind immediately raced to SAMR. I wondered about her awareness of the SAMR levels. Like Participant 1, Google Suite is a big part of technology integration in her classroom. In reflecting on her challenges, it seems as if determining what is worth investing time and energy integrating is a big challenge for her. I did a better job today with inserting probing questions to get further insights.

Participant 3 was a mathematics teacher. Before the interview, I reflected on my background research that math teachers relied more heavily on traditional teaching methods. I was aware of my expectation that this math teacher would be more traditional in his approach; and made sure to be intentional about reminding myself not to interject any biases into my interactions or interpretations of the data. I reviewed the script before the interview to make sure I was confident and prepared to engage in an unbiased manner. In reflecting on the data, the participant did not state traditional views of teaching and learning. Instead, the participant’s perspectives were very similar to those held my Participant 1 and Participant 2. Participant 3 integrated a variety of digital tools and held a positive perspective about the benefits of technology for both teaching and learning. The participant shared that it increased his ability to be accessible to students. This participant also demonstrated how he organized information (note to self – remember that organization keeps coming up) using Google classroom (note to self – Google is another code that keeps coming up). I wonder if this math teacher’s perspective will be discrepant compared to the other math teachers? Professional development stands

out as a preliminary code. Also, regarding challenges, this participant was the first so far to discuss his preference for iPads over the current Chromebooks, so much so that he mentioned writing a grant to get a class set of iPads, although the school now provided one-to-one Chromebooks. I wonder if the preference of the type of digital tool (iPad versus Chromebook) is a content-specific preference? During the interview, I thought about SAMR again and how many of the examples provided by the participant reflected lower levels of SAMR. The challenges mentioned by this participant were different from Participant 1 and Participant 2. The main challenges for Participant 3 seemed to be the classroom management with students and functionality of Chromebooks for manipulating math-based content.