2018

Increasing Collaboration, Shared Values, and Authentic Teaching Practices Through Technological Professional Development

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Walden University
2018

Abstract

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by

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MS, Walden University, 2006

BS, Cameron University, 1996

Project Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

October 2018

Abstract

The purpose of this outcome-based program evaluation project study was to investigate how professional development (PD) influenced the shared values of 25 district teachers regarding instructional technology and their collaboration and instructional practices using instructional technology. Inclusion criteria included (a) participants had to be 18 years or older and (b) participants had to be a certified teacher. Guided by Mishra and Koehler's TPACK theory and Guskey's model for PD evaluation, the research was designed to determine (a) how teachers demonstrate collaboration using instructional technology as a result of PD, (b) what shared values teachers have adopted regarding instructional technology as a result of PD, and (c) how the authentic teaching practices of participants have changed because of the technology PD. Data were collected through Likert surveys, interviews, and classroom observations. Data analysis included descriptive statistics for the quantitative portion, and identification of emerging themes for the qualitative portion. The results reflected ways technology is being implemented into instructional strategies. The implication of this study for social change includes support for including collaboration and shared values in professional development to improve instructional strategies incorporating technology, which can lead to improved learning environments. Teachers and the school can benefit by having the knowledge of how technology and PD provided by the OETT grant enhanced instruction. Social changes that may occur due to the findings of this study include the school gaining a better understanding of the influence of technology in instruction on student learning and identifying tools that potentially increased teacher uses of the technologies purchased as well as teacher application of the knowledge gained in the PD provided through the grant.

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Dedication

This work is dedicated to my husband, James, and my children, Brittany and Brandon. Thank you for your constant encouragement throughout this journey. You are my biggest blessings in life. I also dedicate this work to my granddaughter, Emma. Mimi finally has lots more time to play. Lastly, it is dedicated to my son-in-law Stephen, and future daughter-in-law, Rachil. Thank you for enduring this crazy ride of life with us. Thank you to my entire family for your constant support and encouragement along the way. Thank you all for your prayers and faith in me.

Acknowledgments

With God ALL things are Possible!

I would like to thank my committee chair, Dr. Marcia Griffiths-Prince, for your guidance and support during this journey. Thank you to my committee member, Dr. Sunddip Aguilar, for your insight and support. I would also like to thank my editor, Allison Lawson.

Special thinks to my friend, Classie Nolan, for always encouraging me to keep going. From cheerleader, to reading drafts, to helping with edits, I could count on you!

Thank you to my friend, Erica Nevenglosky, for keeping me focused and grounded along the way. We began this doctoral journey as classmates who didn't know each other, and ended up roommates at Residency. We had many laughs, and even a few tears; but now, here we are Doctors, and more importantly, friends!

I would like to thank Lynett Rock. You are more than a boss, you are a colleague and friend. From fixing my page numbers for the millionth time, to reading drafts and offering input, you've been there. Thank you!! You're next!

I would also like to thank my friend, LaTonya Eaford. No matter how many times I thought I would never be able to finish, you were to there to assure me I could do it. You often told me the hardest step was behind me. Now, I can truly say, the hardest step IS behind me.

Thank you to my CIA friends and family: Denise, Jenny, Kathy, Deborah, Kelly and many more. Thank you for your support throughout this journey.

Lastly, I would like to thank the participants of this study who gave of their time to further my research.

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Section 1: The Problem

Introduction

Freedom View Middle School (FVMS; a pseudonym) needed educational technology and tools to enhance teacher instruction and student learning. FVMS needed additional technology to have a 1:1 ratio of students to technology devices, and professional development (PD) was needed to teach teachers how to use technology and tools. To meet this need, FVMS applied for and received an Oklahoma Educational Technology Trust (OETT) grant. According to the principal of the school, prior to receiving this grant, 60% of teachers at FVMS were using little to no technology in their teaching practices. This grant provided both technology and PD instruction on the technology and tools. However, there had not been an evaluation of how the technological PD influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. This study was conducted to examine whether PD provided by the OETT grant influenced teachers' use of technology in their instruction as well as their shared values and collaboration.

Background

The OETT grant is provided by the K20 Center and offers technology as well as PD to schools within the state of Oklahoma. This grant provided $40,000 for instructional technology and an additional $25,000 (valued) in PD for teachers and administrators in the school examined in this study. The purpose of this funding source is to provide a network based on collaborative research and outreach that can create and sustain innovation and transformation efforts through leadership, shared learning opportunities,

and technology integration (K20 Practices of High Achieving Schools, 2016). This grant also addresses a lack of technology in the school district and a lack of knowledge on technology in the curriculum.

The OETT grant requires schools to develop a collaborative proposal for implementing three of the 10 identified practices evident in high achieving schools (K20 Practices of High Achieving Schools, 2016). The three practices selected by the local school in this study were increased teacher collaboration, shared values, and authentic teaching practices. The goal of the OETT grant for FVMS was to implement instructional strategies using technology in the classroom through these three practices. Based on information from the principal, goals listed on the Oklahoma OETT grant application included to acquire technology resources for hands-on, mobile learning by students to increase academic achievement; to provide PD on research-based strategies to increase student academic achievement through technology-integrated authentic instruction; to further develop professional learning communities; and to use technology and Web 2.0 tools and resources in authentic ways incorporated into the curricula of the school. According to the OETT grant application for FVMS:

> All teachers take part in PD that is continuous, job related, and of the highest quality. In order to encourage higher order thinking skills and hands-on learning for students, monthly training is utilized by PLCs to create authentic instructional units and analyze data. This data is used to address weaknesses in student achievement. Everyone in the community including school board, administration, teachers, and parents desire for students to be successful and therefore share

common values, goals, and purposes. These values, goals, and purposes include a shared vision of technology. Making connections to the real world and moving beyond the textbook is needed to increase authentic instruction.

A collaborative Google Doc was created by the principal and shared with teachers to highlight current practices of how technology is used to facilitate authentic instruction.

According to the principal for FVMS, the previous ratio for student to technology devices was 2:1. Previous technology included two computer labs with 21 and 28 computers, a mobile laptop cart with 24 laptops, and 20 Thinkpads. According to the (OETT/OK-ACTS) grant application, 76% of the student body at FVMS lives below the federal poverty guidelines. Many students do not have the ability to use technology outside of the classroom. Therefore, FVMS needed additional technology to have a 1:1 ratio of students to technology devices. PD was also needed to teach teachers how to use technology and tools.

The Local Problem

The problem at FVMS was that it was unknown whether training was successful for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. It was also unknown what influence PD had on teachers' implementation of instructional strategies while incorporating technology with three of the 10 selected practices of high achieving schools. This study was conducted to address these problems and evaluate the effects of the PD on teachers' shared values, collaboration, and instructional practices regarding instructional technology.

Prior to this receiving the OETT grant, 60% of teachers at FVMS were using little to no technology in their teaching practices. FVMS only had a 2:1 ratio of technology, and according to the head of the Language Arts department, many of the teachers did not know the new tools existed prior to the PD provided by the grant. The grant addressed this need for technology as well as the need for knowledge of technology in instruction.

The need for technology was established for the grant through the demographics of the students. In 2015, the school consisted of 177 students in Grades 6-8. Of those students, 84 students were Hispanic (46.9%), three students were American Indian (1.7%), three students were Asian (1.7%), 17 students were Black (11.2%), zero students were Pacific Islander (0%), and 70 students were White (39.1%). Along with the diverse ethnic population, most of the students' families had socioeconomic status that showed a need for the OETT grant. Most of the students qualified for the free or reduced price lunch program. Of the 177 students at FVMS, 126 students (71.2%) qualified for free lunch, and 22 students (12.4%) qualified for reduced price lunch. This was a total of 148 students (83.6%) who were living below the federal poverty guidelines.

In this school in which 83.6% of the student body lived below the federal poverty guidelines, many students did not have the ability to use technology outside of the classroom. FVMS needed additional technology to have a 1:1 ratio of students to technology devices. This funding enhanced the curriculum by providing technology: 87 Samsung Galaxy 4 tablets, eight Mobi interwrite tablets, and two iPad Air tablets with a stand and holder for video production. The grant also provided PD to increase teacher knowledge and use of this technology. This PD included the K20 center traveling to the

local school once a month to present new tools such as web 2.0 apps and Google tools, providing training for these tools to increase effectiveness and usability. The training was to teach teachers to incorporate the technology into teaching practices to create authentic teaching practices. For example, a language arts teacher having the students use We Video after they finished reading a novel to do a book promo to entice other students to read the book. In addition to the PD provided by the grant, FVMS recognized a need for shared values and teacher collaboration at both the administration and teacher levels. The district began early release days on the first Wednesday of each month in 2009. These days were set aside for staff development, which included teacher collaboration as one of the goals the staff identified in their OETT grant application.

Educators face barriers when attempting to implement technology in the classroom. For instance, researchers have claimed that too much lecture is used in teaching science subjects in secondary schools, which can lead to low achievement (Oluwatumbi, 2015). However, teachers face extrinsic and intrinsic barriers (Ertmer, 1999). Extrinsic barriers include lacking technical support, training, resources, and time. Intrinsic barriers include beliefs, attitudes, and views teachers have about knowledge, learning, and teaching. FVMS addressed the extrinsic barriers by providing $40,000 in technology and addressed the intrinsic barriers by providing PD, valued at $25,000, through the OETT grant.

Further evidence of the local problem was outdated technology and a lack of technology that the OETT grant addressed. New programs were available to enhance student learning; however, the technology available was too old to run the new programs.

The OETT grant provided a means for purchasing newer technologies that would support the newer programs and enhance student learning. This also helps students' future success, as technology use will help them in college or the workplace. In addition to outdated technology, there were not enough computers and technological devices for students to regularly use the technology, which led to teachers not using the technology in instruction. A lack of knowledge in the use of technology in the classroom also contributed to teachers not using the technology on a regular basis. Both the lack of technology and lack of knowledge were addressed by the OETT grant; however, there was a need to evaluate how this grant improved instructional practices regarding technology.

Integral parts of the evaluation were key components of the grant proposal addressing shared values, collaboration, and authentic teaching. To be considered for this grant, the principal had to complete OK-ACTS Phase I Leadership (K20 Practices of High Achieving Schools, 2016). This administrator attended a 2-day leadership seminar and two cluster meetings. A technology assessment was completed, and one action plan was submitted. Lastly, an OETT/OK-ACTS Grants to Schools application was developed and submitted. According to a department head at the school, it was important to know teachers in her department, as well as other departments, were collaborating effectively. As an administrator, the principal of FVMS needed to know how the PD influenced teachers' shared values, collaboration, and instructional practices using instructional technology.

Rationale

Technology can improve classroom instruction, but there are many barriers teachers face in integrating technology into teaching practices (Hechter & Vermette, 2013). To integrate technology into a curriculum, technology, pedagogy, and content knowledge have to come together in an effective manner (Voogt, Erstad, Dede, & Mishra, 2013). A teacher at FVMS stated, "Specific barriers faced by teachers at [FVMS] include a lack of resources and a lack of training." An eighth grade teacher at FVMS also stated that a barrier was that "available technology was not compatible with current programs." Technology often changes, which means that the life cycle phase of the product occurs at an accelerated pace (Liscouski, 2008). According to the OETT grant application for FVMS, 74% of computers were 5 or more years old and at the end of their useful lives, creating a ratio of one modern computer to 7.5 students. The K20 grant funding provided a means for purchasing newer technologies that would support the newer programs. In a report to the Board of Education, the principal stated, "[FVMS] used funds from the OETT grant to purchase technology, including Samsung Galaxy 4 tablets."

According to a report the principal gave to the Board of Education, training was also arranged to educate teachers on the technology and tools to be used. Due to teachers' lack of knowledge about using technology, 60% of teachers used little to no technology in their instruction. As a result of teachers not using the technology in their instruction, students were not exposed to the use of technology. A teacher at a local college expressed that when students experience little to no use of technology in school, they are unable to

succeed in college or the workplace because technology is part of modern culture The purpose of this outcome-based evaluation research study was to investigate how the PD influenced teachers' shared values, collaboration, and instructional practices using instructional technology.

Definition of Terms

Authentic teaching practices: A multifaceted approach to teaching based on four principles: genuinity, being consistent in values and actions, a relationship with others that encourages them to be authentic, and living a life that is considered critical (Cranton & Carusetta, 2004).

Instructional practice: Teaching methods that teachers use to help students become independent and strategic learners (Health and Life Skills Guide to Implementation (K-9), 2002).

Oklahoma Education Technology Trust Grant (OETT): A grant requiring schools develop a collaborative proposal preparing them to implement three out of 10 practices identified in high achieving schools with a focus on developing a professional learning community through the use of technology integration to increase student achievement (K20 OETT/OK-ACTS Grants To Schools, 2016).

Outcomes-based evaluation: An evaluation determining the results and impacts of an intervention (Patton, 2015).

Professional development: A learning process focused on collaboration which promotes the growth of educators (National Staff Development Council, 2001, as cited in Dunfour, Dufour, & Eaker, 2008).

Shared values: Specific behaviors, attitudes, and commitments that need to be present when attempting to advance the vision of an organization (Dunfour et al., 2008).

Teacher collaboration: Teachers working together to reflect on and improve professional practice (Dunfour et al., 2008).

Significance of the Study

This study was conducted to evaluate whether the training implemented via the OETT grant was successful for supporting the three strategies in the K20 Grant proposal for a school in Oklahoma: teacher collaboration, shared values, and authentic teaching practices. This problem was addressed by investigating how the PD influenced teachers' shared values, collaboration, and instructional practices using instructional technology. As defined in the (OETT/OK-ACTS) grant application, problems included technology that was not compatible with current programs and a need for instructional strategies that would enhance teacher instruction and engage students in learning. Newer programs would not run because the technology was too old, and the teachers needed training on using technology in their instruction. By providing the PD training, the goal of the grant was to increase the percentage of teachers who use technology in their instruction as the teachers' abilities to implement instructional strategies using technology in the classroom increased through shared values, collaboration, and authentic teaching.

In support of the local problem, an evaluation served as the objective for this study. An outcomes evaluation refers to determining the results and influences of an intervention (Patton, 2015). This outcome-based evaluation research supported

instructional practices at the local site by identifying themes associated with technology in instruction. Guskey (2000) identified five levels in terms of evaluating PD:

1. participants' reaction to the PD,
2. amount the participants learned through participation in PD,
3. organization support and change as a result of the PD,
4. how participants apply the new knowledge and skills, and
5. how student learning outcomes are affected by the PD.

Using a Likert-style survey, interviews, and classroom observations, this outcome-based evaluation research addressed all five of these levels. Beneficiaries of this evaluation included teachers and the school in the local community.

Teachers and the school can benefit by having the knowledge of how technology and PD provided by the OETT grant enhanced instruction. This can benefit the teachers and the school by teacher collaboration, one of the three practices selected by the school, to share instructional technology strategies that were successful. Teachers can also benefit by learning how to apply the knowledge gained through the PD. In addition, school leaders can make informed decisions regarding the needs of teachers in the use of technology in the classroom. Findings can lead to positive social change by identifying ways the OETT grant supported instruction using technology as well as shared values and collaboration. Social change can occur when administrators provide PD to teachers focused on implementation of authentic teaching practices that include collaboration and shared values in an authentic learning environment. Additionally, findings can provide a

better understanding of the influence of technology in instruction on student learning and identifying tools that increased teachers' use of technology.

Research Questions

Program evaluation involves studying how a program operates and the outcomes to render a judgment about its effectiveness (Patton, 2015). Research questions were developed to guide this outcome-based evaluation on how the PD provided by the OETT grant influenced the use of technology for instruction. The questions were grounded in Mishra and Koehler's (2006) TPACK theory, as the premise of this framework is that successful technology integration into the curriculum requires a blending of technology, pedagogy, and content (Voogt et al., 2013). TPACK provides a description of teacher knowledge in the areas of content, pedagogy, and technology and how a teacher can draw upon that knowledge (Minshew & Anderson, 2015). This relates to the problem in this study because a program evaluation was used to examine whether the PD increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. The research questions also addressed Guskey's five levels of PD evaluation (Guskey, 2002). The research questions for this study were:

Research Question 1: How do teachers demonstrate collaboration using instructional technology because of their professional development?

Research Question 2: What shared values have teachers adopted regarding instructional technology because of their professional development?

Research Question 3: How have the authentic teaching practices of participants changed because of the technology PD as identified by the principles of TPACK?

Review of the Literature

The need for current technology in the classroom has been documented (Hechter & Vermette, 2013). With technology the product life cycle of the technology (Liscouski, 2008), schools struggle to fund current technology in the classroom (Hechter & Vermette, 2013). To offset this budget deficit, many schools have turned to grants as a source of funding. FVMS, which was the subject of this program evaluation, received an OETT grant during the 2014-2015 school year. Whereas part of the grant addressed current technology needs, the other part of the grant provided PD on use of the new technologies. In this literature review, research was examined that shows the influence of PD on teacher instructional practices, specifically the use of technology and its relationship to collaboration, shared values, and authentic teaching practices. In this study, I used a Likert-style survey, interviews, and classroom observations to collect data. The research was based on an outcome-based program evaluation of PD instruction and the use of technology in instructional strategies. Collaboration, shared values, and authentic teaching practices were the main variables of interest. The literature review contains three subsections: (a) the Conceptual Framework subsection, which includes Mishra and Koehler (2006) TPACK theory as it relates to technology use in instructional strategies and Guskey's (2000) model for PD evaluation; (b) the Review of the Broader Problem subsection, which includes the definition of educational technology, concerns and barriers to technology implementation in instructional practices and benefits to

technology implementation in instructional practices; and (c) the Professional Development subsection, which includes professional development as it relates to the training received through the OETT grant and instructional technology. This section also includes a description of the three variables that are the main variables of interest.

The databases used for the literature review included Education Source, Eric, SAGE Journals, and ProQuest Central. Key terms used for the search included *collaboration, shared values, authentic teaching practices, instructional practices, instructional methods, authentic teaching methods, technology, instructional technology, instructional strategies, educational technology, TPACK, PD,* and *program evaluation*. I did not find a lot of literature when using the terms *authentic teaching practices* and *instructional practices*. Therefore, I modified these terms to search for *authentic teaching methods* and *instructional methods*.

Conceptual Framework

The model for this evaluation was the K20 Center's Practices for High Achieving Schools (2016). The ten practices for high achieving schools include practices such as shared values, teacher collaboration, and authentic teaching. These practices connect to Mishra and Koehler's (2006) TPACK theory and Guskey's (2000) model for PD evaluation, which were the conceptual frameworks of this study, by focusing on the improvement of instruction through technology, pedagogy, and content knowledge. This evaluation was focused on PD and collaboration, shared values, and authentic teaching practices at the school examined in this study.

TPACK encompasses the understanding that emerges because of the relationship between content, pedagogy, and technology knowledge (Koehler, Mishra, & Cain, 2013). Mishra and Koehler (2006) defined pedagogy as having a deep knowledge of effective teaching methods and how they incorporate educational purposes, aims, and values. Content knowledge is an educator's understanding of the concepts that are to be taught in a discipline (Mishra & Koehler, 2006). TPACK related to the PD provided by the OETT grant to teachers at FVMS by building teachers' knowledge of technology and the use of technology into their instructional practices. Many teachers were potentially strong in one area (technology, pedagogy, or content knowledge), but the ability to blend all three into one cohesive unit was necessary to improve instructional strategies and to enhance student learning.

The framework for this study was also guided by Guskey's (2000) model for PD evaluation. The Joint Committee on Standards for Educational Evaluation (1994) defined evaluation as an investigation of a program's merit or worth carried out in a systematic approach. According to Guskey, good evaluations involve providing meaningful information to those involved so that it can be used to make informed decisions about future PD efforts. In the first level of Guskey's PD evaluation, the participants' reactions to the experience are evaluated. The participants' learning is evaluated in Level 2, which includes measuring the skills, knowledge, and attitudes participants gained through their involvement in the process. In Level 3, the focus shifts from the participant to the organization and the support and change provided by the organization. In Level 4, the

focus shifts back to the participants and their use of the new knowledge and skills. Level 5 is focused on how the experience affected student learning (Guskey, 2002).

There are terms that are important to understanding the TPACK theory. Technological knowledge refers to an educator's knowledge of technologies that can be used in their own teaching and learning (Pringle, Dawson, & Ritzhaupt, 2015). Mishra and Koehler (2006) defined technological knowledge as knowledge about a wide range of tools including standard technology like books and advanced technologies like the Internet. Technological knowledge considers the skill that a person must possess to operate technologies, the knowledge about how to operate the technology, and the ability to use the tools. Additionally, technological knowledge includes a knowledge of the installation and removal of peripheral devices, software programs, and the ability to create and archive documents (Mishra & Koehler).

Other terms important to the TPACK theory are pedagogical knowledge and content knowledge. Pedagogical knowledge refers to the effective use of teaching and learning methods (Pringle et al., 2015). Mishra and Koehler (2006) defined pedagogical knowledge as an understanding of effective teaching methods and how they encompass educational purposes, values, and aims. Content knowledge refers to the level of understanding in relation to a specific subject area (Pringle et al., 2015). According to Mishra and Koehler (2006), content knowledge is an educator's understanding of the concepts that are to be taught in a discipline.

TPACK lies within the intersection of the three types of knowledge and represents a combination of them (Pringle et al., 2015). According to Mirshra and Koehler (2006),

TPACK is considered to be the foundation of effective teaching with technology. TPACK requires an understanding of the following: (a) representation of concepts using technologies; (b) pedagogical methods used to teach technologies; (c) knowledge about concepts of differing degrees of difficulty and how technology can be used to help students address these; (d) knowledge of students' background, prior knowledge, and their personal theories of epistemology; and (e) knowledge of how to use technology to build on existing knowledge (Mishra & Koehler). TPACK guided this study in evaluating whether the technological PD provided by the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. Survey, follow-up interview questions, and observation protocol aligned the purpose of this evaluation with the framework. Each instrument's design was focused on the use of educational technology in instruction regarding three strategies: teacher collaboration, shared values, and authentic teaching practices. Data analysis, in line with the evaluation, identified areas of strengths and areas of weaknesses in regard to collaboration, shared values, and authentic teaching practices as a result of the PD provided by the OETT grant.

Review of the Broader Problem

Defining Educational Technology

Hechter and Vermette (2013) defined educational technology as the technologies that are used to engage students and improve the quality of instruction and learning in science. These technologies include devices such as laptops, sensors, and iPads (Hechter & Vermette, 2013). Similarly, Spector, Johnson, and Young (2014) defined education as

a development of knowledge, skills, and attitudes that enable a person to become an effective problem solver, critical thinker, responsible citizen in society. They defined technology as the application of knowledge to achieve a purpose, which can include devices or the systematic knowledge used to benefit society (Spector et al., 2014).

According to Oluwatumbi (2015), a well-designed 21st century e-learning classroom provides a favorable environment for learning. Although FVMS was not the scene of an e-classroom, educational technology was needed in the learning environment. Technology has made teaching and learning more effective through information and communications technology (ICT; Oluwatumbi, 2015). For example, computer simulations allow teachers and students access to new educational environments, which can improve both instruction and student engagement within the classroom (Oluwatumbi, 2015). The educational environment that FVMS aimed to create was one where teachers' instructional potential was enhanced through instructional strategies incorporating technology with the help of increased teacher collaboration, shared values, and authentic teaching practices.

Along with the use of technology, standards need to be in place to know the technology is serving its purpose in education. Digital literacy standards are critical components for teachers to consider in their application of technologies in their teaching (Voogt et al., 2013). However, it is important that these standards are flexible because of the rapid rate at which technology advances and changes (Voogt et al., 2013). Teachers must be prepared to apply new pedagogical approaches, and it is important that they understand the interactions between ICT and pedagogy (Voogt et al., 2013). The PD

provided to the teachers at FVMS as part of the OETT grant was designed to increase teachers' TPACK through technology tools that were to be implemented in instructional strategies in the classroom.

Teacher Perspectives on Technology Integration

One of the challenges in implementing technologies has been teacher perspectives. Although there is information on technology, many teachers still do not understand how to effectively use technology in their classrooms (Minshew & Anderson, 2015). The PD provided by the OETT grant was aimed at offering training to teachers on how to use the technology provided by the grant.

An example of perspectives teachers have had on technology integration is Hechter and Vermette's (2013) study in which teachers reported that they did not consider the incorporation of technology into science teaching as best practice nor was in the best interest of the teacher to incorporate it. However, Hechter and Vermette noted that participants may have preferred hand-on learning activities, and the results may not indicate a poor attitude toward technology. Through the ongoing monthly PD provided by the OETT grant, teachers' value of technology in the classroom may have increased.

Other factors that may affect teacher perspectives of technology include sex, age, and opinions of the school's administration. For example, Zyad (2016) study found that male and female teachers had different perceptions on collaboration among teachers. Findings indicated that male teachers may collaborate more with same-sex colleagues than female teachers. Additionally, participants agreed that the administration's lack of coordination had a negative effect on their plans to use technology-based activities in

their classrooms (Zyad, 2016). Participants had a generally positive attitude about the idea of ICT integration in education, though results indicated that the younger teachers were more willing to use technology in their instruction (Zyad, 2016).

Looking at how technology was viewed in teaching practices, Gebre, Saroyan, and Aulls (2015) suggested that student engagement can improve understanding of content. Student engagement was optimized when different forms of instruction were used such as student presentations, participation in class discussions, a consideration of student needs and diversities when preparing materials, and a dynamic classroom environment focused on student engagement (Gebre et al., 2015). Through the OETT grant, FVMS tried to engage students in active learning by creating a technology-rich, dynamic classroom environment.

Though technology can improve student engagement and learning, there are external barriers such as lack of technology but also internal barriers like teachers' methods and beliefs. In Minshew and Anderson's (2015) study, teachers cited that while they were interested in using technology in their classrooms, they struggled because of a lack of resources such as computers and access to the Internet. The OETT grant was a means for FVMS to overcome such external barriers. In addition to external barriers, the internal barriers that teachers may face include their own personal knowledge about how to use the technology provided, their perceptions about the technology, and the amount of value they place on the use of technology in teaching (Minshew & Anderson, 2015). If a teacher views technology as an additional tool that they are supposed to use in their classroom instead of as a key to enhancing instruction and contributing to student

engagement and learning, then they will limit their use of the technologies available (Minshew & Anderson, 2015).

Another teacher perspective affecting the use of technology is the comfort in using it. For example, Acikalin (2014), found that while participants expressed interest in using technology in the classroom in the form of tablets and smart boards, they did not feel comfortable using them in their instruction because of a lack of training. Participants also did not feel that they had the time and resources to use them (Acikalin, 2014). To address this issue, TPACK can be a factor in teachers integrating technology in their classrooms and instruction by addressing teachers' level of technological pedagogical content knowledge (Kaleli-Yilmaz, 2015).

Technology Barriers

Despite investments to emphasize the integration of ICT in classrooms, these educational technologies are still not being used by most educators (Mirzajani, Mahmud, Ayub, & Wong, 2016). For instance, although the use of technology in science may improve both teaching and student learning, many teachers are hesitant to use them due to a range of barriers (Hechter & Vermette, 2013). However, technology initiatives are becoming more common in school districts to provide money to purchase instructional technology and offer transformational experiences to students (Daniels, Jacobsen, Varnhagen, & Friesen, 2013). The OETT grant allowed FVMS to purchase newer technologies and provided PD on these technologies.

One of the barriers to using technology is limited access. Daniels et al. (2013) found that firewalls, filters, and Internet throttling (the intentional slowing of Internet

speed) limited teacher access to technology and became a barrier in their implementation of technology in their classrooms. FVMS has limited access to technology because of the number of technology resources available. Hechter and Vermette (2013) also found that a lack of available resources and limited budget became barriers that interfered with teachers using technology in their science classrooms. Additionally, nearly a quarter of the participants reported feeling frustrated by technology (Hechter & Vermette, 2013). Although it is beneficial for schools to have technology available to teachers, if the teachers cannot access it when they need to, then the technology does not serve its purpose (Hechter & Vermette, 2013). The additional technology purchased with the funds from the OETT grant made technology assessable to more teachers at FVMS.

Another barrier to technology implementation is time. Time barriers may include insufficient time for teachers to learn how to use the technology, insufficient time to plan and locate necessary resources, and insufficient time to teach students how to use the technology to improve their own learning (Hechter & Vermette, 2013). Teachers may also find it difficult to have time with their workloads to teach their students how to use the technology and deal with technological and software issues (Kaleli-Yilmaz, 2015). However, it is important for teachers to have the time to collaborate with computer teachers when implementing technology into their classrooms (Kaleli-Yilmaz, 2015). In a similar context, the teachers at FVMS needed to be able to collaborate with those in other disciplines to know whether students have been taught the skills needed to use the new technologies in the classroom.

Another barrier to technology implementation is training. In Hechter and Vermette's (2013) study, participants reported that to integrate technology, they would need PD to improve their knowledge of how to use their technology, their experience with the technology, and how comfortable they felt in applying the technology in their instruction. Participants also expressed that they would benefit from the experience of a mentor teacher to help them (Hechter & Vermette, 2013). The PD provided by the OETT grant to FVMS was focused on the implementation of the instructional strategies incorporating technology through increased teacher collaboration, shared values, and authentic teaching practices. With increased training, self-confidence in using ICT can improve, which also improves attitudes toward the technology and motivation to use it (Mirzajani et al., 2016). Through the PD offered at FVMS, teachers may have developed increased self-confidence at implementing technology in their instruction.

By examining the challenges that teachers face in their integration of technology into their instruction, stakeholders can support these teachers (Hechter & Vermette, 2013). Problems reported by teachers include technology that does not work properly, inadequate IT support, lack of space for existing technology, and a lack of time that is required to use the technology properly (Hechter & Vermette, 2013). In addition to the PD provided by the OETT grant, FVMS also received $40,000 for instructional technology. This new instructional technology allowed FVMS to upgrade the technology at the school. The ongoing PD ensured the technology was installed and ready for use in a timely manner.

Zyad (2016) identified additional technical concerns as resources availability, time constraints and educational software. A lack of time was considered the least important barrier in the integration of technology whereas a lack of technical and pedagogical training was considered the most important barrier. The PD provided by the OETT grant focused on the implementation of the instructional strategies to ensure teachers had access to technical and pedagogical training.

Another barrier with implementing technology in the classroom is the rapid changing nature of technology (Liscouski, 2008). An additional problem is the technology companies add new features to entice buyers to upgrade each year (Pogue, 2015). At FVMS, the English Language Department head said that technology was too old to run the newer programs. Kaleli-Yilmaz (2015) found that technology integration happens effectively in mathematics classrooms when barriers such as hardware problems and a lack of technical support are remedied. The addition of the $40,000 of instructional technology allowed FVMS to purchase up-to-date technologies.

In order to overcome external barriers, schools must be outfitted with the most up-to-date technology and wireless internet connection must be available in all classrooms (Kaleli-Yilmaz, 2015). External barriers include connection problems, software problems, and a lack of PD (Minshew & Anderson, 2015). FVMS addressed these external barriers with the portion of the OETT grant that provided $40,000 in technology to the school. This study does not address that portion of the grant, but it is an important factor to include when evaluating the success of the PD portion of the grant. In a study of Moroccan classrooms, Zyad (2016) found that an insufficient amount of ICT equipment

and poor quality equipment were critical barriers to making technology a part of the ordinary scene in these classrooms. Maich and Hall (2016) suggest funding needs to be secured for hardware, software, and technology support before implementing iPads on a class-wide basis. The OETT grant funding allowed FVMS to make technology an ordinary scene at FVMS.

Barriers preventing teachers from integrating technology into instructional practice are their level of comfort with technology and teachers' perception of how they use technology in their classroom along with how their colleagues use technology (Minshew & Anderson, 2015). FVMS teachers are allowed time to collaborate and share their perceptions on technology use in their classroom and the classrooms of their colleagues. Kafyulilo, Fisser, and Voogt (2015) found that teachers encountered technological and pedagogical challenges when working with technology. It is important that teachers receive support from a facilitator or expert to overcome these challenges (Kafyulilo et al., 2015). The K20 Center facilitators provided expert instruction and recommendations to implement instructional strategies incorporating technology.

Shared Values of Teachers

Nikolova and Andersen's (2017) study focused on Service-learning. Service-learning has acquired strong interest among teachers as a model of experimental education through community engagement (Nikolova & Andersen, 2017). According to Nikolova and Andersen (2017), research has targeted elements of this teaching model that contribute to student-related benefits, but there has been diminished emphasis on what aspects facilitate the creation of shared values to other stakeholders. Nikolova and

Andersen (2017) sought to shed light on the elements of course design founded on service-learning pedagogy that is devoted to the creation of shared value for multiple stakeholders. Andrews and Abawi (2017) found that within a school there is a feeling of energy and responsibility to shared school goals linked to the supporting of students and enabling them to reach their full potential regardless of their diverse learning strengths and challenges. Through the PD provided by the OETT grant, teachers at FVMS were given the opportunity to collaborate and create shared goals and values for students and the school.

The building of shared values is an essential prerequisite in the promotion of collaboration and problem solving (Lee & Li, 2015). Service-learning has acquired strong interest among teachers as a model of experimental education through community engagement (Nikolova & Andersen, 2017). Although research has targeted elements of this teaching model that contribute to student-related benefits, there has been less emphasis on what aspects facilitate the creation of shared values to other stakeholders. Nikolova and Andersen (2017) sought to shed light on the elements of course design founded on service-learning pedagogy devoted to the creation of shared value for multiple stakeholders. Andrews and Abawi (2017) found that within a school there is a feeling of energy and responsibility to shared school goals linked to the supporting of students and enabling them to reach their full potential regardless of their diverse learning strengths and challenges. The PD provided by the OETT grant gave teachers at FVMS the opportunity to collaborate and create shared goals and values for students and the school.

School principals should establish and maintain common core values within their schools (Van Nierkerk & Botha, 2017). Principals need to select the values based on the needs of the school and what key stakeholders have determined is important (Van Niekerk & Botha). Lee and Li (2015) found that the principal's attitudes, actions, and behaviors had a critical effect on teacher attitude and school culture. A principal who does not establish common core values or does not adhere to the established values often becomes an ineffective leader (Van Niekerk & Botha, 2017). At FVMS, the principal successfully completed Phase I of the OETT grant in the school year prior to FVMS applying for the OETT grant. Principals must find meaningful ways to implement shared values within the school (Van Niekerk & Botha, 2017). To encourage faculty and staff to support the established shared values of the school, the building principal must communicate the purpose of the shared values and must participate in mutual dialogue about the shared values as well as the school's vision (Van Niekerk & Botha, 2017). It is critical that the principal emphasizes the importance that all school activities and events be based on the shared values of the school (Van Niekerk & Botha, 2017). All stakeholders need to be committed to the creation of shared values (Nikolova & Andersen, 2017). The principal at FVMS regularly communicates with staff members and uses weekly faculty meetings as an opportunity for staff to align their personal values with the school's vision. FVMS also participates in a monthly district-wide early release day to allow staff to participate in PD. This PD time allows for communication and reflection of values and the school's mission.

Teacher Collaboration

Collaboration between teachers is a vital predictor for successful implementation of digital media in schools and teaching (Drossel et al., 2017). Through collaboration, educators benefit from the knowledge, experience, and expertise of colleagues and gain insights that would not have been possible without collaboration (Hobbs & Coiro, 2016). Andrews and Abawi (2017) argued that the opportunity for educators to work collaboratively is key to meeting the diverse learning needs of students. A collaborative environment allows teachers to share strengths and grow in areas of weakness (Andrews & Abawi, 2017). Collaborative opportunities are critical to teachers with interests in digital literacy (Hobbs & Coiro, 2016). Loeb (2016) identified three areas of cooperation: collaboration between faculty, interactions between faculty and students, and a partnership between the faculty and key stakeholders in the district. Collaboration among faculty members may happen in various forms and serves different purposes (Loeb, 2016). Monthly PD training sessions allow FVMS faculty the opportunity to work and learn collaboratively.

School principals should embrace collaborative individualism and enhance the capacity of teacher leaders (Andrews & Abawi, 2017). Working as collaborative individuals, teachers ensure the school works in harmony for the good of the whole and provides multiple opportunities for student success (Andrews & Abawi, 2017). Lee and Li (2015) found many novice, first-year teachers appreciated the opportunity to work with experienced teachers, while experienced teachers enjoyed the opportunity to share their experiences with novice teachers (Lee & Li, 2015). The PD provided by the OETT

grant gave novice and experienced teachers at FVMS the opportunity to collaborate with each other monthly.

In Hobb and Corio's (2016) study to investigate why collaborative experience with technologies is a critical component in the support of educators, participants collaborated with colleagues to create a project-based inquiry unit to utilize digital skills in an authentic learning environment. Hobb and Corio (2016) found collaboration is understudied in education as an instructional strategy for PD. This study could provide insight to collaboration as an instructional strategy for PD.

Integrating Technology into Teaching Practices

The integration of technology into classroom instruction is gaining attention among educators, administrators, and policymakers (Kafyulilo et al., 2015). Technology varies from actual devices to programs, applications, and websites (Minshew & Anderson, 2015). It is critical to explore the barriers surrounding technology integration to fully understand how effective technology is in promoting student success, (Daniels et al., 2013). Students in K-12 classrooms today view and use technology in a different way that past generations (Hechter & Vermette, 2013). Teachers must be prepared to use different technologies for different lessons through understanding and applying the principles of TPACK (Hechter & Vermette, 2013). The OETT grant-funded PD showed FVMS teachers how to integrate technology into their instructional practices.

Kaleli-Yilmaz (2015) found that educators rarely had sufficient knowledge of technology and how to effectively integrate it into their mathematics instruction. At FVMS, this was true in most classrooms. Kaleli-Yilmaz (2015) found that participant

attitudes toward technology played a significant role in their willingness to integrate technology into their instruction. Teachers stated they would not have had enough knowledge of ttechnology integration prior to their computer-assisted mathematics course (Kaleli-Yilmaz, 2015). A similar need at FVMS was addressed by the PD, which focused on the implementation of the instructional strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. Authentic assessments can be associated with authentic teaching. In higher education, authentic assessments are professional portfolios, case studies, debates, student created videos, essays, practica, internships, student teaching experiences, and scientific lab assignments (Eddy & Lawrence, 2013, p. 256). Authentic assessments provide student-centered knowledge construction, which can be individualized based on student needs, interests, and goals (Eddy & Lawrence, 2013). FVMS, though not a higher education institute, has given students the opportunities to partake in authentic assessments, such as students using the technology for video production.

Teachers are a critical component to technology integration in K-12 classrooms (Minshew & Anderson, 2015). Teachers use their own discretion when integrating technology into their instruction, and the level of technology integration varies from teacher to teacher (Minshew & Anderson, 2015). An educator's sense of self-efficacy, a belief that they have the ability to impact student learning and performance, is directly related to the practices they use in the classroom (Main, Pendergast, & Virtue, 2015). In Minshew and Anderson's (2015) study, a teacher's self-efficacy in terms of technological knowledge as well as technological pedagogy resulted in poor integration of iPads in

their classrooms. The PD provided to teachers at FVMS could improve teachers' technological and pedagogical knowledge within their instructional practices.

Computer-based technology has changed the personal and professional lives of much of the world's population (Bebell & Pedulla, 2015). The integration of technologies into traditional classrooms has affected a large number of students (Bebell & Pedulla, 2015). Prior to FVMS receiving the OETT grant, technology devices, including computers and iPads, were limited in number and confined to two computer labs. The addition of mobile devices has allowed technologies previously confined to computer labs to be moved into traditional classrooms (Bebell & Pedulla, 2015). Through the OETT grant, FVMS purchased technologies to move the technology out of the two computer lab settings and into traditional classrooms. The PD provided at FVMS taught teachers to successfully implement this technology into their classrooms.

TPACK provides a framework which organizes teaching with technology and allows teachers the ability to integrate content, pedagogy, and technology (Minshew & Anderson, 2015). TPACK is enhanced when educators are able to effectively combine content, pedagogy, and technology as a tool that supports student learning (Minshew & Anderson, 2015). Acikalin's (2014) findings revealed the most used technological tool in classrooms were PowerPoint presentations. 63% of participants reported using PowerPoint presentations in their classroom instruction (Acikalin, 2014). Only 30% of participants used videos in their classrooms and fewer than 10% used any type of animation in their instruction (Acikalin, 2014). Kaleli-Yilmaz (2015) conducted a study to determine the factors present in effective technology integration. Kaleli-Yilmaz found

that teachers effectively integrating technology were trained with TPACK. The study informed educators about technology integration in mathematics, promoted technology integration in classrooms, and attempted to determine which factors were effective in the integration of technology (Kaleli-Yilmaz, 2015). The OETT grant provided FVMS with training to inform teachers about technology integration and promote technology integration practice in their classrooms. The study was used to determine which factors were effective in technology integration.

Teaching Practices Related to Technology

Computer technology was introduced in the 1980s. It was widely thought of as an innovation that would be brought into traditional classrooms and that access to ICT would positively change education (Mirzajani et al., 2016). Technology initiatives at the federal, state, and local levels have encouraged and established the adoption of technology in traditional classrooms (Bakir, 2015). Large amounts of time, money, and energy have been spent to develop frameworks and policies to promote and encourage technology use in teacher training and traditional K-12 classrooms (Bakir, 2016). An examination of technology plans nationally demonstrates how themes have evolved in technology integration (Bakir, 2016). The first national technology plan focused on improving technological literacy, while later technology emphasized the integration of technology classrooms in addition to the initial technological literacy focus (Bakir, 2016). Recent technology initiatives emphasize teacher education and the use of technology to both engage and motivate teachers in their classroom instruction (Bakir, 2016). The latest initiative shifts the focus to connected teaching (Bakir, 2016). Educational technology is

more in-depth than providing laptops to every student in a classroom or using technology to differentiate instruction for students (Brown, 2014). Educational technology leadership centers around teachers, administrators, and technology leaders who are driven to enhance instructional quality and student learning through the use of technology in the classroom (Brown, 2014). The National Council of Teachers of Mathematics stresses that technology usage during mathematics instruction is necessary and teachers must effectively adapt the technology usage to fit the teaching and learning process (see Kaleli-Yilmaz, 2015). Through the PD provided by the OETT grant, FVMS integrated tools such as Web 2.0 and Google tools. The OETT grant allowed FVMS to create a classroom environment dynamic between technology use and pedagogy.

iPads were more recently introduced to the classroom setting. Traditional desktops or laptops have limited access for students in the classroom, whereas classroom sets of iPads allow simultaneous access to the Internet throughout the classroom (Maich & Hall, 2016). A classroom set of iPads eliminates the need to relocate a class to the computer lab and offers teachers more flexibility to utilize teachable moments (Maich & Hall, 2016). FVMS purchased tablets through funds from the OETT grant. The tablets allow teachers and students to access the Internet directly from the classroom and eliminated the need to take the class to the computer lab. The PD provided allowed FVMS to curb the desire to download as many apps as possible, while still basking in the excitement of new technologies for the school.

Professional Development

It is critical that educational leaders are involved in professional learning opportunities, networks, and communities (Brown, 2014). Professional learning networks enable the participant to access resources and experts from which they can improve upon their own professional practice (Brown, 2014). K20 Center PD allowed teachers and administrators of FVMS to form a professional learning community with the K20 Center and its PD facilitators. The access to support in the form of PD opportunities may be a significant component in an educator's successful implementation of technology in their classrooms (Minshew & Anderson, 2015). PD opportunities should be planned with the interest of the educators in mind and should be based on their current technology needs (Minshew & Anderson, 2015). The OETT grant-funded PD allowed FVMS teachers to receive PD implementation of instructional strategies effectively and incorporate technology with three of the 10 selected practices of high achieving schools. The PD also allowed teachers to coproduce and distribute their ideas and experiences implementing the instructional strategies in their classrooms.

A school within Minshew & Anderson's (2015) study participated in weekly technology PD made up of multiple grade and content areas. Teachers were assigned a skill for the upcoming week and asked to implement the skill in their classroom instruction before the next meeting (Minshew & Anderson, 2015). The OETT grant-funded PD was comprised of teachers from all subject areas and all grade levels at FVMS. Minshew and Anderson (2015) indicated a need for further examination into the influence of PD in teachers' integration and utilization of iPads in their classrooms. The

study attempts to examine the effectiveness of the PD and whether training was successful for implementing the instructional strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices.

Effects of Professional Development on Teachers

Educators usually participate in ongoing PD opportunities because they desire to stay current in their content and updated on the best pedagogical practices (Main et al, 2015). A relatively new focus on middle school education has provided new insights and an additional understanding of adolescent development, learning needs, and effective pedagogies to meet their needs (Main et al., 2015). The increased knowledge has highlighted a need for middle school educators to review their pedagogical practices to be certain they are addressing the needs of their students (Main et al., 2015). Current PD opportunities fail to educate teachers on why the technology is important to the educational process and ways in which the technology can improve student learning and engagement (Brown, 2014). The OETT grant-funded PD allowed FVMS to use Web 2.0 apps and Google tools. FVMS could consider using Wikis at a later date. Wikis are used as a collaboration forum and an avenue for educators to collaborate and gain an large amount of information about a number of topics in a virtual format (Brown, 2014). Wikis would also allow for additional teacher collaboration at FVMS. One of the benefits of Wikis as a learning tool is that they are malleable and provide a large range of approaches that educators can use in a variety of settings (Eddy & Lawrence, 2013). Google Plus would allow teachers at FVMS to develop a professional learning network. Google Plus allows educators to form collaborative groups specific to certain grade levels and/or

subject areas (Brown, 2014). The use of Wikis and Google Plus would further the efforts of FVMS to increase teacher collaboration, shared values, and authentic teaching.

Teacher preparation programs must prepare pre-service educators to effectively integrate technology into classroom instruction (Bakir, 2016). These programs have the potential to heighten classroom teaching and learning by training teachers to use technologies in their classrooms (Bakir, 2016). The TPACK framework provides a basis for effectively implementing technology in teachers' classroom instruction (Bakir, 2016). This study uses the TPACK framework to explore whether the OETT grant-funded PD was effective in the implementation of instructional strategies incorporating technology through increased teacher collaboration, shared values, and authentic teaching practices.

Many countries are spending large amounts of money to bring computers and telecommunication networks into traditional classrooms (Mirzajani et al., 2016). However, such contributions are not beneficial unless educators are prepared to be technology-proficient teachers who positively use new e-learning technologies to establish successful teaching and learning (Mirzajani et al., 2016). Mirzajani et al. (2016) found participants recommended that the enhancements of PD in teaching new e-learning skills related to teaching must be understood, and all acknowledged that educators had to increase their technical knowledge and skills. A potential outcome of this study is that teachers at FVMS will have seen an improvement in their technical knowledge and skills when incorporating technology into their instructional strategies.

In the classroom, students are comfortable with technology for enjoyment but not as an effective tool for learning (Maich & Hall, 2016). "As tablet-based technology

grows in acceptance and accessibility as a tool for educational use, educators have increasing opportunities to learn from the experiences of other educators, administrators, and consultants who have experienced the process of implementing and utilizing iPads for class-wide purposes" (Maich & Hall, 2016, p. 150). Teachers have an array of knowledge and skills they bring with them into the classroom, and they require continuing PD opportunities to build upon and enhance those skills and knowledge (Main et al., 2015). In middle school classrooms, the classroom teacher should serve in the role of a facilitator. Teachers require pedagogical knowledge that is built upon the needs of adolescent students and allows teachers them to serve in the facilitator role (Main et al., 2015).

Evaluating Professional Development

While there is a minimum number of hours of continuing PD required for teachers to maintain registration, there is a lack of knowledge about what continuing PD is and how its effectiveness can be measured (Main et al., 2015). This study was a program evaluation to determine the effectiveness of the PD in the implementation of instructional strategies incorporating technology through increased teacher collaboration, shared values, and authentic teaching practices.

According to Ofsted (2006), most districts are unaware of the effectiveness of their PD (as cited in King, 2014). King (2014) used a case study design to investigate the influence of PD on teachers' learning in five urban and disadvantaged schools. FVMS is similar in that it serves disadvantaged students, albeit in a rural setting. Williams-McMillan and Hauser (2014) investigated faculty perspectives related to the effect of a

system-wide PD series on faculty pedagogical practices. The Professional Development Evaluation Model developed by Guskey was used to organize and interpret the data (Williams-McMillan & Hauser, 2014). The data collected using the five-stage Professional Development Evaluation Model enabled program administrators to determine if participants had a positive training experience; if the program had sufficient and appropriate content, structure, and sequential arrangement; and if there were content areas that needed enhancement (Williams-McMillan &Hauser, 2014). At FVMS, there was a need to evaluate the effectiveness of the OETT grant-funded PD. I collected data using a Likert-type survey, interviews, and classroom observations to determine if the participants had a positive training experience and to determine the effectiveness of the PD in the implementation of instructional strategies incorporating technology through increased teacher collaboration, shared values, and authentic teaching practices.

Implications

A significant implication of this research includes the contribution of new material on the effectiveness of PD when implementing instructional strategies incorporating technology. This study was conducted to examine whether PD provided by the OETT grant influenced teachers' use of technology in their instruction as well as their shared values and collaboration. The results of this study will potentially help administrators address the effectiveness of PD in the implementation of instructional strategies incorporating technology. The conceptual framework for this project study was Mishra and Koehler's (2006) TPACK Theory and Guskey's (2000) model for PD evaluation. The implication of this study relates to Mishra and Koehler's (2006) TPACK

theory by focusing on effectiveness when implementing instructional strategies incorporating technology and relates to Guskey's (2002) model for PD evaluation by contributing new material on the evaluation of the effectiveness of PD when implementing instructional strategies incorporating technology.

Anticipated findings from survey, interview, and observation data included identification of patterns, trends, and themes related to the effectiveness of PD in the implementation of instructional strategies incorporating technology. An additional implication may possibly include perceptions that may be contradictory in regards to the effectiveness of the PD in the implementation of instructional strategies incorporating technology. Possible project directions based on anticipated findings include an Evaluation Report of the effectiveness of the PD in teachers' implementation of instructional strategies incorporating technology through increased teacher collaboration, shared values, and authentic teaching practices. Specifically, a report of ways technology is being implemented into instructional strategies at FVMS has been included in the Evaluation Report.

Summary

This section outlined the key points associated with this proposed study, including background information and identification of the local problem, a rationale and significance of the need for the study, a review of the relevant literature, and implications of the proposed study. The local problem was that it is unknown whether training was successful for the implementation of the instructional strategies specified in the OETT grant proposal:teacher collaboration, shared values, and authentic teaching practices. It

was also unknown the influence PD had on teachers' implementation of effective instructional strategies while incorporating technology with three of the 10 selected practices of high achieving schools. The gap in practice was that teachers may not be implementing instructional strategies incorporating technology successfully in their classrooms.

In this section, I also discussed the purpose of examining whether the technological PD provided by the OETT grant achieved FVMS's funding goal: examine teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. I used this information to report the findings of the program evaluation for the school. Current literature has shown the importance of evaluating PD (Guskey, 2002; Bakir, 2016; Williams-McMillan & Hauser, 2014; King, 2014).

The following section focuses on methodology. Section 2 provides additional information on the mixed methods design and approach, participants, data collection, analysis, and limitations. I will discuss data collection methods and data analysis procedures, as well as a rationale for sample size and data collection methods.

Section 2: The Methodology

Introduction

The purpose of this outcome-based evaluation research study was to examine whether the technological PD provided by the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. A program evaluation using a mixed methods research design was used for this study, which was appropriate to determine whether the PD implemented through OETT grant money influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. According to the Corporation for National and Community Service (n.d.), an outcome-based evaluation is used to measure whether the program met its identified goals. This outcome-based evaluation was summative and addressed each of Guskey's (2000) five levels of PD evaluation: (a) participants' responses to the experience, (b) participants' learning, (c) support and change provided by the organization, (d) participants' use of the new knowledge and skills, and (e) how the experience affected student learning (Guskey, 2002). The use of a Likert-style survey and interviews addressed the first four levels of Guskey's evaluation of PD. The fifth level was addressed using classroom observations.

Mixed Methods Design and Approach

The program evaluation for this study involved a mixed methods research design. This type of evaluation was appropriate because I was trying to determine whether the new technologies and PD efforts implemented via OETT grant money influenced

teachers' shared values, collaboration, and instructional practices regarding instructional technology. A mixed methods approach allowed for qualitative and quantitative data collection. A quantitative approach yielded data from a Likert-style survey. However, a qualitative component was needed for additional insight and clarification to supplement the data gained from the survey.

In seeking to determine the best approach for this study, five different approaches were considered: case study, phenomenology, grounded theory, narrative, and program evaluation. A case study is used for in-depth knowledge of a bounded system and is focused on describing the activities of the group (Creswell, 2007), which did not fit the purpose of this study. Phenomenological research involves spending time with the participants then making interpretations based on observations and interactions before in-depth data collection (Lodico et al. 2010). Because this method requires a larger investigation of participants, it did not fit this study, which did not require an extensive investigation. Grounded theory requires comparing data collected from different interviews, field notes, or documents to derive a theory about the situation after analysis of data collection (Hancock & Algozzine, 2011; Merriam, 2009), which was not necessary to answer the study's research questions. The narrative approach is used to focus on participants' personal stories, photographs, interviews, journals, letters, autobiographies, and other materials to analyze for meaning (Glesne, 2011; Merriam, 2009), which did not fit the purpose of this study. Criteria for the chosen approach, program evaluation, connected to the problem and purpose of this study.

A program evaluation was determined to be the best approach for this outcome-based evaluation study to investigate how PD influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. Evaluations can be used to explain the events, activities, actions, and interactions involved in an established educational program that are occurring over time (Creswell, 2012). Evaluations can also target four aspects of work: team efficiency, team effectiveness, individual members' contributions, and effect on practice and student learning (Killion & Roy, 2009). The program evaluation in this study was focused on team effectiveness and the effect on practice and student learning. Groups that periodically evaluate and analyze the outcomes of assessments in each of these areas can acquire data to strengthen their work (Killion & Roy, 2009). The assessment and analysis provided by the program evaluation of this study can benefit efforts by FVMS to strengthen the use of instructional strategies incorporating technology.

Strategies for collecting data included an individual Likert-type survey, interviews, and classroom observations. A survey was also used to gain insight and input in the evaluation of how the technological PD provided by the OETT grant influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. The survey was based on an existing survey and was revised as needed to ensure validity of the items used. The survey was made available to all teachers in the target school; 18 surveys were completed and returned. A Likert-scale survey was used to gain insight into teachers' self-reported levels of TPACK and technology use in instructional practices to evaluate how the technological PD provided by the OETT grant

increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices.

The outcomes and performance measures evaluated included how the technological PD provided by the OETT grant influenced teachers' shared values, and collaboration, and instructional practices regarding instructional technology. Research has shown similar uses of program evaluation. For example, Williams-McMillan and Hauser (2014) used a program evaluation to investigate faculty perspectives related to a PD series designed to improve pedagogical practices in a community college setting. In another program evaluation, Nugent et al. (2013) used a goals-based program evaluation to discover whether a level of competence was achieved in training surgeons. A goals-based program evaluation was considered for this study, but my intent was to measure the desired outcome rather than whether goals were met. The overall evaluation goal of this study was to evaluate how the technological PD provided by the OETT grant influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology.

Setting and Sample

Participants selected for this study by purposeful sampling included teachers and administrators at a small rural school district in Oklahoma. Inclusion criteria included (a) participants had to be 18 years or older and (b) participants had to be a certified teacher at FVMS. Twenty-five teachers of sixth to eighth grade students at the school were invited to participate in this study. A medium effect size with a .05 alpha was chosen based on the recommendations of Cohen (1992) and GPower (2010). A medium effect size was

important to explain the relationship between the participants within the study without making any generalizations regarding the true relationship to the broad population. All teachers were given the opportunity to complete the self-assessed survey. Six interviews were conducted for the qualitative portion of this evaluation.

Purposeful sampling was used to select participants from various subject areas, as it is a method to intentionally pick participants to learn about the topic under study (see Creswell, 2012). This type of sampling allowed for the inclusion of a variety of participants, but it did not dictate how many or in what proportion the types appear in the population (Bogdan & Biklen, 2007). Two teachers from each grade level were selected for interviews. The six teachers selected for interview were also asked to be available for a 45-minute classroom observation.

Methods for establishing a researcher–participant working relationship included meeting with the school principal to present an overview of the study as well as attending a faculty meeting with all potential participants to present an overview of the study. Time was given for asking questions and addressing concerns. Each participant was provided the informed consent form. Permission to conduct research at the site was obtained from the building principal and submitted with the Walden University Institutional Review Board (IRB) application prior to data collection for this study (approval no. 03-28-18-0030501). Written consent was obtained by all participants prior to the study. The informed consent document explained the purpose of the study and the voluntary nature of the study. Participants were notified that they could opt out of the study at any time. All participants were assured of the voluntary nature of the study and were assured that

their responses would be kept confidential. All identifying information was kept separate from data. Data were kept password protected and secure, and only I have access to participants' information as it relates to the data.

Data Collection Strategies

The strategy for data collection was sequential. Six interviews and six classroom observations were conducted to provide results to Research Question 1 and Research Question 2. Two teachers from each grade level (for a total of six teachers interviewed) were selected. Purposeful sampling was used to select participants to get participants from various subject areas. To ensure accuracy when transcribing the interview, an audio recording device was used. A data recording protocol was used to record the data. The interviews were used to discuss the results of the survey and provided additional insight and clarification to enhance the data obtained from the survey. The six teachers selected for interview were asked to be available for a 45-minute classroom observation. The classroom observations were used to observe the teachers' use of the new tools which were presented in the PD training.

There were a total of 21 teachers at the study site; 18 teachers completed the survey. Of the 18 teachers that completed the survey, six teachers were selected for the one-on-one interviews and classroom observations. The surveys were distributed first. Approximately 2 weeks later, the interviews and observations were scheduled for approximately 2 weeks after the surveys had been returned to the researcher. The interviews occurred on two school days. After the interviews were complete, the observations occurred on 2 additional school days. The forms of data collection included

a Likert-style survey, interviews, and classroom observations. Including qualitative research with the quantitative allowed for an increased understanding of how the tools learned in PD training are used in the classroom. The integration of the qualitative and quantitative approaches occurred when the data from the surveys, interviews, and observations were collected and analyzed. Quantitative data also includes demographic information for the teachers at FVMS (see Table 1)

Table 1

Demographic Information for Teachers at Freedom View Middle School

Teacher	Gender	Age
T1	Female	40-49
T2	Male	50+
T3	Female	50+
T4	Male	20-29
T5	Female	40-49
T6	Male	40-49
T7	Female	50+
T8	Male	50+
T9	Male	30-39
T10	Female	50+
T11	Male	30-39
T12	Female	40-49
T13	Female	50+
T14	Male	20-29
T15	Male	50+
T16	Male	30-39
T17	Female	50+
T18	Female	50+

Qualitative Sequence

Interviews. Six interviews, approximately 60 minutes in length, were conducted to provide results to Research Question 2. Purposeful sampling was used to ensure two teachers from each grade level were selected for interview. Purposeful sampling allowed

me to select a sample of participants to promote the development of the emergent theory (Bogdan & Biklen, 2007). Interviews allowed for additional, in-depth insight from the participants through general, open-ended questions (see Creswell, 2012), which involved for this study involved a self-administered survey and face-to-face interviews to enhance survey data. A member check was used to ensure the accuracy of the information gained (see Creswell, 2012). By using a program evaluation, the most accurate information was obtained to evaluate how the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. A copy of the interview questions is available in Appendix C of this study.

Classroom observations. Six classroom observations were conducted to provide results to Research Question 1. The six teachers, two from each grade level, selected for the interview were asked to be available for a 45-minute classroom observation. The classroom observations were used to observe the teachers' use of the new tools which were presented in the PD training. The observations were necessary to allow me to see how the teachers were using the new tools in their classrooms. The teachers' use of the tools and their comfort level using such tools helped me determine the effectiveness of the PD and whether training was successful for the implementation of the instructional strategies of teacher collaboration, shared values, and authentic teaching practices. I used an observation walkthrough field notes template that I created (see Appendix D). This template is connected to Mishra and Koehler's (2006) TPACK theory, which was the conceptual framework of this study because it had places to note types of technology and

how those technologies were being used in instruction; there was also an area to note the pedagogy being used. This template was reviewed by two separate administrators for reliability and validity. The administrators compared the template to the current teacher evaluation walkthrough model in use at their respective schools to ensure it was credible, reliable, and trustworthy.

System for tracking data. The system for tracking data and emerging understandings were accomplished through a research log. The research log contained data collection methods and an analysis of the data as it related to the research questions. The research log was used to organize data collection tools and data. The data collection tools were kept in the research log as well as ideas and themes that emerged from the data. Four general themes were broken down into more specific themes in the research log.

Gaining access to participants. Before collecting any data, I requested a written letter from the principal of FVMS stating the school's agreement of participation in the research study. The request included access to participants and information on the protocol for administering the Likert-style survey (see Appendix B). After I received IRB approval, I secured a meeting with the principal of the school to review the protocol for administering the Likert-style survey. After this meeting, I attended the monthly faculty meeting to present the plan and the goals of the study to the entire faculty. All participants received an informed consent form at this meeting. After a consent form was given to each teacher, and a signature obtained, each teacher individually received the survey. A date was set and announced as a deadline for the survey to be completed and

returned to the researcher. Participants were instructed to return the surveys to me in person on a subsequent visit to the school. Interviews and classroom observations were scheduled on a date convenient to the participants.

Sequential strategies and data triangulation. Triangulation ensures a study is accurate and credible through multiple data sources (Creswell, 2012). Triangulation was achieved using a member check and a program evaluation, which included a survey, interviews, and observations. Triangulation was important because multiple sources of data lead to a greater understanding of the phenomenon that is being studied (Bogdan & Biklen, 2007). The Likert-style survey was administered first. After the surveys were received and coded by the researcher, a date for interviews and classroom observations was scheduled.

Role of the researcher. Currently, I have no professional roles at the school site for this study. I was a teacher in this school district from 2001-2012; I taught in this school from 2004-2012. The current principal was principal during my last year at the school. I did not currently have any professional relationships with any of the participants except for being a teacher and having a common interest in education. Many of the teachers who were at the school when I was a teacher there were no longer teaching at this school; therefore, any past relationships were not likely to affect data collection or to create biases to the topic. I have limited interaction with the teachers because I no longer live in the community or teach at the school. Roles and relationships may have affected data collection but on a limited basis. Participants could opt out of the study at any time. Participant responses remained confidential and privacy was protected.

Biases that have potentially affected data collection include poorly written or skewed interview questions and reflexivity (Yin, 2014). An additional potential bias may be researcher-related, as I am familiar with technology used in instructional practices and have remained aware of personal bias. Member checks and peer debriefing helped eliminate this potential bias. One limitation is that participants may elect not to respond honestly during data collection procedures. To decrease the potential of reflexive or biased responses, I reiterated that participant responses would remain confidential and their privacy would be protected.

Personal experiences or biases related to the topic relate to my current work with evaluation of the PD. Maintaining a bias-free view was vital to determine the effectiveness of the PD without consideration of my personal experience receiving PD for instructional technology. Interview transcripts were examined by participants and a colleague not connected to the study to decrease the potential for bias. Participants determined the level of potential bias by checking the interview transcripts for accuracy. My colleague, a practicing researcher in the field of education, specifically curriculum, instruction, and assessment, determined the level of potential bias by ensuring the information given was credible, reliable, and trustworthy. I also recorded details of classroom observations using a field note template and a recording device to record interviews to decrease the potential for bias as suggested by Bogdan and Biklen (2007). As recommended by Yin (2014), I used reflective practices, such as journaling for self-reflection and the use of peer debriefing, when analyzing the data to ensure objectivity and reporting data free of my opinion or bias.

Quantitative sequence. I used the TPACK survey to collect data for the quantitative component of the research. A survey was the most appropriate method to evaluate the effect of the technological PD provided by the OETT grant and the increase of teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. A survey can be used to describe trends and to identify important beliefs and attitudes about a situation (Creswell, 2012). The Likert-type survey was used to determine how the PD influenced teachers' shared values regarding instructional technology and their collaboration and instructional practices using instructional technology. Responses were rated on a scale based on the participant's agreement with each statement, ranging from Strongly Disagree to Strongly Agree. I used the data to measure how the participants' authentic teaching practices changed because of the technology PD as identified by the TPACK survey.

I gave the survey to all teachers at FVMS after a faculty meeting at the school. I personally ensured that all teachers received based on a list containing the names of all teachers in the school provided by the principal. Participants personally returned the surveys to me. Participation in the study was completely voluntary, and participants could elect to not participate at any time. Eighteen surveys were completed and returned. The TPACK survey (Schmidt et al., 2009) was used and revised as needed to ensure validity of the items used. A copy of the survey is available in Appendix B of this study. I will provide raw data by request.

I used the Likert-type survey to determine how the PD influenced teachers' shared values regarding instructional technology and their collaboration and instructional practices using instructional technology. I used the interviews to determine the relationship between teacher collaboration, shared values, and the use of instructional strategies incorporating technology in the classroom. I used the observation tool to determine the use of instructional strategies incorporating technology through increased authentic teaching in the classroom. Through each of these tools, I gained insight to use in the evaluation of the effectiveness of the PD in providing technology PD to enhance teacher collaboration, shared values, and authentic teaching.

Data Analysis

Procedures for Data Analysis

I analyzed data gained from the surveys using the SPSS computer program and descriptive statistics. After receiving the completed surveys, I sorted the responses using a chi-square, consisting of a two-by-two table, to organize the data. Survey responses were categorized and sorted as increase in technology use or no increase in technology use. Educators were categorized into two groups: novice teachers and veteran teachers. Novice teachers were defined as teachers with fewer than five years of teaching experience. Veteran teachers were defined as teachers with five or more years of teaching experience. I used a chi-square to determine the proportions of veteran teachers and novice teachers in their views of the effectiveness of the PD in providing technology PD to enhance teacher collaboration, shared values, and authentic teaching. I used the chi-square to determine the effectiveness of the PD based on the responses to the Likert-type

survey. I chose these categories to determine if experience and use of technology impact the perceived effectiveness of PD. By dividing into these categories, future PD could be modified based upon the results of this study should a pattern become evident between participants in respective categories. I analyzed the data gained from the interviews and classroom observations to identify emerging themes that led to evaluating whether the technological PD provided by the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. One of the goals of the coding process was to search for recurring categories. Seven themes emerged from the data.

Procedures to Ensure Accuracy

Procedures to ensure accuracy and avoid personal bias included data collection and analysis processes that were objective and free of personal feelings. I achieved this by having no pre-conceived biases or notions of FVMS, due to having no personal involvement with this school district.

Procedures for Validity and Discrepant Cases

I used triangulation, such as the follow-up interview to the survey and a member check, to show validity of the findings. Procedures for dealing with discrepant cases included using probing questions in the interview to acquire a deeper understanding of the discrepancy.

Presenting the Findings

I used descriptive statistics to present the quantitative data describing the impact of the technological PD provided by the OETT grant on teachers' abilities to implement

instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. The qualitative portion of the research findings, from the interviews conducted, were presented using tables and graphs to highlight emerging themes. I used a graph to illustrate the initial themes that emerged and a table to show the expansion of each theme.

Limitations

The data collected for this study represented the participants' own views of technology use in their classroom contemporaneous with the study (Minshew and Anderson, 2015). Gebre et al. (2015) also found the use of self-reported data, to which no evidence existed to show professors practiced what they reported, was a limitation of their study. Similar potential limitations identified in this study included the truthfulness of participants on the questionnaire and in the interviews, as well as the small sample size. As a result of a small sample size, a lack of diversity among the participants was an additional potential limitation of this study.

Limitations associated with qualitative research include areas such as researcher training and experience. The quality of qualitative research relies on the skills, expertise, and experience of the researcher. Qualitative research may be influenced more easily by researcher bias than quantitative research (Creswell, 2014). Participant responses can control the data in terms of recollection, honesty, or the desire to produce a response that will be pleasing to the researcher. Qualitative research may become expensive and time consuming for the researcher, which may also become a limitation (Creswell, 2014).

Data Analysis Results

It was unknown whether PD training at FVMS was successful for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. In addition, it was unknown what influence PD had on teachers' implementation of instructional strategies while incorporating technology with three of the 10 selected practices of high achieving schools. This outcome-based evaluation research study was conducted to investigate the influence of PD on teachers' shared values, collaboration, and instructional practices regarding instructional technology.

TPACK Survey

Data Collection Process

I collected data for this study using a self-administered survey, six one-on-one interviews, and six classroom observations. The teachers selected for interview were also selected for one classroom observation. After a signing a consent form, each teacher individually received the survey and informed that I would pick the survey up on a subsequent visit to the school. Upon return to the school, I picked up the surveys and placed them in a folder which was kept on my person until I left the school. I took the surveys to my home and placed them in a locked filing cabinet until I could analyze the data. Data will be kept secure by the use of codes in place of names and locked in a secure area in my home. Data will be kept for a period of at least five years, as required by the university. All teachers were given the opportunity to complete a self-administered survey focusing on teachers' knowledge of teaching and technology. 18 out of 20

teachers at the school completed the survey. I analyzed data gained from the surveys using the SPSS computer program and descriptive statistics. A chi-square, which consisted of a two by two table, was used to analyze the survey data. The survey responses were categorized and sorted as to increase in technology use or no increase in technology use, as well as sorting the teachers as to novice or veteran.

Interviews

Data Collection

I developed interview questions to explore novice and veteran teachers' views on how the PD influenced their use of technology in their instructional teaching practices. Interviews were held in a location selected by each participant: either in the participant's classroom or an isolated room selected by the participant. The interviews lasted approximately 30 minutes each and consisted of ten open-ended questions. Follow-up questions were asked to provide further explanation or clarification for participants when necessary. The follow-up questions also provided me with additional explanation or clarification of the participants' answers when needed. I recorded the interviews on my iPhone and then transferred the recordings to an external hard drive, which I locked in a filing cabinet until the interviews could be transcribed. Data will be kept secure by the use of codes in place of names and locked in a secure area my home for a period of at least five years, as required by the university. Once I transcribed the interviews, each participant was given the opportunity to review their interview transcript through the use of a member check. Member checking allowed me to determine the accuracy of my findings by asking participants to assert the correctness of several aspects of the study,

including whether the description is complete and truthful, if the themes are accurate, and if the interpretations are reasonable and representative (Creswell, 2012).

Classroom Observations

Data Collection

Once the interviews were completed, I observed participants teaching a lesson in their classroom. The lessons varied based on the subject being taught. Observations last for one class period (45 minutes). I recorded the data from these observations on an observation protocol form that I developed for this purpose. I placed the observation protocol forms in a folder which was kept on my person until I left the school and transported them to my home. I then placed them in a locked filing cabinet until I could analyze the data.

I used open coding to code the data collected from participant interviews and classroom observations. Seven themes emerged. I looked for discrepant cases in the data but found none. Through the research questions I developed for this study, I attempted to evaluate whether the PD influenced teachers' shared values regarding instructional technology, and their collaboration and instructional practices using instructional technology. Through the research questions that I developed for this study, I evaluated the influence of the PD on teachers' shared values, collaboration, and instructional practices regarding instructional technology.

Research Questions

In alignment with Mishra and Koehler's (2006) TPACK theory and Guskey's (2002) five levels of PD evaluation, I evaluated the influence of the PD on teachers'

shared values, collaboration, and instructional practices regarding instructional technology. I developed the following research questions to guide my study:

Research Question 1: How do teachers demonstrate collaboration using instructional technology because of their professional development?

Research Question 2: What shared values have teachers adopted regarding instructional technology because of their professional development?

Research Question 3: How have the authentic teaching practices of participants changed because of the technology professional development as identified by the principles of TPACK?

I designed Research Questions 1 and 2 to be answered through data gathered during one-on-one interviews and classroom observations. I designed Research Question 3 to be answered through data collected from the self-administered survey. The coding and analysis of the data collected is described below.

Qualitative Findings

Research Question 1. How do teachers demonstrate collaboration using instructional technology because of their PD? Through one-on-one interviews and classroom observations with six selected participants, I posed questions intended to elicit responses to evaluate how the PD influenced teachers' collaboration and instructional practices using instructional technology. I allowed participants the opportunity to express their thoughts and feelings regarding the influence of the PD on teachers' collaboration and instructional practices using instructional technology. Participants had the opportunity to provide examples of using the strategies provided by the PD in their

instructional practices within their classroom. Some examples include (a) participant T3 stated, “students use Kahootit”; (b) participant T17 stated, “students use Flocabulary, Kahootit, IXL, and Study Island”; (c) participant T8 stated, “students look up the design for a lab experiment, follow the schematic drawings, and build the experiment.” Through the interview process, I asked clarifying questions to identify themes that emerged from their responses. Seven themes emerged: (a) increase in the level of expertise in using technology within instructional practices, (b) increase in the level of use of technology within the classroom, (c) increase in collaboration among colleagues using technology in instructional practices, (d) increase in shared values among colleagues regarding instructional technology, (e) PD offered several strategies to incorporate the use of technology, (f) increase in authentic teaching practices, and (g) newer technology preferred over older technology. The data showed increases in the level of expertise in using technology within instructional practices and in the level of use of technology within the classroom. There was also an increase in collaboration among colleagues using technology in instructional practices.

Research Question 2. What shared values have teachers adopted regarding instructional technology because of their PD? Through one-on-one interviews and classroom observations with six selected participants, I posed questions intended to elicit responses to evaluate how the PD influenced teachers’ shared values regarding instructional technology. I asked questions to allow participants the opportunity to express their thoughts and feelings regarding the influence of the PD on teachers’ shared values regarding instructional technology. Participants were given the opportunity to

provide examples of using the strategies provided by the PD in their instructional practices within their classroom. Some examples include (a) participant T5 stated, "students used We Video to create movie trailers for the novel *The Outsiders*"; (b) participant T16 stated, "I used the Google Arts portal to walk through famous museums with my class"; (c) participant T18 stated, "My students do a research project in which they research a European Medieval castle. Student search Google, evaluate websites, find information on their castle, and create a report on their castle. The group leader posts the report to Google Classroom." Through the interview process, I asked clarifying questions to identify themes that emerged from their responses. The data showed increases in the level of expertise in using technology within instructional practices and in the level of use of technology within the classroom. There was also an increase in shared values among colleagues regarding instructional technology. An additional finding of the data was shared values among students as well.

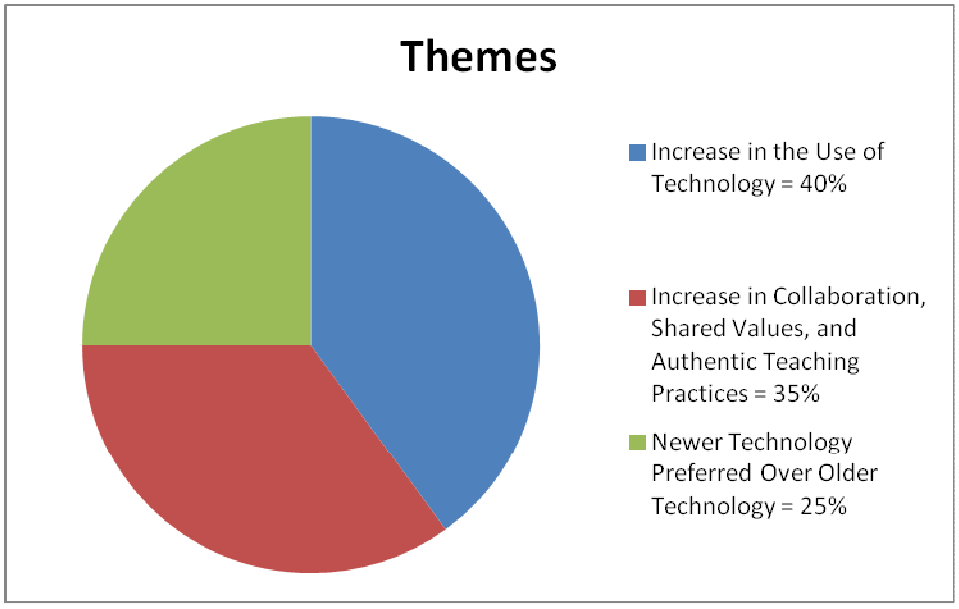

Figure 1. Initial themes from interviews and classroom observations.

In addition to the initial themes, seven themes emerged from the interviews and classroom observations: a) increase in the level of expertise in using technology within instructional practices; b) increase in the level of use of technology within the classroom; c) increase in collaboration among colleagues using technology in instructional practices; d) increase in shared values among colleagues regarding instructional technology; e) PD offered several strategies to incorporate the use of technology; f) increase in authentic teaching practices; g) newer technology preferred over older technology. I will discuss findings for these themes in the following sections.

Theme 1

The findings from the one-on-one interviews showed that most teachers ranked their level of expertise in using technology within their instructional practices prior to the PD as moderate. T1, T2, T4, and T5 all ranked their level of expertise as moderate. T6 ranked his level of expertise as low, and T3 ranked her level of expertise as high.

Theme 2

The findings from the one-on-one interviews showed that half of the teachers ranked their level of use of technology within their classrooms as moderate as well. T2, T3, T5 ranked their level of use of technology within their classrooms as moderate. T4 and T6 ranked their level of use as low, and T1 ranked her level of use as high.

Theme 3

The findings from the one-on-one interviews showed that multiple teachers saw an increase in collaboration among colleagues after the technology PD. T3 and T5 both stated, “We collaborate with each other in regard to projects that can be tied together for

both classes," and, "through these projects, students are able to see what is going on in the world at a specific time in history." T6 "regularly collaborates with math teachers in regard to how mathematics can be applied to topics in class."

Theme 4

The findings from the one-on-one interviews showed an increase in shared values among not only colleagues, but among students as well. T4 stated, "A shared value that has been seen is teachers pushing students harder than what's normally expected." T5 stated, "A shared value that has been seen is students taking more ownership in the lessons when technology is incorporated." T3 stated, "A shared value that has been seen is in the area of decision making and change." T3 further concluded that, "Students realize things are not just about them, but about the class as a whole. This can be applied to teachers as well. As teachers see the positive results from having shared values, teachers realize things are not just about them, but the school, and the learning environment, as a whole."

Theme 5

The findings from the one-on-one interviews showed that as a result of the technology PD teachers were given multiple strategies and tools to incorporate the use of technology into instructional strategies. T1 stated, "Strategies that have been incorporated since the technology PD include any technology that is available. With the technology grant, the school was able to purchase 87 Samsung Galaxy 4 tablets. However, due to the wear and tear over the years, along with the out-datedness of the tablets, many students in my class elect to use the Chromebooks that were purchased two years after the grant was

received." When asked about strategies that have been incorporated into his classroom since the technology PD, T2 stated, "Students use both the tablets and the Chromebooks." T4 stated, "The incorporation of technology into projects and assignments makes the activities more engaging." I also observed this during my classroom observation of his classroom. T3, T5, and T6 provided examples of specific strategies from the technology PD that they have incorporated into their instructional practices: T3 has incorporated strategies such as Three Post-It Notes and What, So What, and Now What; T6 has incorporated the use of Google Maps to locate and study about specific locations, which I observed during his classroom observation; T5 has incorporated many of the Google platform tools into her classroom. She currently uses Google Classroom, Google docs, and Google forms. T5 uses Google forms to create a spreadsheet to see the most missed questions on an assignment.

Theme 6

The findings from the one-on-one interviews showed changes in authentic teaching practices because of the technology PD. Authentic teaching is defined as a multifaceted approach to teaching based on four principles: genuineness, being consistent in values and actions, a relationship with others which encourages them to be authentic, and living a life that is considered critical (Cranton & Carusetta, 2004). T2 stated, "Access to the internet has increased student level of science knowledge greatly." T1 stated, "Having technology for the students to use has allowed me to utilize information about how the students are learning from the technology to design lessons to improve their learning and interest." T6 stated, "I have incorporated more hands-on and

technology lessons." One example of a hands-on, technology lesson that I observed in his classroom was the use of the tablets to research new places. He noted, "Students are used to growing up touching that screen and working that way, as opposed to turning pages." T4 stated, "Due to teaching field and location, I cannot implement some of the things." He also noted, "There is not the technology there to implement it with." T3 stated, "The authentic teaching has helped students in connecting learning to life", and, "I think it helps connect teaching and learning to assignments and projects that students see as having a value beyond the classroom." T5 stated, "Because of the technology PD, I am more willing to go out and find different apps and technology to use in my classroom than I was prior to the technology PD."

Theme 7

The findings from the one-on-one interviews showed that the majority of the participants preferred to use newer technology over older technology. At the time of this study, the tablets were being used for the third year. The school also purchased classroom sets of Chromebooks two years after receiving the technology grant. During a classroom observation in participant T1's classroom, T1 showed the visible wear and tear on many of the tablets. Some tablets were warped due to heat, which was most likely caused due to the need for charging after each use. Many of the tablets also appeared to have liquid under the screen. The tablets came with wireless keyboards; however, the participant stated that, due to connectivity issues, it was easier for students to use the tablets without the wireless keyboard. During this classroom observation, participant T1 asked her students whether they preferred to work on the tablets or the Chromebooks and why.

Students stated, “We prefer to use the Chromebooks because they were easier to type on, easier to log into the internet on, and just easier, faster, to use in general.” Due to the popularity of the Chromebooks with the students, T5 stated, “I plan to use my summer to look into apps that are available on the Chromebook.” T3 stated, “I would like to see funding targeted only for technology. I feel this would be beneficial to ensure the school doesn’t start funding, and I am afraid money will not be available to replace the technology from the grant.” All participants agreed that the knowledge gained from the technology PD can be applied not only to the tablets but also to technology that may be received in the future.

Salient Data and Discrepant Cases

The salient, or most noticeable, patterns in the data resulted from the common desire among the participants to apply what was learned in the PD and increase the use of technology within instructional practices. During the data collection and data analysis, no discrepancies were found in the data between the results from the surveys, interviews, or classroom observations. The data and the related analysis are substantiated by the lack of discrepancies.

Study Procedures for Accuracy

As recommended by Creswell (2012), I ensured the findings and interpretations of the data were accurate. Creswell defines validating findings as “determin[ing] the accuracy or credibility of the findings through strategies such as member checking and triangulation” (2012, p. 259). To validate the findings of this study, I used multiple tools for triangulation, member checks, and peer debriefing. Data collection tools I used for

this study included the TPACK survey (see Appendix B), 60- minute one-on-one interviews (see Appendix C), and 45- minute classroom observations (see Appendix D). Open coding codes and transcript excerpts for Research Question 1 are located in Appendix E. Open coding codes and transcript excerpts for Research Question 2 are located in Appendix F.

Quantitative Findings

Research Question 3. How have the authentic teaching practices of participants changed because of the technology PD as identified by the principles of TPACK? Through the self-administered TPACK survey, I posed questions intended to elicit responses to evaluate how the PD influenced teachers' authentic teaching practices as identified by the principles of TPACK. Specifically, questions 51-53 asked participants to describe a specific situation where a PD instructor, one of their colleagues, and the participant effectively demonstrated or modeled techniques which combined content, technologies and teaching approaches in a classroom lesson. Through the use of the Likert-type survey, I evaluated participants' use of technology in their instructional practices. Specifically, questions 43-46 asked participants to rate their ability to combine technologies and teaching approaches with core subject areas. A chi-square was used to illustrate the survey results. This analysis assessed the presence of an association between veteran and novice teachers and their use of technology in instructional practices after the OETT PD. Participants were categorized as novice or veteran teachers. Novice teachers were defined as teachers with less than five years teaching experience, and veteran teachers were defined as teachers with five or more years of teaching experience. Based

on the findings of the data, 14 participants were categorized as veteran, and four participants were categorized as novice. All participants showed an increase in technology use in their instructional practices because of the technology PD.

I used descriptive statistics to illustrate the quantitative findings of this study. When researchers are working with categorical variables, it is important that they determine and report the mode of the variables (Creswell, 2012). Slightly more than three-fourths of the participants in the sample were considered veteran teachers. In Table 2, the categorical variable is years of experience affiliation. In this table, I illustrated the frequency of each group, as well as the percent and valid percent. The percent and valid percent for each group are equivalent because no data was missing that would have needed to be excluded from the calculations.

Table 2

Descriptive Statistics for Teachers' Years of Experience Affiliation

	Frequency	Percent	Valid Percent
Novice	4	22.2	22.2
Veteran	14	77.8	77.8
Total	18	100.0	100.0

For the categorical variable of technology use after the OETT PD, 18 exhibited an increase in technology use. Again, the percent and valid percent for each group are equivalent because no data was missing which would have needed to be excluded from the calculations.

Summary of Outcomes

The study addressed the problem of whether the training was successful for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. It is also unknown what influence PD had on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools. The outcomes connected to the analysis of all three data sources supported this study's problem and research questions. I developed the research questions to meet the need for a program evaluation to determine how the PD influenced teachers' shared values, collaboration, instructional practices regarding instructional technology. Common themes among participants' interview responses and classroom observation data were identified. The findings of the data from the survey, interview responses, and classroom observations conclude the PD had a positive influence on teachers' shared values, collaboration, and instructional practices regarding instructional technology. I created an Evaluation Report of my findings for FVMS. The Evaluation Report is designed to support administrators at FVMS in their determination of the effectiveness of the PD provided to the school as part of the OETT grant.

Summary

This section outlined the methodology associated with this study. Points included mixed method design and approach, setting and sample, data collection strategies, data analysis, limitations, data analysis results, summary of outcomes, and a project deliverable. The mixed method design and approach included both qualitative and

quantitative strategies. While the sample was small, I ran a GPower to determine the effectiveness of the sample size. My data collection strategies included a Likert-type survey, interviews, and classroom observations. My data analysis included the use of a chi-square to determine the effectiveness of the PD based on the responses to the Likert-type survey and thematic coding to determine the effectiveness of the PD based on the one-on-one interviews and classroom observations. The chi-square illustrated the number of novice versus veteran teachers and each group's increase, or lack of, in technology use. Based on the number of teachers who showed an increase in technology use based on the chi-square and the themes that emerged during thematic coding, I determined the PD had a positive effect on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools.

Section 3: The Project

Introduction

In this section, the evaluation report that was developed, which was the project of this study, will be discussed. At the study site, there was a lack of technology and a lack of knowledge pertaining to the use of technology in the curriculum. In response to this, FVMS applied for and received an OETT grant. According to the principal, prior to receiving this grant, 60% of teachers were using little to no technology in their teaching practices. This grant provided both technology and PD instruction on the use of the technology and tools. I used an outcomes-based program evaluation to determine whether training was successful for the implementation of teacher collaboration, shared values, and authentic teaching practices. A program evaluation also helped to determine what influence PD had on teachers' implementation of instructional strategies while incorporating technology. In this section, the project, its goals, and rationale will be discussed. This section also includes a review of the literature that supports the use of program evaluations and the genre of the project (i.e., evaluation report). Lastly, this section includes a project description and project implementation.

Description and Goals of Project

A program evaluation is defined as collecting information on programs to judge their effectiveness and improve it or make decisions on future programs (Patton, 2015). My goal was to conduct a program evaluation to examine whether the technological PD provided by the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values,

and authentic teaching practices. I decided to conduct a mixed methods outcome-based program evaluation. This design allowed me to examine how the technological PD provided by the OETT grant influenced teachers' shared values regarding instructional technology, and their collaboration and instructional practices using instructional technology. I used the following research questions to drive the evaluation:

Research Question 1: How do teachers demonstrate collaboration using instructional technology because of their professional development?

Research Question 2: What shared values have teachers adopted regarding instructional technology because of their professional development?

Research Question 3: How have the authentic teaching practices of participants changed because of the technology professional development as identified by the principles of TPACK?

The project for this doctoral study culminated in an evaluation report (see Appendix A). The findings of the outcome-based program evaluation shaped the recommendations that I will present to FVMS administrators in the evaluation report (see Appendix A). The purpose of the evaluation report is to communicate findings, conclusions, and make recommendations. For this study, the recommendations are based on the results of the outcome-based program evaluation of how the technological PD provided by the OETT grant influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology.

Rationale

This project addressed whether training was successful for the implementation of the three strategies specified in the OETT grant: teacher collaboration, shared values, and authentic teaching practices. In addition, this project was conducted to evaluate what influence PD had on teachers' implementation of instructional strategies while incorporating technology with these strategies. Therefore, this program evaluation study addressed a gap in practice regarding the technology PD provided by the OETT grant. I selected an evaluation report because it helped determine the effectiveness of the technological PD provided by the OETT grant and its influence on shared values, collaboration, and instructional practices. The final evaluation report is a key part of any evaluation process (Seberova & Malcik, 2010). The evaluation report was developed to address the gap in practice and to evaluate whether training was successful for the implementation of teacher collaboration, shared values, and authentic teaching practices. The data analysis from Section 2 of this project study formed the basis for the evaluation report, which I used as research findings, recommendations, and implications to bring about positive social change.

Review of the Literature

Research was examined to show the rationale for an evaluation report, program evaluation, a relationship between teachers' levels of TPACK knowledge and integration of technology into instructional strategies, and the benefits of PD in teachers' abilities to implement technology into instructional strategies. The literature review contains three subsections: (a) the Project Genre subsection includes a description of the genre selected

for this project as it relates to defining evaluation report, rationale for evaluation report, and the use of program evaluations; (b) the Supporting the Use of Technology subsection includes a description of the relationships between teachers' levels of TPACK knowledge and integration of technology into instructional strategies; and (c) the Supporting Growth and Collaboration subsection includes a description of the benefits of PD in teachers' abilities to implement technology in instructional strategies. The databases used for the literature review include Education Source, Eric, SAGE Journals, and ProQuest Central. Key terms used for the search included *collaboration, shared values, instructional methods, technology, instructional technology, instructional strategies, educational technology, TPACK, professional development, benefits of professional development, program evaluation, outcome-based evaluation,* and *evaluation report*.

Project Genre

Program evaluation involves the collection and analysis of data pertaining to a program in which the results are used by the stakeholders to make improvements for future delivery of the program (Moreno, 2014). The goal of program evaluation is to provide the stakeholder with the necessary information to adjust the planning of curriculum and not exclusively provide the guidelines by which to make adjustments (Moreno, 2014). Program evaluations can serve in a formative or summative manner, can be administered and analyzed by internal or external bodies, and can be conducted for a variety of circumstances with varied goals (Moreno, 2014). The program evaluation conducted at the study site in this study was summative and was administered and analyzed by an external evaluator.

Program evaluation also functions in a dual role: the process that will yield valuable data to the efficient delivery of a program or instruction, and the process that will help to better situate the music program within the greater educational context that it exists in (Moreno, 2014). The program evaluation that was conducted at FVMS has a dual role as well. First, it yielded insightful and valuable data as to whether the technological PD provided by the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. Second, it also helped to better situate the technology PD within the greater education context.

The process of program evaluation is imperative in shaping the relationship between larger stakeholder units (Moreno, 2014). The interaction between colleagues is an ongoing and developing relationship that is formed out of professional guidelines, regulations, and performance reviews but can also be informed by the information delivered through the program evaluation (Moreno, 2014). When conducting a program evaluation, the researcher must consider the stakeholders who are involved such as those providing and benefitting from the program (Franklin & Blankenberger, 2016). One of the crucial roles of program evaluation and systemic analysis of courses is to provide data that can be used in the shaping and reforming of current and future courses of instruction (Moreno, 2014). The program evaluation and analysis in this project study provided data that may be used in shaping future technology PD at the local site.

Whether present in education, enterprise, public service, or the armed forces, program evaluation is also an effective and essential component of ensuring a course's

success and student learning (Moreno, 2014). Professional learning leaders are now expected to ensure that the connections between their work and enhanced student learning are not just happenstance (Champion, 2015). Faculty who are dedicated to participating in the assessment process need to be provided with appropriate resources (Franklin & Blankenberger, 2016). At FVMS, the instructors who presented the technology PD were expected to ensure connections were made between the technology skills being presented and the knowledge base the teachers were gaining, which also enhanced student learning in the classroom.

Evaluation is not about quantitative versus qualitative methods; it is about the question being asked and what are its contexts, its stakeholders and reporting relationships, and the strands of purposes and contributions that are to be evaluated for rationality, outcomes, and impacts (Dauphinee, 2015). For a program evaluation to be effective, it requires that the participants are familiar with the center's organization and operations and that they agree on results (Franklin & Blankenberger, 2016). At FVMS, all teachers were familiar with the organization and operations at the school, and all teachers agreed that they wanted to see improvement in the use of technology within their instructional practices. As a result of the program evaluation at FVMS, stakeholders were presented with the results of the evaluation in the form of an evaluation report.

Resistance to participating in data collection often stems from people sensing they have not been kept informed, listened to, or adequately recognized for their investment of time or ideas (Champion, 2015). It is important to keep stakeholders informed with regular updates (Champion, 2015). Participants were kept informed with regular visits to

the school during data collection, and regular updates provided to the school. It is also important to provide timely information that can benefit participants or stakeholders. For example, Lixum (2013) conducted data analysis for an outcome-based pilot course that provided feedback for teachers to adjust the remainder of their courses. In the current study, an evaluation report was provided to the study site, which provided timely feedback to the school as they prepare future PD sessions.

Evaluation reports are useful when used to inform stakeholders of program evaluation findings and conclusions (Schalock et al., 2014). It is the only evidence for partners or external critics who are not part of the whole process (Seberova & Malcik, 2010). For the purposes of the primary dissemination, a detailed version with all the evidence and supporting papers in the form of analyzed documents, collected questionnaires, or observation sheets is compiled (Seberova & Malcik, 2010). The report can have a written form, or it can be complemented with video records or film presentation (Seberova & Malcik, 2010). The evaluation report that was a result of this study was a written form. The secondary dissemination considers the specific requirements and needs of school partners or external clients and tailors the report to them (Seberova & Malcik, 2010). The evaluation report was provided to the administrators at FVMS as the primary dissemination of the results of the study. The administrators at FVMS will take the evaluation report and share it with the faculty and staff at FVMS and tailor the report to their needs as the secondary dissemination of the results of the study.

There was only a need for one evaluation report to be created for FVMS. The evaluation report included findings from all teachers. This report will be used by administrators at the school to determine what influence PD had on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools and to plan future PD offerings. The report will also be used to plan future technology PD for the school.

Supporting the Use of Technology

The relationship between the three components of content, pedagogy, and technology are a core of teaching when incorporating technology (Koehler et al., 2013). The variations in the extent and quality of educational technology integration are attributed to the interactions between the three components (Koehler et al., 2013). The core of the TPACK framework are formed from these three knowledge bases (Koehler et al., 2013). For the last two decades, ICT has led to use of technology in classrooms around the world (Murthy, Iyer, & Warriem, 2015). In previous years, FVMS strove to implement technology into the classrooms. However, the technology gained was limited, and there was little PD provided for the use of the technology.

The elements of content, pedagogy, and technology must be approached simultaneously for successful technology integration (Mishra & Koehler, 2006). The TPACK framework is used in a range of K-12 teacher education research literature. The focus of this inquiry is focused on the knowledge and application that pre-service and in-service educators bring to their classrooms (Benson & Ward, 2013). Knowledge domains were illustrated as circles of equal size in the original TPACK model. There were equal

overlapping areas, and in the Venn center were Pedagogical, Content, and Technological Knowledge which came together to influence student learning (Benson & Ward, 2013). "With respect to the integrative view of TPACK, it can be observed that the description of an educational experience can address different aspects, including how it was devised, how it was implemented, what was important when it was conceived and what surfaced as important after completion" (Di Blas et al., 2014, p. 4). High technological knowledge alone is inadequate for TPACK development, and pedagogical knowledge is also needed for TPACK development (Benson & Ward, 2013). The technology PD at FVMS allowed teachers to build their technological knowledge and their pedagogical knowledge as they learned to increase the use of technology in their instructional practices.

Koehler and Mishra (2005) also argued that TPACK is best developed through design experiences of pre-service teachers with concrete scenarios which allow them to integrate different TPACK factors. The relationships between teaching and technology are also complicated by social and contextual factors (Koehler et al., 2013). Educators' efforts to integrate technology use in their work are often not supported by social and institutional contexts (Koehler, et al., 2013). Teachers often have inadequate experiences using digital technologies for teaching and learning (Koehler, et al., 2013). Many teachers who earned degrees when technology used in education was at a different stage of development do not consider themselves adequately prepared to use today's technology in the classroom (Koehler, et al., 2013). An approach is needed that portrays teaching as an interaction between what educators know and how they apply this knowledge in their classrooms (Koehler, et al., 2013). Educators gained teaching knowledge and skills that

showcased the interaction of their knowledge and how they applied their knowledge in their classrooms through the technology PD at FVMS.

TPACK is the foundation of effective teaching with technology. Comprehension of instructional strategies using technologies, pedagogical techniques that use technologies to teach content, an understanding of what makes concepts difficult or easy to acquire, how technology can help remedy some of the challenges that students encounter, knowledge of students' prior knowledge, and knowledge of how technologies can be used to expand on existing knowledge are the basis of TPACK and effective teaching (Koehler, et al., 2013). There are many benefits offered by TPACK for preparing teachers to implement technology in the classroom (Tokmak, Yelken, & Konokman, 2013). In a study by Hughes (2013), the analysis of the respondents' reasoning for their most valuable learning technologies indicated a well-developed sense of technological pedagogical knowledge, yet they typically do not draw on more than technological pedagogical knowledge to define their valued learning technologies.

Stes et al. (2013) found many educators are confident about their TPACK skills and intend to use ICT in teaching; however, they do not make changes in real practice, achieve long-term influences on student learning, or an overall change in teaching and learning within the organization. A significant finding of Uluyol and Sahin's (2016) study was teachers' ICT use in the classroom was almost entirely limited to presentation technologies. The results of Uluyol and Sahin's (2016) study indicated that teachers often used readily available presentation technologies, such as projection, images, graphics, videos and animations, within their lessons. The technology PD at FVMS included

sharing tools and techniques for integrating specific technologies into teachers' instructional strategies, including technologies that moved technology in the classroom from presentation-centered to student-centered.

In an evaluation study by Wu et al. (2016), many participants realized the usefulness of open educational resources and state-of-the-art educational technology in their teaching practice. Participants perceived that collaboration may be stimulated by the design of IT-related learning activities (Wu et al., 2016). Educators' reaction toward ICT in education, confidence of TPACK competence, instructional practice around ICT integration, student learning, and department adjustment can achieve a holistic, multilevel evaluation outcome (Wu et al., 2016). The study suggested an effective strategy was allowing new higher education teachers to learn from creating an online course, in which all related topics will be covered (Wu et al., 2016). State-of-the-art educational technology, as well as training on how to use the technology, was made available to teachers at FVMS as a result of the OETT grant. The technology PD allowed teachers at FVMS to collaborate and share ideas related to the use of educational technology.

One of the most important factors in ICT integration is teachers and their motivation (Uluyol and Sahin, 2016). In schools, teachers play an important role in assimilating ICT. Teachers who are motivated display higher levels of ICT use in their classrooms (Uluyol & Sahin, 2016). Teachers face internal barriers that come from their own biases and experiences with technology (Minshew & Anderson, 2015). Failure to tend to external barriers such as PD can heighten internal factors such as technological and pedagogical knowledge and subsequently self-efficacy, attitudes, and motivation

(Oliver & Townsend, 2013). Efficacy can be a strong predictor of whether the knowledge acquired from professional development will be translated into instructional practice by teachers (Skoretz & Childress, 2013). An individual's judgment of his/ her perceived capabilities to succeed will influence the individual's choice of whether or not to engage in an activity (Skoretz & Childress, 2013). It takes time to develop efficacy for technology integration and subsequent implementation in the classroom (Skoretz & Childress, 2013). At FVMS, it was important to develop teachers' efficacy for integrating technology to ensure teachers' transferred the knowledge gained in the PD to their instructional practices.

The TPACK framework has been widely adopted to measure teachers' ICT integration competence (Koehler & Mishra, 2009). Educators have often not been provided with adequate training for technology integration (Koehler, et al., 2013). When educators lack the knowledge to use technology, their attempts to successfully integrate technology are often limited (Koehler et al., 2014). With regard to teacher technological and pedagogical knowledge, many authors have noted teacher knowledge and practice are widely divergent based on quality of training or years of experience. Attempts have been made to categorize levels of technology integration to show where teachers lie on a continuum of very basic, teacher-centered integration, to more expert, student-centered integration (Oliver & Townsend, 2013). The continual creation, maintenance, and re-establishment of a dynamic equilibrium among all components is required for successful teaching with technology (Koehler et al., 2013). Technology should be used as a more effective tool in education and as part of the learning process (Coskun, 2015). Through

the knowledge and experience gained in the technology PD, teachers at FVMS were able to use technology as an effective tool in their instructional practices.

Skoretz and Childress (2013) conducted a program evaluation whose purpose was to evaluate the influence of a school-based professional development program on educator efficacy for technology integration. Skoretz and Childress's (2013) findings indicated there was not a compelling change in the amount of technology integration after the experimental group's participation in a PD program. This was not the case at the study site in this study. All teachers showed an increase in the implementation of technology into instructional practices after the technology PD. Additionally, there were no compelling differences based on years of teaching experience, subject area, or grade level (Skoretz & Childress, 2013). At FVMS, a difference existed in the ways in which technology was used in instructional practices between novice and veteran teachers. Teachers with more years of experience the teacher implemented technology into their instructional practices in fewer ways. Educators who participate in a PD program score substantially higher in the amount of efficacy for technology integration (Skoretz & Childress, 2013). Evans et al. (2015) used the TPACK framework in a case study to describe how teachers implemented an iPad specific learning game that focused on fractions. Substantial changes in practice and instruction occurred for these teachers and their students as a result of the implementation (Evans et al., 2015). This was also the case at FVMS. Significant changes in practice and instruction took place as a result of the PD provided by the OETT grant.

Supporting Growth

A need for continued technological professional development. PD programs are systematic attempts to bring about modifications in the classroom practices of educators, in their attitudes and beliefs, and in the learning results of students (Guskey, 2002). PD activities are often designed to initiate modifications in teachers' attitudes, beliefs, and perceptions (Guskey, 2002). PD leaders frequently attempt to modify educators' beliefs about certain aspects of teaching or the desirability of a particular instructional innovation (Guskey, 2002). For change to occur, the role leadership presents in the innovation of change must be acknowledged (Thomas et al., 2013). A leader must be aligned with particular current best practices related with desirable results to be successful in technology (Brown, 2014). The process of teacher change is a key factor that many PD programs fail to consider (Guskey, 2002). According to the U.S. Department of Education (2010), educators are not well trained to use technology in their instructional practice (Skoretz & Childress, 2013). There is an obligation to provide effective training on technology implementation into instructional practice (Uluyol & Sahin, 2016). Successful behaviors are strengthened and likely to be repeated, while those that are unsuccessful aim to be dismissed (Guskey, 2002). If modifications in educators' attitudes and beliefs take place primarily before implementation of a new program or innovation, the quality of the introductory training is crucial (Guskey, 2002). Such change takes place mainly after implementation occurs and there is confirmation of improved student learning, continued follow-up support, and demand pressure following the introductory training that is even more crucial (Guskey, 2002). Effective professional

development should be established on knowledge integration (Benson & Ward, 2013). This integrated knowledge enhances a process of comprehending technology that includes pedagogy and content rather than a secluded set of skills or knowledge (Benson & Ward, 2013). The technology PD at FVMS was key in providing teacher change in regards to implementing technology into instructional practices.

Coaching is a type of technology integration training application that involves experienced technology-using mentors guiding educators who are less experienced with technology integration (Oliver & Townsend, 2013). Professional learning communities may include educators who work collaboratively to continuously study and boost student learning (Oliver & Townsend, 2013). The technology PD provided by the OETT grant is this type of training. The PD training took place once a month, over the course of a school year. Tokmak, Baturay, and Fadde (2013) conducted a study which focused on making decisions to improve an online master's program. This process included identifying the needs of stakeholders (Tokmak, et al., 2013). At FVMS, the need for technology and a knowledge for how to use the technology was identified prior to the application for the OETT grant.

Leadership is essential in developing new ways to transform educator preparation programs into TPACK enriched environments (Thomas et al., 2013). Visions communicated in a top-down fashion are unlikely to inspire people (Thomas et al., 2013). Therefore, all stakeholders should be engaged in setting goals (Thomas et al., 2013). Faculty are in the best position to relate how TPACK knowledge and skills will best fit into their courses, as well as to recognize the knowledge and skills they need to possess

to create authentic learning experiences in their classrooms (Thomas et al., 2013). To heighten the change process, leaders must find the best methods to motivate faculty to embrace the change (Thomas et al., 2013). All stakeholders at FVMS were committed to increasing the use of technology in instructional practices through increased collaboration, shared values, and authentic teaching practices.

Opportunities to be the student are more beneficial than PD that models how online technology applications work, (Benson & Ward, 2013). Benson and Ward (2013) observed the value and knowledge acquired when educators had the opportunity to experience the classroom environment as learners before they became the educator in the same environment. The same can be said for teachers at FVMS and their need to observe colleagues with a high level of TPACK skills who effectively integrate technology into instructional strategies. There are numerous technologies that an educational technology leader can utilize when devising a professional learning network (Brown, 2014). An example includes the Web 2.0 tool, designed for promoting collaborative technology opportunities for leaders (Brown, 2014). Technology PD provided as part of the OETT grant included staff members from the K20 Center, allowing time to study the site. This opportunity allowed for the instruction and modeling of the tools chosen for presentation. In addition to the offered PD resources, teachers crafted individual strategies for enhancing personal knowledge for utilizing the app (Evans et al., 2015). Implementation of the app changed student learning experiences from didactic lectures to collaborative workshops, providing students with opportunities to work in pairs for direct application of the concepts. (Evans et al., 2015). The technology PD enabled teachers at FVMS to

develop personal techniques and practices designed to their increase knowledge of technology integration into daily instructional practices.

Murthy et al. (2015) found it is necessary for participants to attempt the activity before providing a modeled or detailed explanation when introducing a new instructional strategy. This sequence allows for practical experience with time built in for reflection (Murthy, et al., 2015). Participants acquire new instructional strategies and develop plans for implementation in their own class, providing them with the student perspective before transitioning to the role as teacher (Murthy, et al., 2015). Participants must be equipped with skills for implementing the technology as well as the pedagogical implications in the classroom, solidifying the role as teacher (Murthy, et al., 2015). Another technique used to promote technology integration included assessment of teacher technology competencies and classroom/student products (Oliver & Townsend, 2013). Recommendations for future studies should consider the effect of PD experiences for technology integration and utilization of iPads in classroom settings (Minshew & Anderson, 2015). There is a need for additional professional development with an emphasis in technology integration for successful technology integration (Skoretz & Childress, 2013). PD which integrates informal discussions offers time for trouble shooting and problem solving (Skoretz & Childress, 2013). Teachers require support when attempting classroom technology integration, especially when transitioning to actual implementation (Skoretz & Childress, 2013). The technology PD provided by the OETT grant provided teachers at FVMS with support as they strove to integrate more technology use into their instructional practices.

A new program or innovation must become a natural part of the educators' repertoire of teaching skills to be implemented successfully (Guskey, 2002). Teachers should develop habits for the new practices, especially for program continuation and expansion to occur effectively (Guskey, 2002). Educational technology continues to experience innovations and advancements, but the rapid change and ubiquity of technologies within the last decade are unprecedented (Kumar & Dawson, 2014). Organizations connected with teaching and learning continued attempts for technology integration into classroom practices. As a result, several new positions arose for professionals assisting with educational technology. This also created a need for existing professionals to learn and integrate technology into practices (Kumar & Dawson, 2014). Kumar and Dawson (2014) observed trends on students thinking differently about technology. Specifically, students reported reflecting on the theories behind protocols, expectations, and reasons for using technology (or not) and also appropriate use of technology in different settings (Kumar & Dawsom, 2014). Through the technology PD at FVMS, teachers were able to reflect on the use (or lack of) technology in their instructional practices. As the technology PD continued throughout the year, the amount and type of technology used by teachers in their instructional practices increased.

Collaboration. Moral (2014) and Suh and Seshaiyer (2013) identify collaboration as an essential twenty-first century skill, and both studies support professional learning as being enhanced by collaboration among peers. Working within collaborative groups fosters creativity, improves reflective practices, increases mutual respect, promotes team achievements, and enhances self-efficacy (Morel, 2014). Kang (2016) conducted a study

focusing on collaborative relationships between colleagues. Kang found that a literacy coach's collaboration with teachers resulted in growth professionally and collaboratively. In an attempt to implement recommendations of the evaluation report, FVMS could utilize a technology coach, similar to the literacy coach described in the above study. The technology coach's primary purpose would be assisting colleagues in more fully implementing technology into regular instructional strategies. Misfeldt and Zacho (2016) investigated how teachers addressed creativity and innovation by collaboratively developing resources supporting use of specific mathematical tools and open-ended projects. Some of the teachers at FVMS worked collaboratively to create projects including the integration of technology into instructional strategies and applications across multiple subject areas. It would be beneficial for FVMS if teachers successfully creating projects shared with others how to build units and successfully integrate technology within the projects.

Misfeldt and Zacho (2016) also investigated the use of specific mathematical tools and open-ended projects and the effect of educators' collaboration on scenario design. Teachers used Google sites to establish web-based teaching materials. Almost all teachers in Misfeldt and Zacho's (2016) study created a Google site immediately after instruction; however, many of the teachers never built their site independently. Teachers at FVMS have implemented some of the technology from the technology PD. However, the levels of implementation vary greatly among teachers.

Kelly and Cherkowski (2015) conducted a study in which the initiative displayed a trend toward devising inclusive classrooms where educators worked collaboratively

with literacy resource teachers to present quality instruction for all students. Kelly and Cherkowski (2015) described and analyzed the educators' experiences with collaboration in a professional learning community. In a study about producing new professional identities through this occurrence, Kelly & Cherkowski (2015) found many benefits and challenges to creating and sustaining relationships with colleagues, determining norms and structures for collective learning. Establishing professional learning communities could be a method for developing skills and knowledge needed to include TPACK in programs (Thomas et al., 2013). This collaboration should not only be promoted in students but also fostered among peers (Evans et al., 2015). The school district funded educator release time for seven professional learning community meeting days throughout the school year for participating classroom educators and literacy intervention teachers to support creating a team approach to literacy (Kelly & Cherkowski, 2015). To create a successful professional learning community culture in schools, it is important to provide opportunities for educators to meet and create a learning climate in which honesty and courage to share teaching practices are valued and welcomed (Kelly & Cherkowski, 2015). Collaboration is an effective learning strategy and is vital in a complex and global society (Morel, 2014). Practicing collaboration displays its importance for the students who will be called upon to work together in an increasingly complex economy and society (Morel, 2014). Through the technology PD, teachers at FVMS were able to collaborate on technology implementation in their instructional practices and model this collaboration for students.

Project Description

Needed Resources and Existing Supports

This section describes the resources and supports needed to develop and present the evaluation report. I served two roles: researcher and external evaluator for the program evaluation. The participating teachers affiliated with FVMS participated in self-administered surveys, one-on-one interviews, and classroom observations. The principal of FVMS granted permission to conduct the study. Prior to the research process, Walden University approved the evaluation report to be facilitated and presented to the stakeholders at FVMS. The stakeholders included teachers and administrators at FVMS. The existing supports are the teachers that provided their perceptions of the factors that enhanced or constrained the effectiveness of the technology PD provided by the OETT grant. After approval of the program evaluation, a time frame was established to present the findings and recommendations of the project and to present the evaluation report. Information was shared during one-on-one interviews of strategies from the technology PD that were effective and of other strategies that were ineffective. In addition, information was gathered through the self-administered surveys of each participant's technology knowledge, pedagogy knowledge, content knowledge, and TPACK levels. Through the classroom observations, I gathered information by observing the teachers' use of technology in instructional strategies. I presented the data collected through the surveys, interviews, and classroom observations in an evaluation report to communicate information for program effectiveness, program improvement, and future decision making.

Potential Barriers and Potential Solution to Barriers

No potential barriers were identified for the presentation of the outcome-based program evaluation report to be conducted at FVMS. It is my recommendation that the study site continue technology PD and allow teachers the time to observe colleagues' implementation of technology into instructional practices. If time does not permit teachers visiting colleagues' classrooms, this could be done using WeVideo or any other recording feature and shared with teachers.

Proposal for Implementation and Timetable

Upon completion and approval of this project study, inclusive of the evaluation report, the stakeholders at FVMS were notified regarding the presentation of the report. The presentation provided information collected and recommendations for continued implementation of technology in instructional strategies. There was time allocated for questions. The presentation was held in the media center at the local site for approximately one hour. The evaluation report was sent to the administrators prior to the presentation outlining points to be discussed and recommendations. Approximately one week after confirmation and consent for the presentation, dates and times had been arranged and all other participants informed.

Roles and Responsibilities

I had the responsibility of providing copies of the evaluation report to the stakeholders. Additionally, I assumed the responsibility of securing the meeting place, date, and time for the presentation of the findings and recommendations. The administrator provided the location of the meeting, along with monitoring the

presentation of the report. The participants were responsible for the discussion of factors that enhanced or constrained the effectiveness of the technology PD.

Project Implications

Local Community

This project study provided an evaluation of the effectiveness of the technology PD provided by the OETT grant at FVMS. The evaluation report will serve as a guide to school and district administrators in making recommendations for future technology PD at FVMS. The recommendations included continuing technology PD and to allow teachers time to observe colleagues' implementation of technology into instructional practices.

The evaluation report for this project study gave strong evidence that the technology PD provided by the OETT grant was successful in implementing the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. In addition, there was strong evidence that the technology PD positively influenced teachers' effective implementation of instructional strategies while incorporating technology with three of the 10 selected practices of high achieving schools. Strong evidence was also provided for the need to continue technology PD at FVMS. By sharing the perceptions of the stakeholders and including the factors that constrained and enhanced the effectiveness of the technology PD provided by the OETT grant, the school and district may provide continuous support to teachers as they strive for continued improvement of technology implementation in instructional practices.

Far-reaching

In a larger context, other districts in the state who have received the technology PD through the OETT grant can benefit from the evaluation report. The program evaluation can be used to evaluate the technology PD at other districts who have received the OETT grant. Other school districts can using the program evaluation can lead to continued improvement of technology PD, continued improvement of technology implementation in instructional practices, and positive social change in education.

Summary

This section outlined the description and goals of the project, rationale, and a review of the literature. A project description and project implications were included as well. I discussed the rationale for using a program evaluation and an evaluation report. I also discussed the evaluation report I developed. A strength of this project is that administrators can use it to examine the effectiveness of the PD in influencing teachers' shared values, collaboration, and instructional practices regarding instructional technology. I have gained personal reflections including learning what it means to be scholarly and how to collect and analyze research. I believe I have grown exponentially as a researcher. Many of the conclusions and findings from the study could have potential application throughout the world. The problem of not knowing whether PD training was successful in the implementation of instructional strategies and what influence it had on teachers' shared values, collaboration, and instructional practices regarding instructional technology is certainly not limited to the United States.

Section 4: Reflections and Conclusions

Introduction

For this project study, I examined whether training was successful for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. I also examined what influence PD had on teachers' implementation of instructional strategies while incorporating technology with three of the 10 selected practices of high achieving schools. I sought to gain an understanding of how the PD influenced teachers' shared values, collaboration, and instructional practices using instructional technology. An evaluation report was developed to discuss the program evaluation and findings. The subsections in this section include (a) project strengths and limitations; (b) recommendations for alternative approaches; (c) scholarship, project development, and leadership and change; (d) reflections on the importance of the work; and (e) implications, applications, and directions for future research.

Project Strengths and Limitations

Strengths

Program evaluation involves examining a program and its results to determine its effectiveness (Patton, 2015). PD needs to be evaluated to determine its effectiveness (Guskey, 2002). The first strength of this project is that administrators can use it to examine the effectiveness of the PD in influencing teachers' shared values, collaboration, and instructional practices regarding instructional technology. In creating the project, I considered the technology available, both before and after receiving the grant, to

potentially be implemented in instructional strategies. I formulated the project using the data collected during the study.

The data collected and analyzed from the TPACK survey were based on a 53 question survey designed to survey preservice teachers' knowledge of teaching and technology. Data collected and analyzed from the one-on-one interviews were based on 10 open-ended questions. This allowed me to identify the influence technology PD had on teachers' shared values regarding instructional technology, and their collaboration and instructional practices using instructional technology. The data collected and analyzed from the classroom observations were recorded on an observation protocol during a 45-minute visit to the classroom. The evaluation report helped outline the findings and recommendations for future decision-making.

An additional strength of the project is that it gives the teachers in the school examples of how various teachers have implemented technology in their instructional strategies because of the technology PD. Often there is not enough time for teachers to visit other classrooms to get additional ideas on how to implement the technology. The evaluation report contains examples of ways the technology is being implemented. A final strength of this project is that other districts may be able to adapt it to provide PD in implementing technology into instructional strategies for their teachers.

Limitations

Limitations existed as I developed the evaluation report. The first limitation pertained to the self-reported data collected from the TPACK survey, which was similar to limitations found by Gebre et al. (2015) and the use of self-reported data. A second

limitation of this study was it was built with the PD provided by the OETT grant in mind. It is possible that other districts will have different technology PD. If a district is not a recipient of the OETT grant, the evaluation report created for this study would be less beneficial to that district. Another limitation of this study is that the research was only conducted at one school that was a recipient of the OETT grant, preventing comparison of findings with other schools that have received the technology PD as part of the OETT grant. A final limitation of this study was the sample size. Although all but two teachers at the study school elected to participate in the study, the sample size for this study was 18 participants.

Recommendations for Alternative Approaches

I examined whether training was successful for the implementation of teacher collaboration, shared values, and authentic teaching practices as well as what influence PD had on teachers' implementation of instructional strategies. I collected data by first administering the TPACK survey, followed by participant interviews and classroom observations. I could have completed the classroom observations prior to interviewing participants to gain additional insight into the data collected in the classroom observations, which may be a consideration for future research.

Another alternative approach pertains to the study design, which could be a case study rather than a program evaluation. A case study would have allowed for the collection of data that was focused more on the activities of the group instead of the shared patterns that developed (Creswell, 2012). By designing a case study, PD could have been developed to support teachers' growth in the implementation of technology in

instructional practices. An alternative definition of the problem could include teacher buy-in of the implementation of technology in instructional practices. A second alternative definition of the problem could include the exploration of why teacher use of technology in instructional practices was low prior to the PD provided by the OETT grant.

Scholarship, Project Development and Evaluation, and Leadership and Change

As a doctoral student at Walden University, I have learned what it means to be scholarly. During this doctoral journey, I learned to conduct and analyze research. I also believe I became more skilled at conducting interviews and observations as well as analyzing results from data gained from surveys. Through the challenges I faced, I learned to overcome obstacles and to find a way to press on. I became more disciplined as both a student and an educator. I learned to plan, as well as manage, my time more efficiently to ensure schoolwork and professional work were completed in a timely manner.

Project Development

During the process of developing the project, my desire was to determine whether training was successful for the implementation of teacher collaboration, shared values, and authentic teaching practices. I also wanted to determine what influence PD had on teachers' implementation of instructional strategies while incorporating technology with three of the 10 selected practices of high achieving schools. After the first round of data was collected through the TPACK surveys, a pattern emerged in regards to teachers' level of TPACK knowledge and the integration of technology into instructional practices.

With this in mind, a literature review was conducted in which teachers' levels of TPACK knowledge and levels of integration of technology into instructional practices were researched. When I conducted the interviews and observations, several themes emerged. Many of the same themes emerged in both the interviews and observations. Through these themes and the literature researched, it became apparent technology PD increased teachers' levels of expertise and integration of technology into instructional practices, as well as increasing teachers' collaboration, shared values, and authentic teaching practices. This process has taught me the value of collecting and analyzing data to design a program evaluation and develop an evaluation report to meet the needs of the participants. The expertise I gained through this process will help me when I design future program evaluations.

Leadership and Change

The development of the evaluation report has allowed me to learn important lessons related to leadership and change. I began my doctoral journey as an educator who would take a stand for my students both in and outside of the classroom. However, that is where my boldness ended. I never saw myself as a leader; instead, I mostly took on the role of follower. Through this doctoral journey, I found myself in a leadership role. From project development to collecting and analyzing data, I was the leader. I was the one directing the path the study would take. I have always been a good follower, but this journey allowed me to be a good leader as well. Through this project study, I was able to enhance my leadership skills.

Reflection on Importance of the Work

The outcome-based evaluation conducted as part of the development of the evaluation report was important because it helped to determine the level of effectiveness of the training for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. I also wanted to determine what influence PD had on teachers' implementation of instructional strategies while incorporating technology with three of the 10 selected practices of high achieving schools. This study will contribute to the growing body of research on the topic of technology PD. The findings of my program evaluation indicated that technology PD increased the implementation of teacher collaboration, shared values, and authentic teaching practices. The technology PD also had a positive influence on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools. Participants expressed they have not had the opportunity to observe colleagues' implementation of technology into instructional practices. To address this issue, I made recommendations to the study site to continue technology PD and allow teachers time to observe colleagues' implementation of technology into instructional practices. The potential influence on social change will be driven by the partnership between teachers, administrators, and staff to continue the increase in technology implementation into instructional practices and technology PD at the local, state, and national levels.

Implications, Applications, and Directions for Future Research

This project study was grounded in Mishra and Koehler's (2006) TPACK theory, as it underpinned the conceptual framework that guided the OETT grant program, and Guskey's five levels of PD evaluation (Guskey, 2002). The literature review and the findings from the study support technology PD to influence the implementation of technology into instructional practices. This may support a new theory regarding technology PD and its influence on the implementation of technology into instructional practices. Specific recommendations for future research include broadening the scope of the current study to determine why teacher use of technology in instructional practices was low prior to the PD provided by the OETT grant.

Summary

The final section of this study on increasing collaboration, shared values, and authentic teaching practices through technological professional development has addressed project strengths and limitations. One project strength was that administrators can use the study to examine the effectiveness of the PD in influencing teachers' shared values, collaboration, and instructional practices regarding instructional technology. Another project strength was it gives all teachers in the school examples of how various teachers have implemented technology into their instructional strategies because of the technology PD. The limitations included the self-reported data collected from the TPACK survey, the study was built with the PD provided by the OETT grant in mind, and the sample size. I used triangulation methods to increase the study's credibility. My personal reflections on scholarship, project development, and leadership and change have

outlined the learning experience I gained as well as my growth. The program evaluation of the effectiveness of the PD provided by the OETT grant at FVMS provided a foundation for social change. Based on this project study, facilitators from the K20 Center can replicate this study to evaluate the effectiveness of the PD provided by the OETT grant for all schools who are recipients of the OETT grant. Administrators at FVMS, as well as administrators in other districts, can use the evaluation report to communicate findings and make recommendations for future technology PD.

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Appendix A: Evaluation Report

Section 1: Introduction

This evaluation report includes the following sections: introduction, background, methodology, results, conclusions and recommendations, and summary. The outcome-based program evaluation of the implementation of teacher collaboration, shared values, and authentic teaching practices and the influence PD had on teachers' implementation of instructional strategies provides summative feedback for the administrators at FVMS. The doctoral project study team involved in the program evaluation included the EdD Doctoral Candidate at Walden University, Committee Chairperson at Walden University, Second Committee Member at Walden University, and University Research Reviewer at Walden University.

The Oklahoma Educational Technology Trust (OETT) grant is provided by the K20 Center and offers technology as well as professional development (PD) to schools within the state of Oklahoma. This grant provided $40,000 for instructional technology and an additional $25,000 (valued) in PD for teachers and administrators. The purpose of this funding source was to provide a network based on collaborative research and outreach to create and sustain innovation and transformation efforts through leadership, shared learning opportunities, and technology integration (K20 Practices of High Achieving Schools, 2016). FVMS needed additional technology in order to have a 1:1 ratio of students to technology devices and PD to teach teachers how to utilize technology and tools. To meet this need, FVMS applied for and received an OETT grant. Prior to receiving this grant, 60% of teachers at FVMS were utilizing little to no technology in

their teaching practices. This grant provided both technology and PD instruction on the use of the technology and tools. The evaluation of how the technological PD provided by the OETT grant influenced teachers' shared values, collaboration and instructional practices regarding instructional technology stemmed from a lack of technology within this district and a lack of knowledge pertaining to the use of the technology in the curriculum.

A program evaluation was used to determine whether training was successful for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. The program evaluation helped determine what influence PD had on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools. To accomplish this program evaluation, I gathered both qualitative and quantitative data.

This evaluation report is intended to provide summative feedback to school administrators regarding how the technological PD provided by the OETT grant influenced teachers' shared values regarding instructional technology, and their collaboration and instructional practices using instructional technology. Based on the findings of this program evaluation, administrators at FVMS will have an awareness of whether training was successful for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. Administrators will have also an awareness of what influence PD had on

teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools.

Section 2: Background

The OETT was established to provide a network based on collaborative research and outreach to create and sustain innovation and transformation efforts through leadership, shared learning opportunities, and technology integration (K20 Practices of High Achieving Schools, 2016). In response to the lack of technology within this district and a lack of knowledge pertaining to the use of the technology in the curriculum, FVMS applied for, and received, an OETT grant. The OETT grant required schools develop a collaborative proposal for implementing three of the ten identified practices evident in high achieving schools (K20 Practices of High Achieving Schools, 2016). The three practices selected by the local school were increased teacher collaboration, shared values, and authentic teaching practices. The goal of the OETT grant, specific to FVMS, was to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. Specific goals listed on the Oklahoma OETT grant application included: to acquire technology resources for hands-on, mobile learning by students to increase academic achievement; to provide PD on research-based strategies to increase student academic achievement through technology-integrated authentic instruction; to further develop professional learning communities; and to use technology and Web 2.0 tools and resources in authentic ways incorporated into the curricula of the school.

At FVMS, the previous ratio for student to technology devices was 2:1. Many students do not have the ability to utilize technology outside of the classroom. FVMS needed additional technology to have a 1:1 ratio of students to technology devices. PD was needed to teach teachers how to utilize technology and tools. Prior to receiving this grant, 60% of teachers at FVMS were utilizing little to no technology in their teaching practices. The instructional technology portion of this grant addressed the need of technology. The PD portion of this grant addressed the need for knowledge of technology in instruction.

Section 3: Methodology

Purpose of the Evaluation

Program evaluation involves studying how a program operates and the outcomes in order to render a judgment about its effectiveness (Patton, 2015). This outcome-based evaluation research supported instructional practices at the local site by identifying themes associated with technology in instruction. The program evaluation examined whether the new technologies PD efforts increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices.

No publicly reported evidence existed with regard to the program's implementation at FVMS. The purpose for conducting a program evaluation at FVMS was to investigate how the PD influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. The rationale for selecting this problem was teachers' lack of knowledge in using technology. As a result of teachers not

using the technology in their instruction, students were not exposed to the use of technology.

Evaluation Design

The evaluation design I chose was an outcome-based program evaluation to investigate how the PD influenced teachers' shared values regarding instructional technology, and their collaboration and instructional practices using instructional technology. A program evaluation using a mixed-methods approach was needed to allow for qualitative and quantitative data collection. A quantitative approach yielded data from the use of the Likert-style survey. However, a qualitative component was also needed to allow for additional insight and clarification to supplement the data gained from the survey.

Through the research questions that I developed for this study, I investigated how the PD influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology.

Research Questions

In alignment with the framework for this study based on Mishra and Koehler's (2006) TPACK theory and Guskey's (2002) five levels of PD evaluation, I attempted to investigate how the PD influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. I developed the following research questions to guide my study:

Research Question 1: How do teachers demonstrate collaboration using instructional technology because of their professional development?

Research Question 2: What shared values have teachers adopted regarding instructional technology because of their professional development?

Research Question 3: How have the authentic teaching practices of participants changed because of the technology professional development as identified by the principles of TPACK?

I designed Research Questions 1 and 2 to be answered through data gathered during one-on-one interviews and classroom observations. I designed Research Question 3 to be answered through data collected from the self-administered survey.

Data Collection Instruments Used

I used extensive data collection techniques to acquire insight into the phenomenon (as cited in Creswell, 2012). Strategies for collecting data included a Likert-type survey, interviews, and observations. I used a Likert-type survey to gain insight and input in the evaluation of how the technological PD provided by the OETT grant influenced teachers' shared values, collaboration and instructional practices regarding instructional technology. The survey was made available to all twenty teachers in this school. Eighteen surveys were completed and returned. An existing survey was utilized and revised as needed to ensure validity of the items used. I used a Likert scale survey to evaluate how the technological PD provided by the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices.

Six interviews, approximately 60- minutes in length, were conducted to provide results to RQ 2. Two teachers from each grade level were selected for interview. My

rationale for using this research design was the evaluation was used to explain the events, activities, actions, and interactions involved in an established educational program that are occurring over an extended period of time (Creswell, 2012). I used interviews to collect data for the qualitative component because interviews allowed for additional, in-depth insight from the participants through general, open-ended questions (Creswell, 2012). This was relevant to the current evaluation because in the current evaluation, a self-administered survey and face-to-face interviews were used.

Six classroom observations were conducted to provide results to RQ 1. The six teachers, two from each grade level, selected for the interview were asked to be available for a 45- minute classroom observation. I used the classroom observations to observe the teachers' use of the new tools which were presented in the PD training. The observations were necessary to allow me to see how the teachers are using the new tools in their classrooms. The teachers' use of the tools and their comfort level using such tools helped me determine the effectiveness of the PD and whether training was successful for the implementation of the instructional strategies specified in the OETT grant proposal, specifically the three practices of teacher collaboration, shared values, and authentic teaching practices. I used an Observation Walk Through Field Notes template I created.

Data Collection Procedures

A program evaluation using a mixed methods research design was used for this study. This type of evaluation was appropriate because I was trying to determine if the new technologies and PD efforts implemented via OETT grant money influenced teachers' shared values, collaboration, and instructional practices using instructional

technology. A program evaluation using a mixed-methods approach was needed to allow for qualitative and quantitative data collection. A quantitative approach yielded data from the use of the Likert-style survey. However, a qualitative component was also needed to allow for additional insight and clarification to supplement the data gained from the survey. Creswell (2007) says that a case study should be used when a researcher desires in-depth knowledge of a bounded system based.

The strategy for data collection was sequential. Data collection for this study took place through a self-administered survey, six one-on-one interviews, and six classroom observations. Six interviews and six classroom observations were conducted to provide results to RQ 1 and RQ 2. Two teachers from each grade level (for a total of six teachers interviewed) were selected. My rationale for using this research design was the evaluation was used to explain the events, activities, actions, and interactions involved in an established educational program that are occurring over an extended period of time (Creswell, 2012). Purposeful sampling was used to select participants to get participants from various subject areas. Purposeful sampling was appropriate for this study because it allowed for the intentional selection of individuals who met criteria to allow me to obtain a deep understanding of the phenomena (Creswell, 2012). To ensure accuracy when transcribing the interview, an audio recording device was used. A data recording protocol was used to record the data. The interviews were used to discuss the results of the survey and provided clarification and additional insight to supplement the data acquired from the survey. The six teachers selected for interview were asked to be available for a 45-minute

classroom observation. The classroom observations were used to observe the teachers' use of the new tools which were presented in the PD training.

The surveys were distributed to 20 teachers first. Approximately two weeks later, the interviews and observations were scheduled for approximately two weeks after the surveys had been returned to me. The interviews occurred on two school days. After the interviews were complete, the observations occurred on two additional school days. The forms of data collection included a Likert-style survey, interviews, and classroom observations. Including qualitative research with the quantitative allowed for an increased understanding of how the tools learned in PD training are utilized in the classroom. Enhancing quantitative data with the qualitative allowed for a deeper understanding of all the factors that play in the situation. The integration of the qualitative and quantitative approaches occurred when the data from the surveys, interviews, and observations were collected and analyzed.

Qualitative Sequence

Interviews. I developed interview questions to explore novice and veteran teachers' views on how the PD influenced technology use in their instructional teaching practices. The follow-up questions also provided additional explanation or clarification of the participants' answers to me when needed. The interviews were recorded on my iPhone and then transferred to an external hard drive, which I placed in a locked filing cabinet until the interviews could be transcribed. Once the interviews were transcribed, each participant was given the opportunity to review the transcript of the interview. Six interviews, approximately 60- minutes in length, were conducted to provide results to RQ

2. Two teachers from each grade level were selected for interview. The rationale for using this research design was the evaluation was used to explain the events, activities, actions, and interactions involved in an established educational program that are occurring over an extended period of time (Creswell, 2012). Interviews were used to collect data for the qualitative component because interviews allowed for additional, in-depth insight from the participants through general, open-ended questions (Creswell, 2012). This was relevant to the current evaluation because in the current evaluation, a self-administered survey and face-to-face interviews was utilized. A member check was used to ensure the accuracy of the information gained (Creswell, 2012). By using a program evaluation, the most accurate information was obtained to evaluate how the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices.

Classroom observations. Once the classroom observations were completed, I coded the data collected from participant interviews and classroom observations, and seven themes emerged. Six classroom observations were conducted to provide results to RQ 1. The six teachers, two from each grade level, selected for the interview were asked to be available for a 45- minute classroom observation. The classroom observations were used to observe the teachers' use of the new tools which were presented in the PD training. The observations allowed me to see how the teachers are using the new tools in their classrooms. The teachers' use of the tools and their comfort level using such tools helped me determine the effectiveness of the PD and whether training was successful for

the implementation of the instructional strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. I used an Observation Walk Through Field Notes template I created. Once the interviews were completed, I observed participants teaching a lesson in their classroom. The lessons varied based on the subject being taught. Observations were one class period (45 minutes) in length. The data from these observations was recorded on an observation protocol form I developed. The observation protocol forms were placed in a folder which was kept on my person until I left the school, transported them to my home, and placed them in a locked filing cabinet until the data could be analyzed. Through the research questions I developed for this study, I evaluated whether the PD influenced teachers' shared values, collaboration and instructional practices regarding instructional technology. Through the research questions that I developed for this study, I investigated how the PD influenced teachers' shared values regarding instructional technology, and their collaboration and instructional practices using instructional technology.

Quantitative Sequence

I used the TPACK survey to collect data for the quantitative component of the research. A survey was the most appropriate method in which to evaluate the effect of the technological professional development provided by the OETT grant and the increase of teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. I used the Likert-type survey to determine how the PD influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. I rated the

responses on a scale based on the participant's agreement with each statement, from Strongly Disagree to Strongly Agree for each question. I used the data to measure how the authentic teaching practices of participants changed because of the technology PD as identified by the TPACK survey.

The survey was made available to 20 teachers in this school. The survey was given to the teachers after a faculty meeting at the school. I was responsible for seeing that all teachers received the survey. Participants returned the surveys to me in person. A list containing the names of all teachers in the school was provided by the principal. The list was used to ensure each teacher received a copy of the survey. Participation in the study was completely voluntary, and participants were allowed to elect to not participate at any time. Eighteen surveys were completed and returned. The TPACK survey (Schmidt et al., 2009) was utilized and revised as needed to ensure validity of the items used.

I used a Likert-type survey to determine how the PD influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. The interviews were used to determine the relationship between teacher collaboration, shared values, and the use of instructional strategies incorporating technology in the classroom. I used the observation tool to determine the use of instructional strategies incorporating technology through increased authentic teaching in the classroom. Through each of the three tools, I gained insight for use in the evaluation of the effectiveness of the PD in providing technology professional development to enhance teacher collaboration, shared values, and authentic teaching.

Section 4: Results

Setting and Sample

Participants selected for this study, by purposeful sampling, included teachers and administrators at a small rural school district in Oklahoma. Criteria for participants to be included in this proposed study include: (a) Participants must be 18 years or older, and (b) participants must be a certified teacher at FVMS. 25 teachers of students at the 6 to 8 grade level at a public school in a southern state were invited to participate in this study. All teachers were given the opportunity to complete the self-assessed survey. Six interviews were conducted for the qualitative portion of this evaluation.

Purposeful sampling was used to select participants from various subject areas. This type of sampling was best because it allowed for the inclusion of a variety of types of participants to be included, but it did not dictate how many or in what proportion the types appear in the population (Bogdan & Biklen, 2007). Two teachers from each grade level were selected for interview. The six teachers selected for interview were also asked to be available for a 45- minute classroom observation. I assured all participants of the voluntary nature of the study and that their responses would be kept confidential. All identifying information was kept separate from data. Data was kept password protected and secure, and only I had access to participants' information as it relates to the data. My rationale for using this research design was that the evaluation will be used to explain the events, activities, actions, and interactions involved in an established educational program that are occurring over an extended period of time (Creswell, 2012).

Data Analysis

The data gained from the interviews and classroom observations was analyzed to identify emerging themes that led to the evaluation of whether the technological PD provided by the OETT grant increased teachers' abilities to implement instructional strategies using technology in the classroom through teacher collaboration, shared values, and authentic teaching practices. I analyzed the data while looking for themes that emerged. . One of the goals of the coding process was to search for recurring categories. Seven themes emerged from this data.

Descriptive Statistics

I analyzed data gained from the surveys using the SPSS computer program and descriptive statistics. I used a chi-square, consisting of a two by two table, to analyze the survey data. After receiving the completed surveys, I sorted the responses by using a chi-square to organize the data. Survey responses were categorized and sorted as to increase in technology use or no increase in technology use. Educators were divided into two groups: novice teachers and veteran teachers. Novice teachers were defined as teachers with fewer than five years of teaching experience. Veteran teachers were defined as teachers with five or more years of teaching experience. A chi-square was used in the study to determine the proportions of veteran teachers and novice teachers in their views of the effectiveness of the PD in providing technology professional development to enhance teacher collaboration, shared values, and authentic teaching. The chi-square was used to determine the effectiveness of the PD based on the responses to the Likert-type survey. Survey responses were categorized and sorted as to increase in technology use or no increase in technology use, as well as sorting the teachers as to novice or veteran.

Choice of categories stemmed from a desire to determine if experience and use of technology impact the perceived effectiveness of PD. Division into these categories allowed for direction of future PD based on results, should a pattern have been evident between participants in respective categories.

Findings and Themes Identified

The problem pertained to a lack of technology within this district and a lack of knowledge pertaining to the use of the technology in the curriculum. Using a chi-square, interview questions, and an observation protocol, I assessed the research questions for this doctoral project study based on the problem.

Qualitative Findings

Research Question 1. How do teachers demonstrate collaboration using instructional technology because of their professional development? Through one-on-one interviews and classroom observations with six selected participants, I posed questions to elicit responses to evaluate how the PD influenced teachers' collaboration and instructional practices using instructional technology. I asked questions to allow participants the opportunity to express their thoughts and feelings regarding the influence of the PD on teachers' collaboration and instructional practices using instructional technology. Participants were given the opportunity to provide examples of using the strategies provided by the PD in their instructional practices within their classroom. Some examples include (a) participant T3 stated, "students use Kahootit"; (b) participant T17 stated, "students use Flocabulary, Kahootit, IXL, and Study Island"; (c) participant T8

stated, “students look up the design for a lab experiment, follow the schematic drawings, and build the experiment.”

Through the interview process, I asked clarifying questions to identify themes that emerged from participant responses. Seven themes emerged: (a) increase in the level of expertise in using technology within instructional practices, (b) increase in the level of use of technology within the classroom, (c) increase in collaboration among colleagues using technology in instructional practices, (d) increase in shared values among colleagues regarding instructional technology, (e) PD offered several strategies to incorporate the use of technology, (f) increase in authentic teaching practices, and (g) newer technology preferred over older technology. Based on the findings, data showed increases in the level of expertise in using technology within instructional practices and in the level of use of technology within the classroom. Along with these increases was an increase in collaboration among colleagues using technology in instructional practices.

Research Question 2. What shared values have teachers adopted regarding instructional technology because of their professional development? Through one-on-one interviews and classroom observations with six selected participants, I posed questions to elicit responses to evaluate how the PD influenced teachers’ shared values regarding instructional technology. Similar to that of Research Question 1, I asked questions to allow participants the opportunity to express their thoughts and feelings regarding the influence of the PD on teachers’ shared values regarding instructional technology. Participants were given the opportunity to provide examples of using the strategies provided by the PD in their instructional practices within their classroom. Some examples

include (a) participant T5 stated, “students used We Video to create movie trailers for the novel *The Outsiders*”; (b) participant T16 stated, “I used the Google Arts portal to walk through famous museums with my class”; (c) participant T18 stated, “My students do a research project in which they research a European Medieval castle. Student search Google, evaluate websites find information on their castle, and create a report on their castle. The group leader posts the report to Google Classroom.” Through the interview process, I asked clarifying questions to identify themes that emerged from participant responses. Based on the findings, similar to those of Research Question 1, data showed increases in the level of expertise in using technology within instructional practices and in the level of use of technology within the classroom. Along with these increases was an increase in shared values among colleagues regarding instructional technology. An additional finding of the data was shared values among the students.

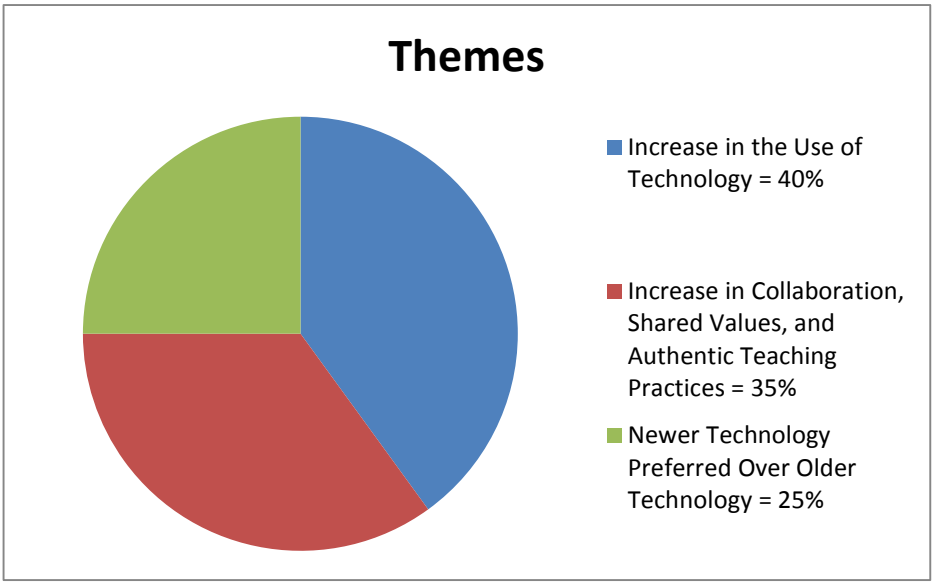

Figure A1. Initial themes from interviews and classroom observations.

In addition to the initial themes, seven themes emerged from the interviews and classroom observations:

1. Increase in the level of expertise in using technology within instructional practices
2. Increase in the level of use of technology within the classroom
3. Increase in collaboration among colleagues using technology in instructional practices
4. Increase in shared values among colleagues regarding instructional technology
5. PD offered several strategies to incorporate the use of technology
6. Increase in authentic teaching practices
7. Newer technology preferred over older technology

Findings for these themes are discussed in the following sections.

Theme 1

The findings from the one-on-one interviews showed that most teachers ranked their level of expertise in using technology within their instructional practices prior to the PD as moderate. T1, T2, T4, and T5 all ranked their level of expertise as moderate. T6 ranked his level of expertise as low, and T3 ranked her level of expertise as high.

Theme 2

The findings from the one-on-one interviews showed that half of the teachers ranked their level of use of technology within their classrooms as moderate as well. T2, T3, T5 ranked their level of use of technology within their classrooms as moderate. T4 and T6 ranked their level of use as low, and T1 ranked her level of use as high.

Theme 3

The findings from the one-one-one interviews showed that multiple teachers saw an increase in collaboration among colleagues after the technology PD. T3 and T5 both stated, "We collaborate with each other in regard to projects that can be tied together for both classes," and, "through these projects, students are able to see what is going on in the world at a specific time in history." T6 "regularly collaborates with math teachers in regard to how mathematics can be applied to topics in class."

Theme 4

The findings from the one-on-one interviews showed an increase in shared values among not only colleagues, but among students as well. T4 stated, "A shared value that has been seen is teachers pushing students harder than what's normally expected." T5 stated, "A shared value that has been seen is students taking more ownership in the lessons when technology is incorporated." T3 stated, "A shared value that has been seen is in the area of decision making and change." T3 further concluded that, "Students realize things are not just about them, but about the class as a whole. This can be applied to teachers as well. As teachers see the positive results from having shared values, teachers realize things are not just about them, but the school, and the learning environment, as a whole."

Theme 5

The findings from the one-one-one interviews showed that as a result of the technology PD teachers were given multiple strategies and tools to incorporate the use of technology into instructional strategies. T1 stated, "Strategies that have been incorporated

since the technology PD include any technology that is available. With the technology grant, the school was able to purchase 87 Samsung Galaxy 4 tablets. However, due to the wear and tear over the years, along with the out-datedness of the tablets, many students in my class elect to use the Chromebooks that were purchased two years after the grant was received." When asked about strategies that have been incorporated into his classroom since the technology PD, T2 stated, "Students use both the tablets and the Chromebooks." T4 stated, "The incorporation of technology into projects and assignments makes the activities more engaging." I also observed this during my classroom observation of his classroom. T3, T5, and T6 provided examples of specific strategies from the technology PD that they have incorporated into their instructional practices: T3 has incorporated strategies such as Three Post-It Notes and What, So What, and Now What; T6 has incorporated the use of Google Maps to locate and study about specific locations, which I observed during his classroom observation; T5 has incorporated many of the Google platform tools into her classroom. She currently uses Google Classroom, Google docs, and Google forms. T5 uses Google forms to create a spreadsheet to see the most missed questions on an assignment.

Theme 6

The findings from the one-one-one interviews showed changes in authentic teaching practices because of the technology PD. Authentic teaching is defined as a multifaceted approach to teaching based on four principles: genuineness, being consistent in values and actions, a relationship with others which encourages them to be authentic, and living a life that is considered critical (Cranton & Carusetta, 2004). T2 stated,

"Access to the internet has increased student level of science knowledge greatly." T1 stated, "Having technology for the students to use has allowed me to utilize information about how the students are learning from the technology to design lessons to improve their learning and interest." T6 stated, "I have incorporated more hands-on and technology lessons." One example of a hands-on, technology lesson that I observed in his classroom was the use of the tablets to research new places. He noted, "Students are used to growing up touching that screen and working that way, as opposed to turning pages." T4 stated, "Due to teaching field and location, I cannot implement some of the things." He also noted, "There is not the technology there to implement it with." T3 stated, "The authentic teaching has helped students in connecting learning to life", and, "I think it helps connect teaching and learning to assignments and projects that students see as having a value beyond the classroom." T5 stated, "Because of the technology PD, I am more willing to go out and find different apps and technology to use in my classroom than I was prior to the technology PD."

Theme 7

The findings from the one-one-one interviews showed that the majority of the participants preferred to use newer technology over older technology. At the time of this study, the tablets were being used for the third year. The school also purchased classroom sets of Chromebooks two years after receiving the technology grant. During a classroom observation in participant T1's classroom, T1 showed the visible wear and tear on many of the tablets. Some tablets were warped due to heat, which was most likely caused due to the need for charging after each use. Many of the tablets also appeared to have liquid

under the screen. The tablets came with wireless keyboards; however, the participant stated that, due to connectivity issues, it was easier for students to use the tablets without the wireless keyboard. During this classroom observation, participant T1 asked her students whether they preferred to work on the tablets or the Chromebooks and why. Students stated, "We prefer to use the Chromebooks because they were easier to type on, easier to log into the internet on, and just easier, faster, to use in general." Due to the popularity of the Chromebooks with the students, T5 stated, "I plan to use my summer to look into apps that are available on the Chromebook." T3 stated, "I would like to see funding targeted only for technology. I feel this would be beneficial to ensure the school doesn't start funding, and I am afraid money will not be available to replace the technology from the grant." All participants agreed that the knowledge gained from the technology PD can be applied not only to the tablets but also to technology that may be received in the future.

Quantitative Findings

Research Question 3. How have the authentic teaching practices of participants changed because of the technology professional development as identified by the principles of TPACK? Through the self-administered TPACK survey, I posed questions intended to elicit responses to evaluate how the PD influenced teachers' authentic teaching practices as identified by the principles of TPACK. Specifically, questions 51-53 asked participants to describe a specific situation where a PD instructor, one of their colleagues, and the participant effectively demonstrated or modeled techniques which combined content, technologies and teaching approaches in a classroom lesson. Through

the use of the Likert-type survey, I evaluated participants' use of technology in their instructional practices. Specifically, questions 43-46 asked participants to rate their ability to combine technologies and teaching approaches with core subject areas. I used a chi-square to illustrate the survey results. My analysis assessed the presence of an association between veteran and novice teachers and their use of technology in instructional practices after the OETT professional development. Based on the findings of the data, 14 participants were categorized as veteran and four participants were categorized as novice. All participants showed an increase in technology use in their instructional practices because of the technology PD.

I used descriptive statistics to illustrate the quantitative findings of this study. When researchers are working with categorical variables, it is important that they determine and report the mode of the variables (Creswell, 2012). Slightly more than three-fourths of the participants in the sample were considered veteran teachers. In Table A1, the categorical variable is years of experience affiliation. In this table, I have illustrated the frequency of each group, as well as the percent and valid percent. The percent and valid percent for each group are equivalent because no data was missing which would have needed to be excluded from the calculations.

Table A1

Descriptive Statistics for Teachers' Years of Experience Affiliation

	Frequency	Percent	Valid Percent
Novice	4	22.2	22.2
Veteran	14	77.8	77.8
Total	18	100.0	100.0

In the categorical variable technology use after the OETT professional development, 18 exhibited an increase in technology. The percent and valid percent for each group are equivalent because no data was missing which would have needed to be excluded from the calculations.

Summary of Outcomes

The study addressed the problem of whether the training was successful for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. It is also unknown what influence PD had on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools. The outcomes connected to the analysis of all three data sources supported this study's problem and research questions. I developed the research questions to meet the need for a program evaluation to determine how the PD influenced teachers' shared values, collaboration, instructional practices regarding instructional technology. Common themes among participants' interview responses and classroom observation data were identified. The findings of the data from the survey, interview responses, and classroom observations conclude the PD had a positive influence on teachers' shared values, collaboration, and instructional practices regarding instructional technology.

Strengths and Limitations Shown in Results

Strengths

Program evaluation involves examining a program and its results to determine its effectiveness (Patton, 2015). PD needs to be evaluated to determine its effectiveness

(Guskey, 2002). The first strength of this project is that administrators can use it to examine the effectiveness of the PD in influencing teachers' shared values, collaboration, and instructional practices regarding instructional technology. In creating the project, I considered the technology available, both before and after receiving the grant, to potentially be implemented in instructional strategies. I formulated the project using the data collected during the study.

The data collected and analyzed from the TPACK survey were based on a 53 question survey designed to survey pre-service teachers' knowledge of teaching and technology. I modified the survey for use with current teachers rather than pre-service teachers. Data collected and analyzed from the one-on-one interviews were based on 10 open-ended questions. This allowed me to identify the influence technology PD had on teachers' shared values regarding instructional technology, and their collaboration and instructional practices using instructional technology. The data collected and analyzed from the classroom observations were recorded on an observation protocol during a 45-minute visit to the classroom. The evaluation report helped outline the findings and recommendations for future decision-making.

An additional strength of the project is that it gives the teachers in the school examples of how various teachers have implemented technology in their instructional strategies because of the technology PD. Often there is not enough time for teachers to visit other classrooms to get additional ideas on how to implement the technology. The evaluation report contains examples of ways the technology is being implemented. A

final strength of this project is that other districts may be able to adapt it to provide PD in implementing technology into instructional strategies for their teachers.

Limitations

Limitations existed as I developed the evaluation report. The first limitation pertained to the self-reported data collected from the TPACK survey, which was similar to limitations found by Gebre et al. (2015) and the use of self-reported data. A second limitation of this study was it was built with the PD provided by the OETT grant in mind. It is possible that other districts will have different technology PD. If a district is not a recipient of the OETT grant, the evaluation report created for this study would be less beneficial to that district. Another limitation of this study is that the research was only conducted at one school that was a recipient of the OETT grant, preventing comparison of findings with other schools that have received the technology PD as part of the OETT grant. A final limitation of this study was the sample size. Although all but two teachers at the study school elected to participate in the study, the sample size for this study was 18 participants.

Section 5: Conclusions and Recommendations

The outcome-based evaluation conducted as part of the development of the evaluation report was important because it helped to determine the level of effectiveness of the training for the implementation of the three strategies specified in the OETT grant proposal: teacher collaboration, shared values, and authentic teaching practices. I also wanted to determine what influence PD had on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected

practices of high achieving schools. This study will contribute to the growing body of research on the topic of technology PD. The findings of my program evaluation indicated that technology PD increased the implementation of teacher collaboration, shared values, and authentic teaching practices. The technology PD also had a positive influence on teachers' implementation of instructional strategies effectively while incorporating technology with three of the 10 selected practices of high achieving schools. Participants expressed they have not had the opportunity to observe colleagues' implementation of technology into instructional practices. To address this issue, I made recommendations to the study site to continue technology PD and allow teachers time to observe colleagues' implementation of technology into instructional practices. The potential influence on social change will be driven by the partnership between teachers, administrators, and staff to continue the increase in technology implementation into instructional practices and technology PD at the local, state, and national levels.

Section 6: Summary

The information provided in this evaluation report may contribute to positive social change by leading to the implementation of authentic teaching practices that include collaboration and shared values in an authentic learning environment as a result of PD focused on implementing instructional strategies incorporating technology. On the local level, this evaluation report may contribute to positive social change by identifying ways the OETT grant supported instruction using technology. Social change can occur when administrators provide PD to teachers focused on implementation of authentic teaching practices that include collaboration and shared values in an authentic learning

environment. The potential findings may lead to positive social change by identifying ways that the technological PD provided by the OETT grant influenced teachers' shared values, collaboration, and instructional practices regarding instructional technology. Social changes that may occur due to the findings of this study include the school gaining a better understanding of the influence of technology in instruction on student learning and identifying tools that potentially increased teacher uses of the technologies purchased with the grant monies as well as teacher application of the knowledge gained in the PD provided through the grant. It was important to identify tools for successful teacher implementation of technology in instruction. Students potentially benefitted from the social change by having access to current and dependable technology in instruction.

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Appendix B: TPACK Survey

Survey of Preservice Teachers' Knowledge of Teaching and Technology

Denise A. Schmidt, Evrim Baran, and Ann D. Thompson Center for Technology in Learning and Teaching

Iowa State University

Matthew J. Koehler, Punya Mishra, and Tae Shin Michigan State University

Version 1.1: (updated September 1, 2009). This survey was revised to reflect research results obtained from its administration during the 2008-2009 and 2009-2010 academic years. This document provides the latest version of the survey and reports the reliability scores for each TPACK domain. (This document will be updated as the survey is further developed).

The following papers and presentations highlight the development process of this survey:

Schmidt, D. A., Baran, E., Thompson A. D., Koehler, M. J., Mishra, P. & Shin, T. (2009-10). Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers. Journal of Research on Technology in Education, 42(2), 123-149.

Schmidt, D. A., Baran, E., Thompson A. D., Koehler, M. J., Mishra, P. & Shin, T. (2009). The Continuing Development, Validation and Implementation of a TPACK Assessment Instrument for Preservice Teachers. Paper submitted to the 2010 Annual Meeting of the American Educational Research Association. April 30-May 4, Denver, CO.

Schmidt, D., Baran, E., Thompson, A., Koehler, M.J., Shin, T, & Mishra, P. (2009, April). Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice

Teachers. Paper presented at the 2009 Annual Meeting of the American Educational Research Association. April 13-17,San Diego, CA.

Schmidt, D., Baran, E., Thompson, A., Koehler, M.J., Mishra, P., & Shin, T. (2009, March). Examining preservice teachers' development of technological pedagogical content knowledge in an introductory instructional technology course. Paper presented at the 2009 International Conference of the Society for the Information and Technology & Teacher Education. March 2-6, Charleston, SC.

Shin, T., Koehler, M.J., Mishra, P. Schmidt, D., Baran, E., & Thompson, A.,(2009, March). Changing technological pedagogical content knowledge (TPACK) through course experiences. Paper presented at the 2009 International Conference of the Society for the Information and Technology & Teacher Education. March 2-6, Charleston, SC.

How do I use the survey? The questions you want are most likely questions 1-46 starting under the header "TK (Technology Knowledge)". In the papers cited above, these categories were removed so that participants were not oriented to the constructs when answering the survey questions. The items were presented in order from 1 through 46, however. The other items are more particular to individual study and teacher education context to better understand results found on questions 1-46. You are free to use them, or modify them. However, they are not the core items used to measure the components of TPACK.

How do score the survey. Each item response is scored with a value of 1 assigned to strongly disagree, all the way to 5 for strongly agree. For each construct the participant's responses are averaged. For example, the 6 questions under TK (Technology Knowledge) are averaged to produce one TK (Technology Knowledge) Score.

Reliability Scores from Schmidt et al. (2009)

TPACK Domain	Internal consistency (alpha)
Technology knowledge (TK)	.86
Content knowledge (CK)	
Social studies	.82
Mathematics	.83
Science	.78
Literature	.83
Pedagogical knowledge (PK)	.87
Pedagogical content knowledge (PCK)	.87
Technological pedagogical knowledge (TPK)	.93
Technological content knowledge (TCK)	.86
Technological pedagogical content knowledge (TPACK)	.89

Thank you for taking time to complete this questionnaire. Please answer each question to the best of your knowledge. Your thoughtfulness and candid responses will be greatly appreciated. Your individual name or identification number will not at any time be associated with your responses. Your responses will be kept completely confidential and will not influence your course grade.

DEMOGRAPHIC INFORMATION

1. Your e-mail address
2. Gender
   a. Female
   b. Male
3. Age range
   a. 20-29
   b. 30-39
   c. 40-49
   d. 50+
4. Years Teaching Experience
   a. less than 5 years
   b. 5+ years
5. Subject(s) Taught
   a. Art
   b. Early Childhood Education Unified with Special Education
   c. English and Language Arts
   d. Foreign Language
   e. Health
   f. History
   g. Instructional Strategist: Mild/Moderate (K8) Endorsement
   h. Mathematics
   i. Music
   j. Science-Basic
   k. Social Studies
   l. Speech/Theater
   m. Other:_____(please explain)

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc. Please answer all of the questions and if you are uncertain of or neutral about your response you may always select "Neither Agree or Disagree"

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Technology knowledge (TK)					
1. I know how to solve my own technical problems. 2. I can learn technology easily. 3. I keep up with important new technologies. 4. I frequently play around the technology. 5. I know about a lot of different technologies. 6. I have the technical skills I need to use technology.					
Content knowledge (CK)					
Mathematics					
7. I have sufficient knowledge about mathematics. 8. I can use a mathematical way of thinking. 9. I have various ways and strategies of developing my understanding of mathematics.					
Social studies					
10. I have sufficient knowledge about social studies. 11. I can use a historical way of thinking. 12. I have various ways and strategies of developing my understanding of social studies.					
Science					
13. I have sufficient knowledge about science. 14. I can use a scientific way of thinking.					

15. I have various ways and strategies of developing my understanding of science.
Literacy
16. I have sufficient knowledge about literacy.
17. I can use a literary way of thinking.
18. I have various ways and strategies of developing my understanding of literacy.
Pedagogical knowledge
19. I know how to assess student performance in a classroom.
20. I can adapt my teaching based-upon what students currently understand or do not understand.
21. I can adapt my teaching style to different learners.
22. I can assess student learning in multiple ways.
23. I can use a wide range of teaching approaches in a classroom setting.
24. I am familiar with common student understandings and misconceptions.
25. I know how to organize and maintain classroom management.
Pedagogical content knowledge
26. I can select effective teaching approaches to guide student thinking and learning in mathematics.
27. I can select effective teaching approaches to guide student thinking and learning in literacy.
28. I can select effective teaching approaches to guide student thinking and learning in science.
29. I can select effective teaching approaches to guide student thinking and learning in social studies.
Technological content knowledge
30. I know about technologies that I can use for understanding and doing mathematics.
31. I know about technologies that I can use for understanding and doing literacy.
32. I know about technologies that I can use for understanding and doing science.
33. I know about technologies that I can use for understanding and doing social

studies.

Technological pedagogical knowledge
34. I can choose technologies that enhance the teaching approaches for a lesson.
35. I can choose technologies that enhance students' learning for a lesson.
36. My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.
37. I am thinking critically about how to use technology in my classroom.
38. I can adapt the use of the technologies that I am learning about to different teaching activities.
39. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.
40. I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom.
41. I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district.
42. I can choose technologies that enhance the content for a lesson.
Technology pedagogy and content knowledge (TPACK)
43. I can teach lessons that appropriately combine mathematics, technologies and teaching approaches.
44. I can teach lessons that appropriately combine literacy, technologies and teaching approaches.
45. I can teach lessons that appropriately combine science, technologies and teaching approaches.
46. I can teach lessons that appropriately combine social studies, technologies and teaching approaches.
Models of TPACK (Faculty, Grades 6-8 teachers)
47. The professional development instructors
48. My Grades 6-8 colleagues appropriately model combining content, technologies and teaching approaches in

their teaching.

Models of TPACK	25% or less	26% - 50%	51% - 75%	76%-100%	25% or less
49. In general, approximately what percentage of professional development instructors have provided an effective model of combining content, technologies and teaching approaches in their teaching?					
50. In general, approximately what percentage of the grade 6-8 colleagues have provided an effective model of combining content, technologies and teaching approaches in their teaching?					

Please complete this section by writing your responses in the space provided.

51. Describe a specific episode where a professional development instructor effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented.

52. Describe a specific episode where one of your grades 6-8 colleagues effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented. If you have not observed a teacher modeling this, please indicate that you have not.

53. Describe a specific episode where you effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content you taught, what technology you used, and what teaching approach(es) you implemented. If you have not had the opportunity to teach a lesson, please indicate that you have not.

Permission to Use

Reply all

Today, 5:53 PM

Jennifer L. Blackford

Flag for follow up. Completed on Wednesday, August 16, 2017.

Hi Jennifer,

Thank you for your interest in our TPACK survey. We give you our permission to use it for your study. Sounds interesting – good luck!

Best,
Denise

Denise A. Schmidt-Crawford
Director and Associate Professor
Center for Technology in Learning and Teaching
School of Education
Iowa State University

Appendix C: Interview Questions

1. What is your name?
2. What grade level(s) and subject(s) do you teach?
3. Prior to the Professional Development (PD) provided by the OETT grant, how would you rate your level of expertise in using technology within your instructional practices?
4. Prior to the PD provided by the OETT grant, how would you rate the level of use of technology within your classroom?
5. In what ways did you find the PD beneficial in increasing your level of expertise in using technology within your instructional practices?
6. What strategies offered by the PD have you incorporated most in your use of technology within your instructional practices?
7. How do you demonstrate collaboration using instructional technology because of the technology PD?
8. What shared values have you adopted regarding instructional technology because of the technology PD?
9. Have your authentic teaching practices changed because of the technology PD?
10. Is there anything else that you feel would be beneficial to this study that you would like to share?

Appendix D: Observation Field Notes Template

Demographic Information:

School:	Teacher:
Date:	Time:
Content Area	Number of Students:

Students working:
(Check all that apply)

Individually:	In Pairs:	In Small Groups:	Whole Class:

Is technology being used for instructional purposes during the observation period?

Yes:	No:

Was this technology shared/ taught in the professional development sessions provided by the OETT grant?

Yes:	No:	Technology not observed:

Technology in use:
(Check all that apply)

Technology in use by Teacher (Check all that apply)	Technology in use by Student (Check all that apply)
Laptop:	Laptop:
Smartboard:	Smartboard:
Clickers:	Clickers:
Projector:	Projector:

Cell phone:	Cell phone:
Tablet:	Tablet:
Desktop PC:	Desktop PC:
Other:	Other:

Software/ Supports in Use:
(Check all that apply)

Internet search:
Spreadsheet/ data analysis software:
Word Processing software:
Presentation software:
Digital Textbook:
NoteShare, Google Docs, etc:
Web 2.0 Apps:
Other:

Is technology used in isolation by students?
(No textbooks or worksheets)

Yes:	No:

Is technology used in isolation by the teacher?
(Presentation)

Yes:	No:

What materials or supports were used in conjunction with technology?

Bloom's Level:

What does the lesson target on Bloom's Scale?

Remember/ Understand:
Apply:
Analyze/Evaluate:
Create:
Unable to evaluate:

Brief description of lesson and technology use:

Comments and additional notes:

Student Engagement:

Appendix E: Research Question 1 Open Coding Code and Interview Transcript Excerpts

Theme	Transcript excerpts
Increase in the level of expertise in using technology within instructional practices	T1: I would rate the level of expertise using technology in my classroom prior to the OETT grant by using numbers probably a 5 out of 10. My school received Samsung tablets through the grant, so the professional development instructors and our computer tech taught me the ins and out of the tablet because I am not all that computer literate. T2: Right in the middle. I was comfortable with some technology, but not aware of some of the newer technologies available. T3: Very good with what I had. I tried to stay on top of all the changes made in technology although sometimes difficult because technology changes every day. The professional development presenter introduced how to be better collaborators with the faculty and staff and stressed the importance of authentic teaching. T4: Moderate. The professional development presenter introduced new ways to get research. T5: On a scale of 1 to 10, I would think that I was about a 6 or a 7. I was introduced to the Google platform: Google Classroom, Google docs, Google forms. T6: Prior to the professional development, I would say my level was basic. The professional development provided me with ideas to use with my students.
Increase in the level of use of technology within the classroom	T1: I would rate the level of expertise using technology in my classroom prior to the OETT grant by using numbers probably a 5 out of 10. My school received Samsung tablets through the grant, so the professional development instructors and our computer tech taught me the ins and out of the tablet because I am not all that computer literate. T2: Right in the middle. I was comfortable with some technology, but not aware of some of the newer technologies available. T3: Very good with what I had. I tried to stay on top of all the changes made in technology although sometimes difficult because technology changes every day. The professional development presenter introduced how to be better collaborators with the faculty and staff and stressed the importance of authentic teaching. T4: Moderate. The professional development presenter introduced new ways to get research. T5: On a scale of 1 to 10, I would think that I was about a 6 or a 7. I was introduced to the Google platform: Google Classroom, Google docs, Google forms. T6: Prior to the professional development, I would say my level was basic. The professional development provided me with ideas to use with my students.

(table continues)

Theme	Transcript excerpts
Increase in collaboration among colleagues using technology in instructional practices	T1: My students work together to teach a lesson. They have to go research, organize, and present the lesson in front of the class. T2: My student work in groups often and collaborate to come up with something that works very well. T3: Using the strategies provided in the professional development, it is real easy to work with teachers. T4: With other teachers, just talking about finding ways to cross how the information goes together. T5: I collaborate with the History teacher to come up with projects. In the past, we have collaborated on assignments and lessons for World War II and the Holocaust and how it ties into *The Diary of Ann Frank*. T6: With math, we can look at latitude/ longitude, to help students find locations.
PD offered several strategies to incorporate the use of technology	T3: The presenter introduced various strategies that could be used with our students such as Three Post-It Notes and What, So What, and Now What. T4: Incorporating the assignments into projects. T5: I was introduced to the Google Platform: Google Classroom, Google docs, and Google forms. T6: Google Maps.
Increase in authentic teaching practices	T1: Since we have technology for the students to use, I can utilize the information about how the students are learning from the technology and design their lessons to improve their learning and interest. T2: Access to the internet has increased student level of science knowledge greatly. T3: I think authentic teaching has helped students in connecting learning to life. T5: I am more willing to go out and find different apps and technology uses to use in my class than I was before. T6: I have incorporated more hands-on and technology lessons.
Newer technology preferred over older technology	T1: The students feel like the Chromebooks are more computer friendly. T3: The Chromebooks work better, especially for any papers written or typed or anything like that.

Appendix F: Research Question 2 Open Coding Code and Interview Transcript Excerpts

Theme	Transcript excerpts
Increase in the level of expertise in using technology within instructional practices	T1: I would rate the level of expertise using technology in my classroom prior to the OETT grant by using numbers probably a 5 out of 10. My school received Samsung tablets through the grant, so the professional development instructors and our computer tech taught me the ins and out of the tablet because I am not all that computer literate. T2: Right in the middle. I was comfortable with some technology, but not aware of some of the newer technologies available. T3: Very good with what I had. I tried to stay on top of all the changes made in technology although sometimes difficult because technology changes every day. The professional development presenter introduced how to be better collaborators with the faculty and staff and stressed the importance of authentic teaching. T4: Moderate. The professional development presenter introduced new ways to get research. T5: On a scale of 1 to 10, I would think that I was about a 6 or a 7. I was introduced to the Google platform: Google Classroom, Google docs, Google forms. T6: Prior to the professional development, I would say my level was basic. The professional development provided me with ideas to use with my students.
Increase in the level of use of technology within the classroom	T1: I would rate the level of expertise using technology in my classroom prior to the OETT grant by using numbers probably a 5 out of 10. My school received Samsung tablets through the grant, so the professional development instructors and our computer tech taught me the ins and out of the tablet because I am not all that computer literate. T2: Right in the middle. I was comfortable with some technology, but not aware of some of the newer technologies available. T3: Very good with what I had. I tried to stay on top of all the changes made in technology although sometimes difficult because technology changes every day. The professional development presenter introduced how to be better collaborators with the faculty and staff and stressed the importance of authentic teaching. T4: Moderate. The professional development presenter introduced new ways to get research. T5: On a scale of 1 to 10, I would think that I was about a 6 or a 7. I was introduced to the Google platform: Google Classroom, Google docs, Google forms. T6: Prior to the professional development, would say my level was basic. The professional development provided me with ideas to use with my students.

(table continues)

Theme	Transcript excerpts
Increase in shared values among colleagues regarding instructional technology	T3: Most of our teachers work together toward a shared vision for student learning. T5: I think that students take more ownership, and they value the authentic lessons when we incorporate the technology.
PD offered several strategies to incorporate the use of technology	T3: The presenter introduced various strategies that could be used with our students such as Three Post-It Notes and What, So What, and Now What. T4: Incorporating the assignments into projects. T5: I was introduced to the Google Platform: Google Classroom, Google docs, and Google forms. T6: Google Maps.
Increase in authentic teaching practices	T1: Since we have technology for the students to use, I can utilize the information about how the students are learning from the technology and design their lessons to improve their learning and interest. T2: Access to the internet has increased student level of science knowledge greatly. T3: I think authentic teaching has helped students in connecting learning to life. T5: I am more willing to go out and find different apps and technology uses to use in my class than I was before. T6: I have incorporated more hands-on and technology lessons.
Newer technology preferred over older technology	T1: The students feel like the Chromebooks are more computer friendly. T3: The Chromebooks work better, especially for any papers written or typed or anything like that.