Using the Oklahoma Educational Technology Trust (OETT) Grant to support technology professional development

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ABSTRACT

It was unknown whether training was successful for the implementation of the instructional strategies specified in the Oklahoma Educational Technology Trust grant proposal at a small rural school district in Oklahoma. The purpose of this outcome-based program evaluation project study was to investigate how professional development (PD) influenced 25 teachers' shared values regarding instructional technology and their collaboration and instructional practices using instructional technology. Guided by Mishra and Koehler's TPACK theory and Guskey's model for PD evaluation, the research questions were designed to determine: (a) how teachers demonstrate collaboration using instructional technology because of PD, (b) what shared values teachers have adopted regarding instructional technology because 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 themes that emerged from data collection for the qualitative portion. The results reflected ways technology is being implemented into instructional strategies. The implication for social change of this research includes support for including collaboration and shared values in professional development for instructional strategies incorporating technology, which can lead to better learning environments.

Keywords: shared collaboration, authentic teaching, shared values, technological education.

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. 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.

DEFINITION OF THE 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.

RESEARCH QUESTIONS

The research 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, Erstad, Dede, & Mishra, 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?

LITERATURE REVIEW

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). This section includes the conceptual framework for the study and the themes that related to the study.

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 (2002) 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.

TPACK lies within the intersection of the three types of knowledge and represents a combination of them (Pringle, Dawson, & Ritzhaupt, 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.

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. 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).

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).

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).

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.

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). 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.

SHARED VALUES OF TEACHERS

The building of shared values is an essential prerequisite in the promotion of collaboration and problem solving (Maich & Hall, 2016). 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 (Andrews & Abawi, 2017). Principals need to select the values based on the needs of the school and what key stakeholders have determined is important (Andrews & Abawi). 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 (Andrews & Abawi, 2017).

TEACHER COLLABORATION

Collaboration between teachers is a vital predictor for successful implementation of digital media in schools and teaching (Andrews & Abawi, 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).

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 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).

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 (Voogt et al., 2013). 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, (Voogt 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. 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). 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).

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 (Bakir, 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 (Andrews & Abawi, 2017). 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 (Andrews & Abawi, 2017). 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 (Andrews & Abawi, 2017). 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).

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 (Maich & Hall, 2016). 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 (Maich & Hall, 2016). 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 (Maich & Hall, 2016). 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 (Bakir, 2016). 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 (Bakir, 2016). 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 allows educators to form collaborative groups specific to certain grade levels and/or subject areas (Bakir, 2016).

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.

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 (Mirzajani et al., 2016). 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 (Mirzajani et al., 2016).

METHODOLOGY

The program evaluation for this study involved a mixed methods research design. The purpose of the research is 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. 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. 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 (Koehler et al., 2013). 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, Zyad (2016) 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, Liscouski (2008) 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 (Creswell, 2014). 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 (Creswell, 2014). 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.

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 COLLECTION

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 two weeks later, the interviews and observations were scheduled for approximately two 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 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 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).

DATA ANALYSIS

Data analysis resulted from the surveys using the SPSS computer program and descriptive statistics. After receiving the completed surveys, responses were sorted 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. A chi-square was used 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. The chi-square was used to determine the effectiveness of the PD based on the responses to the Likert-type survey. Categories were chosen 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. The data analysis gained from the interviews and classroom observations were used 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.

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, questions elicited responses to evaluate how the PD influenced teachers' collaboration and instructional practices using instructional technology. Participants were given 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, clarifying questions were asked 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, questions were intended to elicit responses to evaluate how the PD influenced teachers' shared values regarding instructional technology. Questions allowed 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, clarifying questions were asked 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 (see Figure 2).

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 (Bakir, 2016). 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.

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, questions were 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, an evaluation of participants' use of technology in their instructional practices was conducted. 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.

Descriptive statistics were used 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, 2014). 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. 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. For the categorical variable of technology use after the OETT PD, 18 exhibited an increase in technology use. 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.

LIMITATIONS

Limitations existed in 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.

RECOMMENDED FOR ALTERNATIVE APPROACHES

The purpose of the study was to determine 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. Data was collected by first administering the TPACK survey, followed by participant interviews and classroom observations. It is recommended to complete 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, 2014). 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.

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APPENDIX A

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+

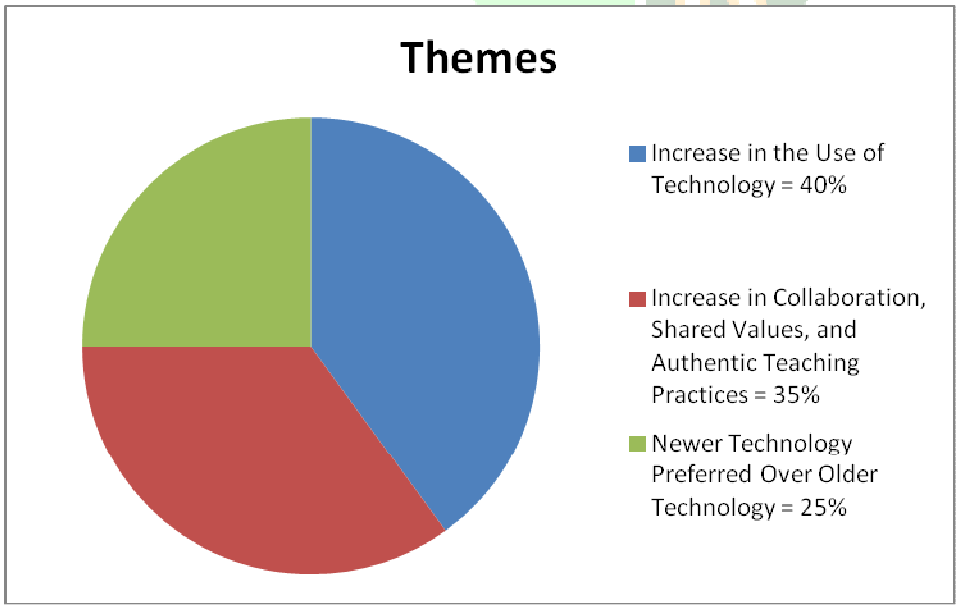

Figure 1. Initial themes from interviews and classroom observations.

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