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Vocational High School Teachers' Perceptions of Technology Integration at Their School

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This is to certify that the doctoral study by

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the review committee have been made.

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Abstract

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Ed.S Walden University 2012

MA, St. Peter's University 2005

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Proposal Submitted in Partial Fulfillment

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Abstract

In a suburban vocational high school in the northeastern United States, teachers revealed that professional development training in technology was not equipping teachers with the skills nor was it giving them the support needed to implement technology in their instructional practices. The purpose of this qualitative project study was to explore vocational high school teachers' perceptions about participating in professional development that relate to technology integration in the classroom at a suburban vocational high school in the northeastern United States. The study was guided by Roger's diffusion of innovation model/theory, which outlines how technology advances spread throughout a population, from introduction to wider adoption. Data were collected through individual semistructured interviews with 10 vocational high school teachers. Thematic data analysis followed an open coding process that identified categories and 3 emergent themes: (a) resources for technology integration in the classroom, (b) current technology integrated in classrooms, and (c) barriers to technology. The 1st theme had 2 categories: (a) online resources and (b) coworkers as resources. The theme, barriers to technology integration, had 3 categories: (a) time and implementation, (b) professional development, and (c) attitudes. The findings led to the creation of a 3-day professional development project that supports technology integration in the vocational high school classroom. The findings from this study provide the vocational high school with technology initiatives that influence student learning and serve as a platform for sharing and improving teaching practices, leading to positive social change to support teaching and learning and achievement of educational outcomes.

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Dedication

I dedicate this study to my deceased parents, Flossie and Boston Morrison, whose love and support have always been my rock. Although neither of you are here to see me complete my research study, I know that you are my angels who continue to watch over me through life's journey.

Acknowledgments

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To my daughter Lauren thanks for your love and support during the process and my nephew Rolando thanks for helping me find words that flow. Thanks to all of you for your patience and never doubting me to reach this goal, you are my inspiration!

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Section 1: The Problem

Introduction

The explosion of social networks, students' use of handheld devices, and students' demand for quick access to new knowledge have challenged teachers to learn new technologies and integrate them in the classroom (Ruggiero & Mong, 2015). The rapid changes in technology have increased the availability of information and improved technological communication (Gunn & Hollingsworth, 2014). Technology is an expected tool for teacher use in schools that empower students for success (Dotson & Clark, 2015). Although teacher comfort with technology is a concern, administrators at a suburban vocational high school in the northeastern United States acknowledged teachers' need for technology skills and developed a technology plan to help them in developing these skills. According to changes in the 2013-2016 local technology plans, teachers and administrators needed to reinvent the role of technology in the classroom to improve student-learning outcomes. Although more than half of the teachers in the district requested innovative technology tools, such as interactive classroom products, projectors, and iPads, teachers did not believe they had been properly trained to use the technology appropriately (B. S., personal communication, July 10, 2017). Several teachers mentioned to administrators about failing to learn best practices when implementing technology into classroom instruction and that current professional development (PD) seminars about technology integration had not led to improved student-learning outcomes (S. P., personal communication, August 24, 2016).

Teachers at the vocational high school were assigned to collaborate in subject-specific professional learning communities (PLCs), whose goal was to support student learning and improve instructional practices in the school. According to DuFour, DuFour, Eaker, Many, and Mantos (2016), PLCs comprise a group of educators that assembles regularly, share knowledge, and work collaboratively to expand teaching skills and the academic performance of students.

During the 2016-2017 academic year, the focus of the PLC meetings supported district technology initiatives, including barriers to successful integration. Teachers from various PLCs contacted administrators, along with the teachers involved in the district technology initiative PD, to help improve practice and assist with the development and integration of technology tools. However, following assistance and PD offerings in the vocational high school PLC meetings, teachers still noted that they were having difficulties integrating technology into the classroom (Assistant Principal, personal communication, October 13, 2017). The purpose of this qualitative project study was to investigate vocational high school teachers' perceptions about participating in PD related to technology integration in the classroom and barriers to successful PD for technology integration in the classroom at a suburban vocational high school in the northeastern United States.

The high school developed a plan to help educators continually develop skills that positively affect the classroom environment. Implementing a technology integration plan requires several steps: (a) planning for technology, (b) addressing teacher concerns, (c)

understanding and addressing areas in which teachers lack technological skills, and (d) fostering mentorship and collaboration (Cox, 2012).

School district administrators mandated technology integration plans to increase the success of classroom instruction and student achievement (Hixon & Buckenmeyer, 2009). One critical consideration regarding technology integration was teachers' pedagogical beliefs and attitudes (Ertmer, Ottenbriet-Leftwich, Sadik, Sendurur, & Sendurur, 2012). Teachers' understanding of technology integration and implementation are important to meet the needs of tech-savvy students.

Traditionally, PD is a series of disconnected training programs (DuFour et al., 2016). The shortcomings are evident when PD occurs outside of the school and focuses on entertaining participants (DuFour et al., 2016). Teachers indicate that an effective PD program includes support, focused content, and collaboration; without these elements, PD on technology will not lead to effective implementation in the classroom (T. R., personal communication, May 5, 2016).

The goal of PD is to enable educators to develop the knowledge and skills to address student-learning challenges (Mizell, 2010). Additionally, Mizell (2010) believed that PD must be planned, implemented, and effective to ensure feedback from teachers regarding learning needs. However, PD appears to be effective when it causes improvement in instruction and improvement with school leadership (Mizell, 2010).

The National Education Technology Plan from the U.S. Department of Education (2017) developed a model for schools to implement technology that satisfies the

requirements for learning. Title II, Part D, of the Enhancing Education through Technology Act of 2014 requires that schools implement high-quality PD because PD can be an important element in achieving effective technology integration (Santagata & Guarino, 2012).

Ertmer and Ottenbriet-Leftwich (2010) identified the types of barriers teachers experience that lead to unsuccessful technology integration: (a) beliefs, attitudes, and pedagogical ideologies; (b) content knowledge; (c) knowledge of instruction strategies and practices, and (d) new and revised instructional technologies.Snoeyink and Ertmer (2001/2002) categorized barriers as *external* or *internal*. External barriers include the lack of technological equipment and initiatives to support teachers, and internal barriers relate to teachers' beliefs, such as that technology integration will not change teaching practices (Snoeyink & Ertmer, 2001/2002). When school district administrators address the internal and external barriers, such as in PD, teachers' incorporation of technology increases and, consequently, may improve student-learning outcomes.

Teachers' values and beliefs in technology integration may affect instructional goals (Watson, 2014). Though technology integration can lead to improved student outcomes, when school districts purchase new technology and upgrade software without reviewing how the technology supports the curriculum and how teachers assess students, teachers are unlikely to use the technology (Ertmer & Ottenbriet-Leftwich, 2010).

According to Shulman (1987), teachers' knowledge of how to teach comprises several categories: (a) content knowledge, (b) pedagogical knowledge, and (c)

pedagogical content knowledge. Content knowledge consists of knowledge of the subject, whereas pedagogical knowledge includes teaching methods and classroom management strategies. Pedagogical content knowledge consists of how to teach specific content to a specific group of learners. Shulman's (1987) concept of pedagogical content knowledge combines knowledge of subject matter, knowledge of how to teach lesson content, and how to facilitate student learning.

Ertmer and Ottenbriet-Leftwich (2010) discussed curricular and learner knowledge. Curricular knowledge consists of understanding the characteristics of learners, their subject-related preconceptions, and educational goals and beliefs. The educational goals set for students affect the strategies teachers' use in the classroom. Learner knowledge is an understanding of the educational environment, including the school district, the school, and the classroom (Ertmer & Ottenbriet-Leftwich, 2010).

Teacher training can facilitate student learning and can lead to funding to support technology integration in the classroom. Funding for school districts is allocated to create effective classroom instruction for technology integration, and teacher development; otherwise, district funds are wasted (Potter & Rockinson-Szapkiw, 2012). According to Walker et al. (2012), "teachers struggle to incorporate new resources, tools, and instructional approaches into their teaching. In particular, teachers vary in their technology integration knowledge, as well as in their ability to design pedagogically sound activities" (p. 422).

Teachers' instructional practices can create barriers to effective implementation of technology. One such barrier is instructional inflexibility. Teachers who are inflexible or unwilling to conform to technology initiatives create a reduction in communication among educators, leading to isolation and the lack of technology improvement (Williams, Atkinson, Cate, & O'Hair, 2008). Additionally, inflexibility and isolation can lead to other ineffective teachers' practices and a lack of motivation (Williams et al., 2008). Teachers are expected to effectively use technology in the classroom; therefore, they must embrace positive attitudes and beliefs regarding how technology can benefit students' learning (An & Reigeluth, 2014).

The role of technology in the classroom is to prepare learners for the future of increased technology demands (Ruggiero & Mong, 2015). The Partnership for 21st Century Learning (2015), a national organization focused on student learning, combines the three Rs (reading, writing, arithmetic) with four Cs (critical thinking, creativity, communication, and collaboration) to transform technology education into a way to prepare students for the future. Successful implementation of technology into the classroom by teachers can lead to improved student learning outcomes while preparing students for success beyond the classroom.

Section 1 delineates the importance of technology integration for successful teaching and learning. Technology is an area that experiences continuous change, which requires teachers to continually update their knowledge of technology and how to incorporate it in the classroom (Ruggiero & Mong, 2015). Many teachers do not

incorporate technology with instructional practices effectively, meaning that the potential benefits are not being realized (R. H. personal communication, June 5, 2017). Technology integration may increase if teachers receive PD opportunities that include support after the PD has ended.

Integrating technology enables the processes of discovery and creation to work together, facilitating students success—in Grades K–12 and in college—such as obtaining desirable employment (Blair, 2012). Major technology initiatives include various types of instructional technology, providing beneficial experiences for teachers and students. Teachers require knowledge to structure lessons according to the learning environment and to use technology that will enhance learning (Roberts & Hsu, 2000).

Technology rapidly changes, and teachers and students must adapt to the changes and learn to use new and revised technology (Blair, 2012). Staying abreast of technology changes is challenging. The successful integration of technology improves students' achievement and teachers' confidence in using technology. Increased confidence could eradicate disparities in teachers' use of technology in the classroom. An effective approach to building teachers' confidence and knowledge of technology integration is the Roblyer technology integration model (Roblyer & Doering, 2010). This model involves having teachers work together to experiment with technology integration. Through practicing in a social context, teachers can discuss their experiences and receive support, fostering teacher growth (Cifuentes, Maxwell, & Bulu, 2011).

Definition of the Problem

Integrating technology in the classroom is important to improve students' learning; however, at the vocational high school in the northeastern United States, where the study took place, many teachers felt they were unprepared or unmotivated to integrate technology in instruction (C. R., personal communication, October 5, 2017). The problem addressed by this qualitative case study was vocational high school teachers' perceptions about participating in PD related to technology integration in the classroom and barriers to successful PD for technology integration in the classroom.

One principal and one vice principal led the high school. Combined, the school had a population of 400 students. Approximately 70% of the students in the vocational high school received free or reduced-price lunch. Fifty-one percent of the vocational high school student population was female, and 49% was male. The vocational high school student population was predominantly Hispanic (59.9%), followed by White (17%), African American (16%), and Asian (5%). The combined teacher population was 42 with a student to teacher ratio of 9 to1, which was lower than the average for high schools in the northeastern United States (NJDOE Report Card Narratives, 2013).

At the vocational high school, PLCs were established to support content area teachers in solving problems and improving student-learning outcomes. Each PLC was required to maintain minutes at weekly meetings. While the focus of each PLC during the 2016-2017 AY was technology integration in the classroom, to date, few discussions included technology integration or technology training (Assistant Principal, personal

communication, October 13, 2017). Research has shown that teachers' participation in technology-focused PLCs could be important to increasing technology integration (Bailey, 2002; Christiansen & Knezek, 2007). However, the majority of the meeting time was devoted to discussions about teaching strategy and teachers' complaints instead of technology improvement and integration opportunities (Assistant Principal, personal communication, October 13, 2017). Changing the focus of the PLC meetings could result in meaningful conversations about technology integration and resources that affect teachers, students, and the district as a whole (R. H., personal communication, September 18, 2017).

The vocational high school's budget for the 2016–2017 AY allocated funds for an increase in bandwidth, computers, laptops, iPads, Internet access, and interactive whiteboards. However, less emphasis was placed on helping teachers modify their classroom practices to implement the technological resources or how to restructure classroom practices so that teachers successfully incorporated the technological resources (R. H., personal communication, September 5, 2017). Additionally, administration determined that the limited focus on teachers' technology practices creates an ineffective approach to meaningful technology implementation in schools. Additionally, teachers were expected to combine pedagogy with technology to achieve successful classroom instruction.

Title II, Part D, of the Enhancing Education through Technology Act of 2001 mandated reforms regarding technology in schools. The Educational Technology Plan for

the state in which the studies were conducted describes the obligation to coordinate educational technology for Grades K–12 students. The goals for PD were student preparation, administrative support, and technology access in order to be aligned with the vision mandated by the state (The U.S. Department of Education's 2017 National Education Technology Plan Update).

Atkins et al. (2010) stated that "data to support schools in making decisions about which technologies to use and under what circumstances are limited" (p. 32). Research on PD initiatives for teachers has focused on teachers' beliefs and attitudes rather than on learning outcomes (Thomas et al., 2012). Focusing on learning outcomes and teachers' practices may lead to an understanding of how to address teachers' perceptions and improve teachers' practices and student outcomes.

Rationale

Evidence of the Problem at the Local Level

Technological changes require a shift in instructional approaches in schools (Thota & Negreiros, 2015). Additionally, leaders of Grades K–12 schools should focus on initiatives to integrate technology in the classroom to offer opportunities to differentiate instruction, which could lead to improved student learning outcomes (Thota & Negreiros, 2015). Leaders in the state where the study was located have demonstrated a commitment to providing students with a rich technology experience, with the goal of helping students achieve academic excellence (U. S. Department of Education, 2017). The Educational Technology Plan for the state discusses the importance of educational

technology in promoting academic success. The collaboration of technology teams, PD teams, administrators, students, parents, and teachers is needed to support the plan and thereby increase achievement (U. S. Department of Education, 2017).

According to the district's technology plan, teachers need to develop a level of technology knowledge that meets and/or exceeds the students' knowledge. During the 2015–2016 AY, teachers in the district expressed the need to increase their technology skills in order to meet the district's expectation. Teachers could benefit from PD opportunities in order to develop sufficient technology skills. Teachers have expressed dissatisfaction with current PD opportunities related to using technology in the classroom. District leaders have also? acknowledged dissatisfaction with PD and are working to implement flexible, ongoing PD that improves teachers' technological skills and, ultimately, student learning (T. E., personal communication, May 2016). To align with the vision of the U. S. Department of Education (2017), the vocational high school selected for the study developed a plan for the 2016-2017 AY to increase technology integration in all content areas.

The district's vocational school administrators and teachers have articulated the need for PD opportunities and how to improve technology integration in the classroom. Teachers have expressed their frustration with limited technology support and lack of needed resources, which have been barriers to technology integration (M. E., personal communication, May 2016). The results of the qualitative project study may lead to

initiatives that help teachers increase technology implementation, which could improve classroom instruction and lead to student achievement.

Evidence of the Problem in the Professional Literature

The U.S. Department of Education's 2017 National Education Technology Plan Update indicates that public education needs to incorporate technology for the purpose of "improving student learning, scaling best practices, and using data for continuous improvement by the year 2020" (U.S. Department of Education, 2017, p. 150). Incorporating technology in the classroom has also been a focus of the International Society for Technology Education (ISTE). The ISTE developed the National Educational Technology Standards to provide teachers with a model for creating a classroom environment fostering creativity, critical thinking, collaboration, and real-world application, helping students develop the skills required beyond the classroom. Technology-based instruction prepares students to meet the demands in the technology workplace and fosters higher-order thinking skills (U.S. Department of Education, 2017). Though schools are adopting technology plans, not all teachers are integrating technology in the classroom effectively (Mouza, Nandakuar, Yilmaz Ozden, & Karchmer-Klein (2017).

Purpose

The purpose of this qualitative project study was to investigate vocational high school teachers' perceptions about participating in PD related to technology integration in

the classroom and barriers to successful PD for technology integration in the classroom at a suburban vocational high school in the northeastern United States.

Definitions of Terms

The following terms were used throughout this study.

Content knowledge (CK): Content knowledge generally refers to the facts, concepts, theories, and principles that are taught and learned in specific academic courses, rather than to related skills—such as reading, writing, or researching—that students also learn in school (Minor, Desimone, Lee, & Hochberg (2016).

Information and communications technology: equipment used to handle telecommunications, broadcast media, intelligent building management systems, and network-based control and monitoring functions (Twining, Raffaghelli, Albion, & Knezek, 2013).

Technology integration: the use of technology practices in the classroom and curriculum that meets learning and assessment outcomes (Wachira & Keengwe, 2011).

Significance

The purpose of the qualitative project study was to investigate vocational high school teachers' perceptions about participating in PD related to technology integration in the classroom and barriers to successful PD for technology integration in the classroom at a vocational high school in the northeastern United States. District vocational high school teachers attend yearly PD training to help them increase their technology skills and use strategies for improving classroom teaching. By adding effective PD development in

technology and eliminating barriers to successful implementation, the school may increase the overall strength of the PD programs (Killion, 2016). This study can also be used as a tool that could galvanize effective education for students in the district and the state. Professional development is effective when the learning is collaborative, coherent, and continual (National Education Technology Plan Update, 2017). Teacher development is an applicable process of setting higher expectations and enhancing teachers' skills (Stahl, 2015). When teachers have greater knowledge of how to integrate technology into the classroom, they can better prepare students for college and career opportunities. With positive results, the district could have evidence that focuses on teacher technology training and student achievement.

The significance of this study is related to the role of technology in promoting teacher professional development success (U. S. Department of Education, 2017). The U.S. Department of Education's 2017 National Education Technology Plan Update provides a rich foundation for using educational technology to increase teacher knowledge and student success. The updated technology plan encourages significant support from school administration to seamlessly implement technology in schools.

Guiding Research Questions

For successful technology integration in schools, teachers should be trained how to use the technology as well as implement technology into pedagogical practice. At the suburban vocational high school in the northeast, teachers were not developing adequate knowledge through completing PD opportunities. Teachers' perceptions about their

experiences in PD and their preparation to integrate technology helped to facilitate the study. The following research questions guided this qualitative project study:

RQ1: What are vocational high school teachers' perceptions about participating in PD related to technology integration in the classroom?

This research question was supported by one subquestion:

SQ1: What do vocational high school teachers identify as barriers to successful PD for technology integration in the classroom?

Teaching with technology is important to help prepare students for their future (Stahl, 2015). However, when teachers do not receive technology-based PD that prepares them to incorporate technology in the class effectively, barriers exist for student success (Carver, 2016; Roberts & Hsu, 2000). This qualitative project study explored vocational high school teachers' perceptions about participating in PD to integrate technology in the classroom, and identified barriers to successful PD for technology integration in the classroom.

Review of the Literature

Introduction

This literature review examined teachers' attitudes toward technology integration, teachers' classroom practices, and the barriers to integrating technology. It included discussion of technology PD and the perceptions and behaviors of teachers during and after training. The literature review also covered the history of technology integration, how integrating technology can improve student learning, and the barriers that limit

teachers' knowledge of and support for successful technology integration. The review included discussion of theoretical perspectives and scholarly, peer-reviewed studies on the barriers to technology integration.

The literature review was conducted by scholarly databases, including the Education Resources Information Center (ERIC), Sage Premier, and Pro Quest Central; I also accessed the U.S. Department of Education website and the International Society for Technology in Education website. I focused on literature relating to teacher PD on technology integration and the impact of technology integration on student achievement. To find literature on these topics, I used the following phrases: *school technology integration, teacher technology professional development, professional learning communities, professional development and student outcome, information and communications technology,* and *the impact on technology implementation plans.*

After researching best practices for technology implementation in the classroom and opportunities for teachers to learn new technology to integrate in the classroom, it was natural to investigate options for how to teach the teachers to learn new technology for the classroom. There was a gap in the literature that supports teacher technology development for the classroom where collaboration and sharing exist for training the teachers. Therefore, this study was designed to explore whether teachers will learn and adopt the use of technology in instructional practices.

Diffusion of Innovation Theory

The conceptual framework guiding this study was Roger's diffusion of innovation theory, which promotes understanding how academics use technology and the direction for developing strategies to increase its use in the academic environment (Rogers, 2003). Rogers (2003) diffusion of innovation theory described how innovations are implemented through five characteristics, which influence the rate of change: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability (p. 3). *Relative advantage* relates to the degree that innovations are perceived to be better than the idea it supersedes, while *compatibility* denotes the degree that an innovation is compatible with existing values, past experiences, and potential adopters. *Complexity* identifies the degree to which an innovation is challenging to use. *Trialability* identifies the degree to which an innovation is experimented on a limited basis, and *observability* purports the degree to which an innovation is visible to users. The characteristics described in the diffusion of innovation theory provide outcome driven results to qualify the effectiveness of technology (Rogers, 2003).

Rogers (2003) diffusion of innovation theory endorses the ability to share relationships between users to facilitate the awareness of the technology. In order to estimate the effect of teacher technology awareness, user engagement for changes in technology needs should be identified.

Collaborative learning and shared practices helped to support the changes in teachers' technology awareness and engagement to develop technology skills. Therefore,

Rogers (2003) theory of diffusion supports the technology integration plans for teachers because teachers learn best by sharing and working collaboratively.

Review of the Broader Problem

Teacher Professional Development Purpose

Teacher professional development allows teachers to learn and become knowledgeable about practices that influence classroom instruction and student achievement. By collaborating, sharing best practices, and curriculum, teachers learn from the experiences of others in the education community (Hixon & Buckenmeyer, 2009). Teachers' implementation of what they learn in PD opportunities is influenced by the value teachers place on the PD (DeMonte, 2013). However, PD opportunities allow teachers to place minimal value on technology integration. However, teachers may believe they can be effective in the classroom without technology integration (Thota & Negreiros, 2015). For example, a teacher may achieve a high performance rating without applying technology concepts learned during PD sessions. A disconnect between PD and professional practice might continue to exist especially if teachers' prior knowledge of PD training is nonexistent (Minor, Desimone, Lee, & Hochberg, 2016). Prior knowledge of PD training is content that helps build a higher level of CK.

School communities are built on principles that support teachers' growth and development (Owen, 2014). These principles include being democratic, inclusive, not authoritarian, and self-determined; using natural capacities and networking; applying social justice and equity; integrating service; and demonstrating an appropriate attitude

(DuFour et al., 2016). Communities of learning commonly shared community interests; encourage collaborative activities and discussions produce resources that represent shared interests (Oliver & Townsend, 2013).

Preparing Student Learners

Due to the pervasiveness of technology in the classroom, the traditional teaching methods may no longer be appropriate to support student-learning outcomes (Curwood, 2011; Gunn & Hollingsworth, 2014) Traditional learning methods such as memorization, repetition, and basic comprehension are considered lower order thinking skills that may no longer be appropriate for technology savvy students; however, higher order skills such as critical and creative thinking could lead to improved student achievement (Gunn & Hollingsworth , 2014; Krathwohl, Bloom, & Masia, 1964). Teachers are key players in the effective integration of teaching and learning. Although technology-based instructional practice and digital communication tools often allow student learners to process data and information quicker, teachers may not have the requisite skills to ensure a technology-based curriculum is appropriately integrated (Curwood, 2011). Therefore, in order to make the necessary pedagogical modifications to improve instructional practice supporting technology for student learners in the classroom, the establishment of required teacher technology skills might be fundamental for success (Gunn & Hollingsworth, 2014).

Students are better prepared to achieve academic success when teachers have appropriate content area knowledge and are able to appropriately utilize technology to

support learning (Pritchett, Pritchett, & Wohleb, 2013). However, for technology integration to be successful in the classroom, teachers should feel confident about their ability to use the technology and believe in the benefits of technology to support student learning (Berrett, Murphy, & Sullivan, 2012). Therefore, developing opportunities for teachers to learn new technology while offering a supportive environment for practice could strengthen pedagogical practice and lead to teacher confidence in the classroom.

Barriers to Technology Integration in the Classroom

Barriers to effective technology integration include lack of resources, limited access to technology, subject culture, assessments, hardware issues, and teachers' beliefs and skills (An & Reigeluth, 2014). New technology initiatives are introduced to reach new goals and higher student achievement. These initiatives are often met with challenges from a school district's normal activity (Laferriere, Hamel, & Searson, 2013). School district leaders need to address these barriers in order to achieve district, state, and national goals regarding technology integration. Research has identified barriers to successful technology integration such as (a) students' lack of computer skills, (b) teachers' lack of training and exposure to technology, (c) teachers' lack of technology support, and (d) teachers' lack of time to implement technology-integrated lessons (Carver, 2016; Roberts & Hsu, 2000). In a mixed method study to examine beliefs and practices regarding technology integration, Roberts and Hsu (2000) described how teachers integrate and use technology in the classroom. Eight teacher interviews and observations along with 152 online surveys were conducted with findings indicating that

teachers who have “good” technology skills were more acceptant of the technology integration plan than teachers without good skills (p. 37). Common deficiencies of technology skills lack of in-service training, and availability of technology, along with restricted curriculum, affects technology initiatives (Roberts & Hsu, 2000). Researchers indicated that there is lack of teacher technology training in the U.S. and suggested that PD is on the rise (Carver, 2016).

Barriers to technology integration are classified as *extrinsic* or *intrinsic*. Khalid and Buus, (2013) described extrinsic barriers to include limited access to technology, time, support, resources, and training, and intrinsic barriers comprise attitudes, beliefs, practices, and behaviors. Additionally, other barriers relate to the alignment between technology and curriculum and to the practices of veteran teachers, novice teachers and age differences (El-saadani, 2013). Veteran teachers may struggle with the concept of technology integration, believing that technology does not fit with the instructional content (Plair, 2008). However, (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010; Plair, 2008) expressed that new teachers likely were trained in their certification programs regarding how to successfully integrate technology with instruction. Veteran teachers and other teachers who lack technology skills could observe the practices of teachers who successfully use technology in the classroom.

Khalid and Buss (2014) discussed an additional barrier to widespread incorporation of technology in the classroom revolving around the rapid changes in technology that require teachers to continually learn how to use and incorporate new

technological tools. Technological innovations offer teachers the opportunity to expand their knowledge and rethink instructional practice. However, if technology plans are misaligned with the curriculum, teachers may not successfully incorporate technology in the classroom (Ottenbriet-Leftwich et. al. (2010). While some teachers are skeptical of technology integration, barriers may exist when teachers are unable to view the relevance of technology tools to the curriculum. Ottenbriet-Leftwich et al., (2010 stated that a barrier to successful technology implementation could be from teachers not actively supporting technology integration.

Integrating technology transforms classroom instruction and increases student success (Yu, 2013). However, researchers have suggested technology integration is successful and effective when school district leaders provide the necessary resources and tools for the integration (Yu, 2013). The integration process begins with providing computers, Internet access, and other tools for teachers (Yu, 2013). Additionally, equipment maintenance is also important in successfully integrating technology; district leaders need to ensure technicians are available to install equipment and support users. However, not all school districts provide essential technological tools, resources, and support, which leads to difficulties with the integration process (Yu, 2013).

Teacher beliefs play a significant role in the process of technology integration because beliefs influence daily decision-making and practices (Ottenbriet-Leftwich et al., 2010). When teachers believe that the technology is relevant to the class content, they see the value of technology and implement technology practice in the classroom to motivate

students to learn. Carver (2016) found that the increase of student engagement frequently benefited technology usage. Additionally, teachers' values may also affect whether teachers incorporate technology to achieve instructional goals.

Carver (2016) noted that interviewed and observed novice and experienced teachers to determine how they used technology in the classroom. Carver found that teachers use technology during lesson planning, and to make effective technology decisions that will increase learning opportunities. Additionally, Carver also theorized that effective implementation of technology would contribute to student success. When teachers learn to use technology that is relevant to the content they are teaching, they are more likely to see the value of the technology and to implement it in the classroom (Mayes, Natividad & Spector 2015; Snoeyink & Ertmer, 2001/2002). When the technology is not specific to the content, teachers are less likely to use the technology during instruction (Carver, 2016; Williams et al., 2008; Yu, 2013). Teachers continue to struggle to find effective ways to integrate technology into instruction, which is caused by classroom use and their own skill level.

Professional Development

Researchers describe that PD is important to teacher development and the focus of the PD training should be authentic with integrated tasks to motivate teachers (Anthony, 2012; Van den Bergh, Ros, & Beijaard, 2013a). In a qualitative study, Van den Bergh et al., (2013a) observed 16 teachers watching a 20-minute video where students offered feedback about teacher technology use in the classroom. Van den Bergh et al. (2013a)

found that the video observations demonstrated that the teacher collaboration amongst colleagues was authentic and that integrated activities promoted effective teacher development. Study results indicated that teachers should become actively engaged in meaningful discussion, planning, and practices regarding technology problems and solutions (Van den Bergh et al., 2013a). Anthony (2012) also determined that collaboration among teachers facilitated instructional success. Professional development offers opportunities for collaboration to improve instructional practice.

Teachers' understanding of high quality PD is generally displayed in the classroom leading to improve teaching practices (Murrill, Thomas, & Reynolds, 2013). Darling-Hammond (2010b) described the framework for quality teacher PD as planned hours of collaboration at school for veteran and new teachers to attend professional seminars to improve teacher preparation. The effectiveness of teacher PD involves substantial time and contact hours along with teacher experiences that encourage professional support for change in teaching practices and preparation (Glover et al., 2016; Murrill, Thomas, & Reynolds, 2013).

Jordan (2011) described how teachers' practices could change when they receive support from other school personnel. Teachers feel that this support is important because of their direct impact on student learning (Hadar & Brody, 2013). Researchers found that focusing on student learning is a useful strategy to motivate teachers to apply technology in the classroom (Hadar & Brody, 2013; Jordan, 2011). In a qualitative case study, Hadar and Brody (2013) determined causes for student achievement in relation to teacher

practices at three different elementary schools. Each school implemented a different approach for teacher practice to promote student achievement. Additionally, the teachers and administrators collected formal and informal assessments that determined areas of professional development improvement, which would directly relate to student achievement. Based on the study results, teachers were able to identify and perform more effectively in the classroom due to improved practice directly related to professional development activities (Hadar & Brody, 2013).

Transformative Trend

The changes in education have a variety of transformative actions for new and veteran teachers as significant struggles continue to prepare teachers for success in the classroom (Brouwer & Korthagen, 2005; Cochran-Smith, 2010; Korthagen, Loughran, & Russell, 2006; Zeichner, 2012;). The reimagination of courses transformed by technology describes how the connection is made between content, subject matter, and technology (Sandford, Hopper, & Starr, 2015). Sanford, et al. (2015) suggested that a strong teacher education program should prepare pre-service teachers to support classroom activities through technology-based pedagogies.

The transformation of technology for teacher education is grounded in models that categorize changes in classroom projects and activities (Oliver & Townsend, 2013). Oliver and Townsend (2013) demonstrated the use of the following models to help teachers and principals with technology integration and teacher development: (a) pre-service training, (b) long-term courses, (c) short-term workshops, (d) institutes, (e)

coaching/mentoring, (f) learning communities, and (g) product/assessment approaches. The revolution of change is established when new practices and concepts are performed daily. For example, new teacher training practice plays a significant part of teacher education programs and influences the ability to integrate technology into the classroom successfully (Darling-Hammond, 2010a). While veteran teachers struggle to communicate and collaborate about technology integration needs in the classroom, new teachers come into the profession with stronger technology skills (Darling-Hammond, 2010a). However, Diana (2013) found that when new teachers are paired together with veteran teachers to skill build in the process of technology implementation, they build more complex teaching and learning practices. Additionally, transformative trends increase the concerns for ICT integration in education by the availability of resources, time constraints and educational software. Computer and educational shortage can potentially affect the teaching process (El-saadani, 2013).

Preparing Teachers for Technology Integration through PD

Professional development training to assist teachers' to integrate technology in the classroom generally focuses on many different topics such as personal productivity skills to increase teachers' comfort levels (Cifuentes et al., 2011: Gronseth et al., 2010). Additionally, PD focuses on teaching technology skills that influence classroom instruction (Cifuentes et al., 2011). Additionally, teacher PD that incorporates technology improvement and/or integration into the curriculum should include teacher standards across a variety of subject matter course content (Oliver & Townsend, 2013).

Researchers identified different PD approaches for teacher technology integration training that could lead to increased student achievement (Brinkerhoff, 2006; Keengwe & Onchwari, 2009; Oliver & Townsend, 2013). Brinkerhoff (2006) posited that the long-term course approach involves a university-based course with projects designed to teach lessons planning and media evaluation. Brinkerhoff discussed the value of utilizing the short-term workshop, which is the most popular model for in-service teacher technology training for a 15-day period. The short-term workshop process is described as the *academy approach* because it includes the training and in-service training component (Brinkerhoff, 2006). Coaching or mentoring is another form of PD training, which involves trained and experienced technology users as mentors supporting teachers who are less experienced in technology integration (Thota & Negreiros, 2015). Experienced teachers vary in what they learn and how the knowledge is translated into practice. High-quality PD implements new practices and teacher knowledge to increase student achievement (Gowlett, Keddie Mills, Renshaw, Christie, Geelan, & Monk, 2015).

Technology Professional Development

Technology professional development can help teachers develop the knowledge and skills needed to create appropriate learning experiences for students (Gaytan & McEwen, 2010). Professional development offers teachers activities to support an effective student learning approach. However, the *one-size fits-all* approach, and lack of recognition are attributes of inadequate technology learning (Opfer & Pedder, 2011). Professional development is beneficial when barriers to technology implementation are

removed and when technology training is personalized and focused on teachers' beliefs about teaching and learning (Hixon & Buckenmeyer, 2009). Therefore, successful PD could provide effective training opportunities that support teachers implementing technology into the classroom.

Teachers often do not use technology to enhance learning; rather, technology is just present, even when sufficient training and resources are available (Robyler & Doering, 2010). Technology has an influence on education that requires new strategies allowing for new access and training opportunities (Solomon & Schrum, (2007). Integrating technology can motivate and assist students to learn, enhance instruction, increase students' and teachers' productivity, and sharpen students' technological skills (Blair, 2012). Students receive greater benefits from applying technology to the instructional materials used by the teacher than from simply utilizing technology tools in the classroom (Hixon & Buckenmeyer, 2009). Despite the abundance of technological equipment and the significant funds allocated for technology incorporation, schools have made little progress in incorporating technology into instructional practices (Hixon & Buckenmeyer, 2009). Therefore, technology has had a limited effect on student learning (Schrum & Levin, 2013). The lack of technology integration indicates that teachers need more training and support to integrate technology. The PD to support technology integration should use authentic, integrated tasks to activate teachers with significant feedback to stimulate conversations and practice (Van den Bergh et al., 2013a). Because PD in general has not been effective regarding technology integration, school leaders

should consider implementing teacher training, with a focus on incorporating technology to increase student achievement (Van den Bergh et al., 2013a).

Technology Integration in the Classroom

Technology integration planning (TIP) is a collaborative approach that focuses on teamwork practices that support course content and student achievement (Scalise, 2016). Many schools require students to power down devices with social media available or block social media applications when students enter the school building. However, with appropriate teacher training, a reasonable approach may be to allow students to use social-media-ready devices and have teachers model appropriate online conduct that supports subject matter learning (Scalise, 2016). Scalise (2016) stated: "TIP include best practices that include understanding how, when, and why technology can be infused into education to improve learning outcomes. For the technology planning is effective when it is strategically planned and focuses on specific learning outcomes" (p.55). Teachers throughout the United States have been recommended to increase their technology use in the classroom, which has been an ongoing process among educators (Ertmer et al., 2012). Curwood (2011) found that the impact of technology integration in instructional practice can be effective for new and veteran teachers as a variety of tools and resources are incorporated. Curwood (2011) determined that the observation of technology practices with colleagues in a PLC might improve how teachers collaborate in a school where teaching practices and technical skills are reflected.

Technology integration, however, still has disparities that divide teachers from technology curriculum goals and district plans (Ruggiero & Mong, 2015). Teachers' participation, curriculum, and implementation are at different levels. To use technology effectively in the classroom, the teacher should be the key stakeholder in the implementation process to create a learning environment where technology is an indispensable tool of education (Arrowood, Davis, Semingson, & Maldonado, 2010; Ertmer et al., 2012; Vannatta & Banister, 2009).

In a study by Harris and Hofer (2014), technology PD was compared before and after training through qualitative interviews with teacher participants that resulted in learning activities that focused on student intellectual development. Additionally, Gaytan and McEwen (2010) conducted a meta-analysis of 20 studies assessing professional development for technology integration and then developed a model for evaluating the impact of PD. By analyzing selected studies, Gaytan and McEwen (2010) found that developing a high quality model consisted of five evaluation levels: (a) feedback from participants, (b) participant learning, (c) organizational support, (d) changed instructional practices, and (e) student impact. Diversified instructional practices that include a variety of evaluation levels with educational technologies adjoined to instructional planning will produce high quality student learning.

Implications

Teachers are the mediums that bring learning to the classroom producing improved student achievement. Through PD, learning about technology integration

increases the efficiency of instruction and improves student success (Killion, 2016). The transformation from PD development to classroom practice needs supportive measures of leadership and adequate resources (Darling-Hammond, 2010; Heller, 2005). Research also indicates that the perceived information, knowledge, beliefs, and classroom behaviors of teachers can reflect the direction and focus of PD planning and implementation (Verloop, Van, Driel, & Meijer, 2001). Therefore, if teachers are unable to adequately integrate technology in the classroom, PD training could focus on removing barriers, which could lead to successful technology integration in the classroom.

Research has shown that when the focus is on specific teaching practices, PD increases the use of those practices in the classroom (Desimone, 2009). School funding may limit the elements that support effective PD transfer. However, research has also identified that teachers' participation in technology training could be important to increasing technology integration (Bailey, 2002; Christensen & Knezek, 2007). Research also indicates that technology funds have been allocated for the purpose of integrating technology in the classroom, which is a focal point of educational reform at the federal, state, and local level (Bailey, 2002; Christensen & Knezek, 2007; Forte, 2010; Lowther et al., 2008). The goal of selecting effective technology training for PD practice could develop a strategy to improve teacher pedagogical practice in the classroom and lead to student success.

For technology integration to be successful, administrators need to provide teachers with adequate support (Anderson & Dexter, 2005; Ertmer et al., 2010).

Technology implementation plans will continue to be initiated as new and improved technologies are introduced. At the vocational high school, administrators were concerned that teachers were not sufficiently incorporating technology to achieve the objectives of the current integration plan. Through technology integration, teachers can help students develop problem-solving skills, set goals, negotiate, and resolve conflicts—real-world skills students need to be successful.

This study and project could offer teachers the ability to cope with technology integration in a positive form that embraces the change and its impact on student learning and the school district. By supporting teacher PD technology integration training, school leaders can create an environment with ongoing support for teachers. When teachers are supported in their development, they may be more likely to participate in training, to accept accountability for their development, and to share and gain a wealth of knowledge. Teamwork and consistent support could improve teachers' views of PD. Consequently, teachers may be more likely to increase their knowledge and to learn and implement teaching strategies that improve student success. The data gathered and analyzed as part of this proposed project study might be of interest to school districts that are experiencing issues with teacher technology training and professional development concerns. When teachers develop a better understanding about technology initiatives, they can improve their learning and make a stronger impact on student achievement.

The findings from this study may impact social change in the local school by helping teachers to enhance their technology skills, which could potentially help improve

pedagogical practice leading to improved students' performance. After gaining an increased understanding of high school vocational teachers' perceptions about technology integration in the classroom, I created a 3-day professional development seminar based on the development of successful strategies for technology integration into the vocational high school curriculum.

Summary

Technology integration is effective when stakeholders are involved in the process and understand the benefits of technology use. As the individuals responsible for integrating technology into the classroom, teachers' beliefs, attitudes, and willingness affect the success of technology integration initiatives. The literature indicated that (a) teachers' knowledge about pedagogical practices based on technology integration and (b) PD training related to technology incorporation in the classroom can improve practice. Therefore, incorporating educational technology is necessary to improve the quality of classroom instruction.

The literature indicated the importance of integrating technology to promote student achievement. A technology integration plan includes (a) providing teachers with PD on a wide range of technology, (b) support, and (c) a vision for using technology, as well as (d) ensuring teachers, students, and staff has access to a high-speed and well-maintained technology infrastructure. The results could lead to increased academic achievement and competitive skills that prepare students beyond the vocational high school. According to the literature reviewed, the technology should integrate with federal

and state curriculum standards. For technology to be incorporated successfully, various barriers should be removed. Barriers to successful technology implementation include teachers' beliefs and attitudes, time constraints, inadequate training, and a lack of support.

Section 2 includes a description of the study's qualitative method and project study design, the study sample, the process for protecting participants, the data collection method, and the data analysis method. Data were collected from teachers via interviews and focus groups. The data were analyzed to identify categories and themes.

In Section 3 and Section 4 I discuss the findings and propose a project that will address the issues after the analysis of the data. In Section 4 I present reflective statements and conclusions based on data from the study. I also provide recommendations based on the findings.

Section 2: The Methodology

Section 2 contains the methodology for the project study. This section includes an overview of the study, the research method and design, potential participants, ethical considerations, data collection, and data analysis. This section concludes with an explanation of the assumptions, scope, limitations, and delimitations.

Overview of the Study

The purpose of the qualitative project study was to investigate vocational high school teachers' perceptions about participating in PD related to technology integration in the classroom and barriers to successful PD for technology integration in the classroom at a suburban vocational high school in the northeastern United States. Therefore, the findings may lead to insight on how to increase the incorporation of technology through PD techniques, which could result in improved classroom instruction and, ultimately, greater student learning outcomes. This qualitative project study involved obtaining data on the perspectives of teachers at the targeted suburban vocational high school regarding the use of PD when training teachers to implement technology, as well as any barriers to successful technology integration that may exist. The following research questions guided this qualitative project study:

RQ1: What are vocational high school teachers' perceptions about integrating technology in the classroom?

This research question is supported by one subquestion:

SQ1: What do vocational high school teachers identify as barriers to successful technology integration in the classroom?

Research Design and Approach

The qualitative approach was ideal for this project study because the focus was on exploring and acquiring an understanding of a human phenomenon (Creswell, 2012). The exploration frequently occurs in the participants' setting and through data collection tools that allow for immersion in the experiences of the participants (Coolican, 2014; Creswell, 2012; Howitt & Cramer, 2011). Because the research study was a way to explore the perceptions of teachers by inquiring about their specific experiences with technology integration and barriers to successful integration, the qualitative project study was the best method to answer the research questions. In this study, participants' experiences were explored through a semi structured interview. Qualitative research typically involves a small sample size to enable an in-depth description of the phenomenon; the size of the sample is contingent upon data saturation (Merriam, 2009). In this study, the sample consisted of 10 participants—teachers at a vocational high school in the northeast United States. Teachers responded to general questions regarding technology integration in the classroom and barriers to successful integration.

Qualitative research seeks the perceptions of a person based on experiences and encompasses descriptive information (Merriam, 2009). Creswell (2010) stated that there are five approaches used in qualitative research: case study, ethnography, grounded theory, narrative research, and phenomenology. Ethnography is a form of qualitative

research that was developed by anthropologists specifically to study human society and culture (Merriam, 2009). Ethnography was not a selected approach because it aims to explore the way in which the researcher reviews cultural concepts and social groups rather than participant informants of life experiences (Hatch, 2002). Grounded theory is a form of qualitative research that emerges from data (Merriam, 2009). Narrative research is a form of qualitative research that uses stories and first person experiences of a person's life. The narrative research design was not selected because the research will focus on teachers' perceptions, not lives of individuals. Phenomenological research is a form of qualitative research that identifies the essence of a human experience (Merriam, 2009). The phenomenological research approach was not selected for this study because the goal of the study is not to understand the essence of a particular phenomenon through the lived experiences of participants but rather to explore the perceptions of teachers regarding technology integration and barriers to successful integration.

The quantitative approach was not appropriate for this study. The objective of quantitative research is to gather objective numerical data to test hypotheses and identify relationships between variables (Creswell, 2009). In contrast, the objective of this study is to explore the participants' personal experiences and subjective perspectives. Based on the open-ended questions and the need for directive and focused information, topical interviews were conducted (Rubin & Rubin, 2005). Rubin and Rubin (2005) determined that researchers play a more active role in topical research interviewing than they do in cultural research.

Other qualitative designs were not as appropriate for the study. In grounded theory, one category of information is extracted to write a story from its connection or to develop a theory based on data collection. The ethnographic design involves preparing a detailed description of participants, all of who belong to the same cultural group. In the present study, not all participants were members of one cultural group. Phenomenological research has a focus on understanding the essences of participants' lived experiences. . The goal of this study was to understand vocational high school teachers' perceptions about participating in PD related to technology integration in the classroom and determine barriers to successful PD for technology integration in the classroom.

Participants

Ten teachers who work at a suburban vocational high school in the northeastern United States were the participants for this study. According to the 2017 District Enrollment Report the vocational high school was in a district serving over 400 students, with 42 teachers, and four administrators.

Access to Participants

Access to participants required three levels of permission. The first level of access consists of acquiring permission to conduct the study from the Walden University Institutional Review Board (IRB). Permission10-16-18-0053425 from the Walden IRB is required to ensure that research meets the ethical standards of Walden University and adheres to U.S. Federal regulations (Walden University IRB for Ethical Standards in Research, 2014). The IRB specifically assures that there is informed consent, equitable

procedures, as well as minimized and reasonable risk (Walden University IRB for Ethical Standards, in Research, 2014). I submitted an application to the IRB that outlined the research questions, data collection tools, data points to be determined, data source, my plan for data analysis, participants to be used, potential concerns, and the plan to share the findings of the study. The process and scope of the plan provided the IRB an explanation of how data were collected and analyzed and the methods used to protect the participants.

Obtaining IRB permission indicated that this study met the ethical standards of Walden University and adheres to federal regulations (Walden University IRB for Ethical Standards in Research, 2014). Specifically, the IRB ensures the study methodology includes informed consent, equitable procedures, minimal, and reasonable risks (Walden University IRB for Ethical Standards in Research, 2014).

The second level of permission to access participants was requested from the study site school principal in a formal letter of cooperation that describes the study and explains the data collection method (see Appendix B). I described my role as the researcher, the goals of the study, and the potential benefits to the district. School administrators signed a letter of cooperation indicating they gave me permission to access names of qualified teachers for the study and to obtain data from the teachers through interviews.

The third level of permission consisted of gaining informed consent from the vocational high school teachers (see Appendix C). The third level of permission provided

specific explanations of the roles and responsibilities of the researcher as well as the purpose, benefits, risks, procedures, and a guarantee of confidentiality (Creswell, 2009).

Protection of Participants

For the present study, I adhered to principles for conducting ethical research involving human participants. Protecting participants includes obtaining informed consent from all participants, implementing measures to protect participants from harm (emotional, mental, and physical), and maintaining participants' confidentiality (Lodico et al., 2011).

To maintain ethical standards throughout data collection, the participants were assigned codes; to ensure participant confidentiality, the codes were used instead of the participants' names. Only I knew who the participants are. All hard copy data will be stored in a locked file cabinet at my residence. Electronic data will be stored on a secured computer drive. The participants were given the opportunity to review their interview responses. The process of member checking enhanced the trustworthiness of the study and will mitigate the risk of researcher bias (Van & Van, 2011).

Researcher–Participant Working Relationship

In order to maintain full disclosure, credibility, and ethical standards expected by Walden University, I explained my role as the researcher. Merriam (2009) stated the importance of recognizing potential bias, assumptions, and dispositions of the researcher. The researcher was fully responsible to reflect on and acknowledge bias before the study begins in order that the results have credibility (Merriam, 2009). My experiences,

although influencing my interest in the project, were not inserted into the findings in the study, as the importance of understanding the issue is more important than my personal feelings on the subject. The participants and I had no working relationship other than the district office we serve. Our district is made up of four campuses; the participants work in a different school district building under an administrator different from where I worked. At the time of this study, I taught business office technology to high school vocational education students at a different vocational high school in the district, helping students to develop office skills, learn to use software, and develop entrepreneurship skills.

Setting and Sample Participants

The high school selected for the study contains the Vocational Technology School and School of Career Development. One principal and one assistant principal lead each school. Combined, the schools have a population of 400 students. All of the teachers at the vocational high school in the northeast were asked to participate in this study. The first 10 teachers positively responding to my participation request were asked to participate in a semistructured interview.

Sampling Technique

Participants were obtained through purposeful sampling. This sampling strategy involves identifying and selecting individuals who are especially knowledgeable about or experienced with the phenomenon under study (Creswell & Plano-Clark, 2011). Using purposeful sampling helped ensure that the participants were able to provide valuable

information about preparing teachers to incorporate technology in the classroom and possible barriers to success.

Since all teachers in the district are required to participate in state mandated PD, potential participants were identified through the school district's PD list obtained from the building administrator. Each potential participant received an email letter containing an explanation of the research, the study procedures, assurance of participants' privacy, and potential benefits of the study and informed consent (see Appendix C).). Individuals who signed and returned the informed consent were contacted to schedule a semistructured interview. Each participant was selected based their employment as a teacher at the vocational high school where the study took place. The purposeful sample for this study was selected based on their role teaching at the vocational high school. A qualitative research study typically involves only a few individuals or cases to provide an in-depth description of the phenomenon, and the size of a sample within a case study is contingent upon the saturation of data (Merriam, 2009). Methods of inquiry used are case studies of individual cases (Stake, 1994). The local school district was considered a single case.

Data Collection

Interviews

The data collected from 10 high school teachers were face-to-face interviews conducted in the teachers' classroom or in the media center. To collect data during the individual semistructured interviews, I utilized a self-developed interview protocol,

which was reviewed by my project study committee and administrators at the vocational high school (see Appendix D). Ten teachers were asked to participate in a semistructured individual interview. The interview allows individuals to have one-on-one dialogue that elicits information from one another (Merriam, 2009). Additionally, interviewing allows the researcher to observe the participant while interpreting the environment around them (Merriam, 2009).

Interviews occurred face-to-face or over the telephone for the participants' convenience and an audio recording was made of each interview for my review and data transcription. According to Lodico, Spaulding, and Voegtle (2010), interviews in qualitative studies are audio recorded as a means to maintain data integrity. I asked the participants' permission to record the interview and then used the recording feature on my iPhone. I took detailed field notes to record responses as the participants were interviewed and transcribed those notes into a Word document. This additional method of recording data allowed for data integrity to be maintained throughout the interview process.

Face-to-face interviews took place at a conference room in the library on the vocational high school campus or the public library based on each participant's preference and to ensure privacy. Telephone interviews were conducted in an office located in the library. The interview setting was private and had little to no distractions. According to Yin (2014), case study research involves exploring a case within its natural setting. The interviews occurred at times that were convenient for the participants,

whether before, during, or after the school day. Before starting the interview, I asked permission to audio record information to ensure that participant responses are recorded accurately.

Prior to the start of each interview, I reminded the interviewee about the informed consent they previously signed and went through all of the pertinent information contained within that form. I made sure that participants understood that the interview was being recorded and transcribed. Interviewees were reminded of the purpose of the project study. Each interview lasted approximately 60 minutes. The same procedures outlined for face-to-face interviews were followed for the telephone interviews.

Semistructured interview questions were carefully designed as *open-ended* in an effort to prompt the participants for additional information. Additionally, I found it necessary to explore a different direction based on the discussion. The items developed for the interviews helped me generate data to answer the stated research questions posed for this study. The interview protocol was developed with my Walden Doctoral Committee to directly align with the research questions, and was provided to the vocational high school PD technology coordinator for expert review prior to interviewing any participants.

Before the interview started, all participants were assured of confidentiality and told that the interview could be stopped and that they could withdraw from the study at any time (Creswell, 2012). The interview questions were designed to align with five of the six questions discussed by Patton (2002): (a) knowledge questions, which regard the

participants' knowledge about the phenomenon; (b) feeling questions, which regard how the participants feel about the phenomenon; (c) behavior questions, which regard what the participants have done or are doing in relation to the phenomenon; (d) opinion questions, which regard what participants think about the phenomenon; and (e) background/demographics questions, which regard the participants' age, education, socioeconomic status, and other demographic characteristics. Patton (2002) described sensory questions, which were omitted due to lack of relevancy to the study.

I applied the interview protocol and structure that Bogdan and Biklen (2007) outlined by beginning the interview session through establishing rapport with the participant. I reviewed the purpose of the study, procedures for protecting confidentiality, and the participant's right to not answer a question or to stop the interview at any time. To encourage participants to explain their experiences and perceptions uninhibited by my perspective, I maintained a neutral tone and body language throughout each interview (Creswell, 2012). I used probing and follow-up questions to clarify and gain a deeper understanding of the participant's responses.

Accuracy and Credibility

When conducting a qualitative study, researchers should be concerned with generating findings that are credible (Guba & Lincoln, 1985). According to Yin (2016), establishing credibility is essentially a means to demonstrate that findings are true and accurate, supported by data collected from the field. Lodico, Spaulding, and Voegtle (2010), purported that credibility of a study is established when the participants are

represented truthfully throughout the data. To demonstrate that the findings of this study are true and accurate, I conducted transcript review and member checking with the participants who agreed to be interviewed (Lodico, Spaulding, & Voegtle, (2010). Once the interviews were transcribed, I sent a copy of the interview transcription to each participant to review the transcript for accuracy, which will confirm credibility of data (Lodico et al., 2010). Participants were emailed a transcript of their interview and asked to return it with any changes within one week. If any revisions were requested, I made those changes prior to data coding. Once I received confirmation that all interview transcripts are accurate, I began the data analysis process. Upon completion of coding and emergent themes, participants received an email invitation to perform member checking by reviewing the initial codes and themes to indicate whether they felt that the portrayal of their perspectives were correct (Lodico et al., 2010). Member checking verifies researchers' interpretation of the data resulting from analysis to ensure a holistic and valid understanding of the findings (Merriam, 1998).

Research Log and Reflective Journal

I manually entered the transcribed data, field notes from the interviews, and coded data in a research log. I included a date and time at the beginning of each entry. I made entries in a reflective journal. A reflective journal is useful for documenting thoughts, reactions, and other emotions that arise during the study. Through writing reflections in the journal, researchers can process their beliefs and values as they relate to the data collection experience (Lodico et al., 2010). The journaling process helps increase the

researcher's awareness of how personal feelings may influence the data and analysis (Lodico et al., 2010). I transferred the content in the research log and the reflective journal into a Word document to a password-protected computer file and stored the reflective log and journal in a locked file cabinet at my home.

Role of the Researcher

One of the researcher's roles is to provide a clear description of what constitutes evidence in the study. Other tasks are to fully explain the goal of the study and to adhere to the ethical standards of Walden University. An ethical standard of Walden University is to describe how the researcher's background could influence the study. I have been teaching for 15 years, working as a business technology educator, and an adjunct professor in the areas of computer science and preparation for preservice teachers. My experiences in professional training, development, and management have also contributed to my perspectives. Additionally, I have served my district as an evening school principal, supervising the business technology program for high school education and continuing education. However, I do not teach in the vocational high school or have any supervisory roles over the prospective participants. This program helps students not only satisfy the requirements to graduate from high school but also begin college and take advantage of job opportunities.

My background did not affect the data collection and analysis processes. To avoid researcher bias and maintain credibility in the study, I bracketed my personal opinions and perspectives by recording them in a reflective journal (Merriam, 2009). As another

strategy to avoid bias, the participants reviewed their interview transcripts to verify their accuracy.

Data Analysis

Data Coding and Analysis

Merriam (2009) defined how data collected in a study contain answers to the problem from which the study was derived and research questions generated; making data analysis the fundamental introduction of the answers obtained for the problem investigated. Qualitative analysis involves naming and categorizing a phenomenon by close examination of data (Strauss & Corbin, 1998). Descriptive codes and themes from the individual interviews were developed with the assistance of a qualitative computer software program. To facilitate the data analysis process, I used the computer assisted qualitative data analysis software program NVivo. The program is useful in setting the boundaries for data codes (Bodgan & Biklen, 2007; Castleberry, 2014). The program also organized and categorized the coded data, facilitating the identification of themes. I kept the coded data in a research log stored in a secure location. Memos made within the reflective log were to assist with the data analysis process. Creswell (2009) defined "coding as the organization of data into segments to formulate meaning by noticing categories and themes as they develop" (p.184). For this present study, the open coding process consisted of analyzing the data obtained from the interviews and categorizing the data into emerging themes and categories of information to find patterns and then labeling words and phrases with topics that represent the data (Bogdan & Biklen, 2007).

Creswell (2009) stated that creative categorizing reduces the number of labels. The categories represented factors from teachers' perceptions and experiences regarding technology integration in the classroom. Thematic data analysis helped to identify major concepts and to explain and present the findings (Lodico et al., 2010).

The data provided a means to develop a clear structure that builds a successful community of teacher-learners to enhance their knowledge leading to improved curricular changes for improved technology integration. No outliers were identified that warranted further data to achieve a deep understanding of participants' perceptions.

Data Analysis: Interviews

Descriptive codes and themes from the interviews were developed with the use of NVivo 12 a computer software program. The reflective log memos assisted with the analysis process. The coding and development of themes helped me to describe, classify, and interpret data.

Research Accuracy and Credibility

The credibility of findings was increased through the use of data triangulation from multiple sources of evidence and member checking, including teacher interviews, field notes, and a reflective journal. Data saturation occurred due to the redundancy of participant responses. Merriam (2009) recommended the use of multiple sources of data be used to confirm emerging themes and findings. For the present qualitative study, data collected from 10 interview participants were analyzed and coded for emerging themes, and placed in the proper categories (Merriam, 2009). In addition, participants were asked

to member check their data to confirm credibility. Upon completion of coding, participants received an email invitation to perform member checking by reviewing the initial codes and themes to indicate whether they felt that the portrayal of their perspectives was correct. Additionally, participants received a second email to verify that the codes and themes agreed with the portrayal of their perspectives.

Discrepant Cases

Lodico et al. (2010) explained that discrepancy in data analysis is unavoidable and that discrepant data that contradict provides varying perspectives. Negative case analysis involves examining data for examples that contradict other data (Lodico et. al, 2010). I examined discrepant cases in the interviews of the 10 participants upon the review of their reports. The varying information from the report was described and explained. Discrepant information adds credibility to the study in that the varying cases will increase the confidence that I gave full disclosure of the findings. Therefore, to add credibility to the present study, as defined by Lodico et al. (2010) discrepant information gathered that was contradictory to emerging categories and themes was included and fully explained in the study findings.

Assumptions, Limitations, Scope, and Delimitations

Assumptions

There were two main assumptions that can be made regarding this study. The first assumption was that the teachers in the suburban vocational high school would voluntarily describe their perceptions about technology integration. The second

assumption was that the teachers in the suburban vocational high school encountered barriers to successful technology integration.

Limitations

Limitations that could affect the findings and outcome of the study included the small sample size of 10 vocational education high school teachers from one suburban high school in the northeastern United States. Additionally, the nature of qualitative case study research does not provide the ability to generalize the results; however, the findings could be used for the development of a best practice policy that could promote positive social change in this suburban vocational high school in the northeastern United States.

Scope

The scope of the study was based on the perception of teachers from one suburban vocational high school in the northeastern United States about technology integration in the classroom and barriers to successful integration. The participants were chosen based on their role as teachers at the high school.

Delimitations

This study focused on the perceptions of teachers at one suburban vocational high school in the northeastern United States. It did not cover students due to ethical concerns of using teacher and student groups as well as the potential to disrupt the normal learning environment with the data collection process. Additionally, the research questions were limited to only teachers.

Data Analysis Results

Generating, Gathering, and Recording the Data

After recruiting participants for this project study, I scheduled interviews either in person or over the phone. Prior to beginning the semistructured interviews, I emailed a copy of the informed consent form to participants to later review before starting the interview. During the scheduled interview time, I reviewed the informed consent form with participants to ensure they understood their rights as participants in this project study. After obtaining verbal consent that participants understood the informed consent form and wanted to participate in the research study, I obtained a signed copy of each participant's informed consent form either in person or through email. I obtained consent to audio record the interviews to ensure I did not miss any data during this time as well.

Once I obtained informed consent, I began the interviews using the researcher-created interview protocol (see Appendix D). I asked permission, then audio recorded each interview using the recording feature on my iPhone, which is password-protected to prevent unauthorized access to the data. During the interviews, I also took detailed field notes where I recorded prevalent topics and patterns that emerged during each interview, body language expression, and differences in tone and inflection as well. After I completed the interview, I thanked each participant for his or her time and cooperation in the research study.

Data Analysis

When I completed the semistructured interviews for all 10 participants, I began to transcribe the data from audio recording into Word documents. Through the process of transcribing the interviews into Word documents by listening, rewinding, and relistening to the audio recordings, I became familiar with the data. Familiarization with the data is an important aspect of the data analysis process as a qualitative researcher begins to see the data as a whole instead of as separated documents. After reviewing the audio recordings, I could begin to see emergent patterns across the data that I would further explore during the coding process. Once I finished transcribing the interviews, I uploaded the transcripts into NVivo 12 to help manage and organize the robust qualitative data. With the data uploaded into NVivo 12, I began the coding process using the coding function of the software.

I coded the data by identifying meaningful sections of the data and applying a summative label. I went through the data line-by-line to ensure I did not miss any important information from each participant and captured the meaningful aspects of the data. By creating descriptive codes for the data, I was able to better conceptualize what participants discussed and underlying topics that continued to emerge within the data. Table 1 outlines an example of the coding process.

Table 1

Example of Coding Process

Code	Raw Data
Assistance is freely given	"The district media specialists share knowledge all the time."
Opportunity to share technology skills with colleagues	"Perhaps, we can make time for teachers to share technology skills."
Professional development does not focus on the needs of teachers	"It is often driven by administrators subject to sales pitches, rather than actual needs of the teachers and students."

After I completed the coding process for all the interviews, I compiled a list of all the resulting codes. I used this list to begin connecting codes together with similar sentiments or topics, creating clusters of codes with similar relationships. One example was the cluster titled "Online Resources to Help Teachers Integrate in the Classroom." This cluster was made of the codes 'use of internet to get answers about technology,' 'watch videos and Google advice about technology integration in the classroom,' and 'attend technology-based professional development through district.' These codes all referred to how teachers reported the use of online-based resources to learn about technology integration in the classroom and obtain insight about how others integrated technology in the classroom, which reaffirmed the lessons or techniques they learned in the technology-based professional development opportunities offered through the district. The process of clustering codes together continued until there were categories. In Table 2, I outlined the categories and the respective codes from this process.

Table 2

Categories and Their Applicable Codes

Category	Codes
Online Resources to Help Teachers Integrate in the Classroom	Use of internet to get answers about technology, watch videos and Goo gle advice about technology integration in the classroom, and attend technology-based professional development through district.
Coworkers as Resources about Technology-Integration in the Classroom	Assistance is freely given, opportunity to share technology skills among teachers, and reach out to other colleagues for advice on technology-integration.
Current Technology Integrated in Classrooms	Google classroom functions implemented, projector and SMART board integration, use of websites to manage classroom functions, and other technologies integrated in classroom.
Time Involved in Integrating and Implementing Technology are Barriers	No or limited technology integration, difficult to translate professional development into the classroom, network connection issues across school, time-intensive process of learning about technology integration in the classroom, and district needs to prioritize technology.
Lack of Appropriate Professional Development Opportunities to Support Teachers	District sponsored professional development is lacking, redundancy of professional development, professional development does not focus on the needs of teachers, and teachers should determine which professional development to attend.
Attitudes about Technology-Integration is a Barrier	Shame for asking for help about technology-integration, some teachers adopt skills but others choose to ignore it, do not fear technology and be open to adapting technology in the classroom, and must personally desire to use and understand technology to effectively integrate into the classroom.

I reviewed the categories to determine if there were further reductions possible. I found the categories of Online Resources to Help Teachers Integrate in the Classroom and Coworkers as Resources about Technology-Integration in the Classroom connected to one another regarding the resources participants' identified during the interviews. I labeled the theme, Resources for Technology-Integration in the Classroom and reduced the separate categories to Online Resources and Coworkers as Resources respectively. The categories of Time Involved in Integrating and Implementing Technology are Barriers, Lack of Appropriate Professional Development Opportunities to Support Teachers, and Attitudes about Technology-Integration is a Barrier also connected to one another through the focus on barriers associated with technology integration in the classroom. I titled the theme Barriers to Technology-Integration and renamed the categories as Time and Implementation, Professional Development, and Attitudes. The remaining category of Current Technology Integrated in Classrooms became a theme with the same title. Table 3 highlights the resulting themes and their respective categories.

Table 3

Research Questions, Themes, and Their Respective Categories

Research Question	Theme	Categories
RQ 1	Resources for Technology-Integration in the Classroom	Online Resources and Coworkers as Resources
	Current Technology Integrated in Classrooms	N/A
SQ 1	Barriers to Technology-Integration	Time and Implementation, Professional Development, and Attitudes

I reported discrepant cases found within the data during the presentation of the findings. Within each theme, I utilized raw data excerpts to support the findings and generate meaningful interpretations of the data. Where applicable, I added the field notes from the interviews to provide additional support.

Results

There were three overarching themes within the data: (a) resources for technology-integration in the classroom, (b) current technology integrated in classrooms, and (c) barriers to technology-integration. The first theme, resources for technology-integration in the classroom, had two categories: (a) online resources, and (b) coworkers as resources. The theme barriers to technology-integration had three categories: (a) time and implementation, (b) professional development, and (c) attitudes.

RQ1: **What are vocational high school teachers' perceptions about integrating technology in the classroom?**

The first research question asked about participants' perceptions about integrating technology in the classroom. Theme 1, resources for technology-integration in the classroom, and Theme 2, current technology integrated in classrooms, addressed this research question. In this section I discuss these themes and conclude this section with a summary, highlighting how these themes addressed research question one.

Resources for technology-integration in the classroom. Participants spoke about the available resources, through the school district and outside of the school district that they used to learn about technology-integration in their classrooms. For many participants, they discussed online resources they used to gain support and advice regarding not only what technologies to integrate in the classroom based on their subject but also to see how the functions of different technologies could enhance their classrooms. Participant 1 indicated participation "in free webinars online" to learn more about technology-integration in the classroom. Participant 1 reported spending time to find insightful and "helpful resources" so that this participant could continue to learn about technology-integration in the classroom. Participant 3 echoed Participant 1's sentiments regarding searching for online "webinars on my own time" to learn about technology-integration. Participant 3 felt that he has "learned more on my own" through online investigations when compared to district sponsored professional development. The opportunity to learn at Participant 3's own pace and obtain additional information should he need it has made a difference for him.

Similarly, six of the 10 participants reported taking time outside of the classroom to learn more about technology integration using online resources. Participant 4 shared "looking up procedures and tech answers on the internet" regarding different programs, applications, and software packages he encounters within the classroom. Many participants felt it was more beneficial to "search the internet for answers" to technology-related questions because participants often took time outside of the classroom to further explore this topic (Participant 6). Similar to Participants 1 and 3, who both took the time to learn about technology-integration on their own time, Participant 8 stated how "most of the time I learn on my own." Nonetheless, four participants did mention attending district-sponsored professional development. Participant 4 said that he "can usually find things worthwhile" during the professional development opportunities. According to Participant 3, he has "attended over 100 hours each year" on professional development but did not specify the percentage of that time the professional development focused on technology-integration in the classroom.

Despite attending professional development, participants noted there were gaps in their knowledge. For one participant, this was glaringly so due to this participant's previous experience outside the district. Participant 7 stated:

> Technology integration is what I bring from my experience working and researching technology outside of the district. I pull from resources such as industry standards on what can help my program advance with the latest in health

> care technology…. I pull resources from my colleagues on the collegiate level on what they do in their classrooms.

Participant 7 continued to share using "different sites" to understand technology-integration in the classroom and learn about new "apps used in medicine" from colleagues. By using his professional network of colleagues, Participant 7 was able to better adapt technology from individuals who had experience. The opportunity to learn from colleagues was an important aspect that emerged during the data analysis process. Participant 3 wanted to see "sharing [technological skills] with colleagues" become an aspect of professional development. Participant 3 proposed that by doing so, individual departments could "discuss individual concepts related to each course to devise and share alternative teaching methods." Participant 8 echoed the sentiments of Participant 3 and said:

> I would suggest that the ideas behind the training should incorporate methods of sharing ideas and training outcomes amongst your peers. This will help clearly communicate desired outcomes to the learners…. Technology plans should incorporate opportunities for teachers (within the same content area) to share the learning together, so that everyone is on the same page.

Participant 9 wanted to see time dedicated "for teachers to share technology skills" within their respective departments and school. By giving teachers the opportunities to share the skills they learned through personal research, teachers can provide assistance to their colleagues as Participant 4 admitted. Participant 4 explained that he would "readily ask

other teachers about something they might be more knowledgeable about concerning technology" but wanted to see time dedicated for teachers to share their technology skills without being solicited.

Participant 10 wanted to see effective support after technology PD training to help build technology skills to effectively utilize in the classroom. By giving teachers the opportunity to gain additional help after and during their technology integration process will provide an improved technology integration process for classroom use.

Current technology integrated in classrooms. Participants noted several technologies they currently used in the classroom. One technology that repeatedly came up in the semistructured interviews was the use of Google Classroom. When describing how to use Google Classroom, Participant 2 elaborated and said, "this included Google Docs, Forms, and other related Google products where students and teachers can share assignments." Participant 2 also described the use of Turnitin.com to check student work for plagiarism along with the projector. Participant 9 referenced the use of Google Sheets and Slides, in addition to other Google-associated technologies. While Participant 9 admitted, "these are minimal compared to all the technology available," Google software was a beginning for him to become more comfortable and familiar with technology-integration in the classroom. Participant 4 shared how he recently attended PD about the Makerspace movement and how to use coding for the purposes of teaching content in the classroom. Participant 4 explained, "coding is the next important step for the teaching-learning experience [in] K-12 education."

Participant 6 acknowledged using technology "to motivate students to complete an assignment at their convenience." The use of Google Chrome could have been referring to Google Classroom due to the multiple functions associated with the software. Participant 6 shared that using Google Chrome was ideal for students because "most students complete [their assignments] using their smart phone to access their document."

Participants' responses indicated that different subject areas have different needs regarding technology-integration. By identifying what best works to demonstrate the concepts needed in participants' specific subject, teachers can better understand and integrate the new technologies. An example of this would be Participant 8 who worked in the field of Business Office and Web Development where the use of Microsoft Suite, Adobe for Web Design, and Audacity for Podcasts were more applicable than other technologies. One participant currently used a unique technology in the classroom. Participant 7 said:

> I have integrated technology by using Sim Doll experiences with my students to have a real patient experience. This is a computer automated doll in which the students have a real patient experience where the mannequin can speak and interact with the student which helps to prepare the student for real world experience.

Outside of subject specific technologies, which both Participant 7 and 8 implied only resulted from personal research, the district focused on very basic technologies like Google Classroom (Participant 7).

Connections to RQ1. Participants perceived themselves as capable of successfully integrating technology in the classroom due to participants' use of a variety of training resources. Four participants took advantage of training provided by the school district. Participants also sought training opportunities as needed to bolster their technology integration skills. These participants learned on their own time how best to integrate technology in the classroom and noted a perceived difference in their ability to successfully integrate technology after doing so. Other participants perceived a knowledge gap when it came to integrating technology in the classroom. Participants took the opportunity to learn more about what they did not know related classroom technology integration by learning on colleagues and sharing skills. Participants provided suggestions for how school districts could provide better professional development related to integrating technology in the classroom but felt overall that they had the resources to use technology effectively in their teaching.

Participants' perceptions of their use of technology in the classroom was that they had flexibility in what they used, selecting from the myriad products in the Good suite, but were also able to tailor technology integration based on the subject. Participants integrated technology in the classroom with the limits of what was available through the school district. Much of what the school district made available for participants to use include the Google Classroom package, which participants used to share assignments with students, like Google Docs package, which participants used to share assignments with students like Google Docs and Google Forms. Google products were a nice easy

way for participants to explore technology integration in the classroom before moving on to more challenging technologies. Other participants used more specialty products based on the subjects these participants taught, like programs for web design. While participants felt they were able to successfully integrate classroom technology, they did identify barriers to doing this. These barriers are explored in depth in relation to SQ1, described in the next section.

SQ1: What do vocational high school teachers identify as barriers to successful technology integration in the classroom?

The subquestion focused on the barriers that participants identified to successful technology-integration in the classroom. Participants identified several barriers to technology-integration: (a) time commitment of personal investigation of technologies, (b) difficulty translating professional development into practice, (c) lack of applicable professional development, (d) issues with internet connectivity, and (e) attitudes about technology integration. The barriers were then associated with three themes: (a) time and implementation, (b) professional development, and (c) attitudes.

Barriers to technology-integration. Participants talked about several important barriers that prevented technology-integration within the classroom. The time commitment both inside and outside the classroom to learn about the technology was a significant barrier, especially considering how many participants investigated technology-integration during their own free time to this pursuit. Participant 1 explained the greatest challenge to technology integration was the lack of practice using the

technology before trying it in the classroom. During the interview it was unclear what the ideal solution would be, potentially additional professional development in integrating it in the classroom as a mock-trial of the technology to evaluate effectiveness. This suggestion could help alleviate potential issues when using a technology for the first time in front of students in the classroom. Participant 4 agreed with Participant 1 and said, "I think, for most classroom teachers, finding the time to learn ways to integrate technology is the most difficult obstacle to overcome." By having allotted time for teachers to practice technology-integration through on-site professional development, teachers may be able to mitigate issues with using the technology.

Participant 5 noted how this suggestion would only be viable if the district made technology a priority. Participant 5 admitted: "it's kind of hard to get assistance [about technology-integration] if technology is not a district-wide concern or priority." Until technology is a district-wide concern or priority, solutions to the barriers teachers currently face-integrating technology in the district would only be hypothetical (Participant 5). Many participants who talked about the issues regarding internet connectivity. Participant 7 noted that the district encouraged Google Classroom across the school, but since "the internet is constantly down with no real explanation of why it's down or when it is coming back up," the district's commitment to technology-integration seems insincere. Participant 3 explained how the "lack of reliable internet connections for the majority of students" has created issues within his own classroom, especially when trying to get students signed onto computers. Participant 9 acknowledged how time

consuming it was to investigate new technologies, attend district-sponsored professional development, and reach out to colleagues about technology-integration. Participant 9 shared that because of the time commitment spent on researching and learning about technology-integration, “I often just give up.” Therefore, the lack of available time throughout the workday for teachers to learn how to use new technology in the classroom and school administrators supporting schedule adjustments for teachers to learn about technology, led to a barriers for technology integration.

Another barrier was the lack of appropriate or applicable professional development from the district. As Participant 7 noted, the district focused on very basic technologies, primarily Google Classroom, which led to redundancy for many participants regarding the content of the professional development opportunities. One participant reported the professional development opportunities through the school district “have been redundant” because these opportunities focus on technologies already introduced. Participant 7 elaborated on this sentiment and reported, “we have the same teacher integrating the same old technology” because “nothing new has been introduced” during the professional development trainings. Participant 7 noted the district was “very slow and not progressive” in encouraging technology adoption.

Participant 4 admitted one major challenge for professional development was the lack of relatedness of the material being taught across all subject areas. Participant 4 suggested that one reason professional development did not specifically pertain to related subject areas was because “it is often driven by administrators subject to sales pitches,

rather than actual needs of the teachers and students." Participant 8 shared similar concerns, stating "the professional development received does not always relate to the content areas" of teachers but did not discuss the potential of how the district did not pick professional development training based on teacher or student needs. Participant 3 suggested the district should allow teachers to choose the professional development opportunities teachers wish to attend. Participant 3 argued that "when teachers are forced to participate in trainings where they have no vested interest, the training becomes less than efficient and a waste of district funds." As a result, "training should be chosen by the individuals" instead of mandatory across all subjects and schools (Participant 3). Participant 6 agreed with Participant 3's suggestion and said the district should emphasize "training that can assist in the field that we are teaching" instead of mandatory attendance."

For one participant the lack of internet connectivity compounded the difficulty of translating the professional development into the classroom. Participant 9 said:

> I often attend the offered training, however [I] often find myself unable to return to my classroom and establish the programs, which I have been taught. At times our internet is limited, time passes before I have the time to use the program and often feel ashamed to invite help.

Finally, attitudes towards technology-integration were the final barrier that participants indicated during their interviews. Participant 9 admitted being "too ashamed to ask for help" with technology-integration in the classroom from colleagues "since many of my

peers are so well training they tell me it's so easy." Participant 9 felt behind colleagues who had a better understanding of technology-integration, which negatively influenced this participant's desire to reach out for additional support. This negative feeling toward technology integration created a negative-feedback loop where Participant 9's inability to master technology-integration made him feel further isolated from his peers. Participant 9 shared:

> With the busy lives we live it's difficult to even take time to learn what might be an advantage to ourselves. I personally need to make time to help myself without being fearful of embarrassing myself by asking for help.

One participant provided some advice regarding technology integration that centered on a lack of fear regarding technology. Participant 4 wanted individuals, either students or teachers, to not see technology as insurmountable. Participant 4 said:

> [It's] important to have no fear of the tech. You just have to dive into it and see where a student might take it. You can not anticipate all outcomes. You have to have the knowledge, but you also have to be flexible and spontaneous. You have to expect some frustration, and you have to accept some outcomes that were not planned. I have always had the personality to do this, and not try and be overly controlling, nor try to totally predict outcomes that might cause educational self-fulfilling prophecies to occur.

Participant 5 elaborated on an important aspect of technology integration, which was the "personal desire to integrate technology." The attitude towards technology-integration

influenced how successful teachers could be in the classroom. Participant 5 explained that because technology-integration was a personal desire: "I did all the research and suggestions for technology in my classroom." While Participant 5 did face challenges regarding integrating technology for his students, he admitted "the only [real] challenge is to get kids to become acclimated to doing something new." With a positive attitude and a willingness to be flexible, technology-integration was possible for every teacher. Nonetheless, as Participant 9 exemplified, being ashamed of not being technologically advanced can negative influence technology-integration in the classroom.

Conclusion and Summary

Section 2 contained a description of the methodology for the proposed study, discussion of the study participants, sample size, and sampling method; measures to ensure adherence to ethical standards; the data collection instruments and procedures; the data analysis process; and the role of the researcher. The qualitative method and case study design were the most appropriate options for achieving the purpose of the study. After I received approval to conduct the study, I recruited 10 participants. The participants were teachers at a suburban vocational high school in the northeastern United States. Each participant participated in a one-on-one, semistructured interview using open-ended questions. The results of this qualitative case study may be used to develop a PD program designed to improve technology integration and, by extension, classroom instruction and student outcomes.

Section 3 discusses the findings and proposes a project that will address the issues after the analysis of the data. Finally, Section 4 is composed of reflective statements from data and conclusions. In addition, recommendations based on the findings are provided.

Section 3: The Project

Introduction

As technology became more of a demand in our schools, the U.S. Department of Education (DoE) mandated that technology be implemented in our schools, which shifted teacher professional development and incorporated technology plans throughout the states (U.S. Department of Education, 2017). Moreover, technology professional development for teachers was also enhanced to subject matter curriculum to make an impact on teacher technology skills and instructional courseware (Wang, Hsu, Reeves, Coster, 2014). This qualitative project study was designed to explore whether professional development focused on technology training would improve teacher skills and impact student learning at a suburban vocational high school. The goal of the qualitative data collection was to provide a detailed view from participants who attended district-wide professional development training on technology use in the classroom. Thus, 10-experienced teacher–participants at the suburban high school responded to technology professional development, which focused on technology integration via an interview (see Appendix D). The data was designed to discover how the participants viewed technology professional development and how they used technology as an instructional tool in the classroom.

The qualitative study results revealed that in the local district, initiatives to learn technology did not enhance the learning of skills and? Transform classroom instruction, due to several entities that inhibited its success. Barriers to technology integration

included the lack of Internet connectivity, no applicable professional development for subject matter, and lack of opportunities to share technology skills with colleagues. Lack of Internet connectivity caused many issues that negatively influenced completion of the assignment. Applicable professional training opportunities were also affected, as the district did not provide training for individual subject areas and the technologies that support teachers were investigated outside the classroom. Participants' described that the lack of time committed by the school to share technology resources with colleagues as a barrier to technology integration. For example, development opportunities from technology training did not include an appropriate amount of scheduled time to complete the assigned activities.

Data analysis informed the production of a 3-day PD seminar (see Appendix A), which indicated the way future teacher technology training should be developed. The PD will address teacher technology practices of several resources used in the classroom (PowerPoint, Google Classroom, Nearpod, and Kahoot). During a demonstration of these tools, teachers will observe how the tools are used and proceed to collaborate with peers on how these tools can be customized for their subject matter. This collaborative process will help teachers support each other during technology integration and implementation plans that will empower teachers to share knowledge and collaborate for effective classroom teaching. During the PD training teachers will also be supplied with an agenda, presentation notes, sign-in sheets, technology survey, and evaluation sheet. Teacher participants will also be given a list of popular technology tools used along with my

professional email for additional support. Additionally, the evaluation sheets collected at the end will assist my evaluation of the training and makes notes for future training needs. The primary goal and benefit of technology training for teachers at the suburban vocational high school is to provide technology training to meet implementation plans required by the DoE.

Rationale

Technology is a major tool used in 21st century schools that supports teaching and learning (MacCallum, Jeffrey, & Kinsuk, 2014). Schools now have to prepare students for 21st century careers where the traditional model of sitting for lectures no longer exists (Cakir, 2012; Luterbach & Brown, 2011). Technologically savvy students are often better prepared to get a job and excel in their careers (Savage & Brown, 2014). However, according to Pittman and Gains, (2015), "the task of integrating technology into classroom instruction in a meaningful and state-of-the-art way remains challenging" (p.13). Therefore, teachers need to learn to integrate technology use into their classrooms effectively and meaningfully to support students' future success, and professional development needs to provide practical resources that help teachers overcome barriers to effective technology integration in classrooms.

The qualitative project study was designed to explore effective technology professional development to support technology integration in a suburban vocational high school. A thorough analysis of the literature provided justification for the inquiry to this study. Teacher technology competence is important to the school and student learner to

build a higher standard of performance. This need for competency led researchers to study how teachers learn, develop, and grow (Davies & West, 2013). The qualitative data collected for the present study were used to quantify the problem and provide grounds for improved technology professional development. Gathered perspectives and thoughts about technology integration via professional development training in the school district were used to inform the newly designed professional development opportunity.

Professional development was chosen because of the goal to improve technology integration based on DoE mandates. Teachers are the vessels to student achievement, and classroom teachers are the most important factor for improving student's performance (Hawley & Valli, 2007). In addition, content-specific training is a key element in creating teacher effectiveness in schools (Darling-Hammond, 2010). The project study is appropriate to support barriers to technology integration professional development designed to improve implementation to the study site.

The interviews revealed participants' views on the interest to create a professional development program where the activities would be tailored to their individual needs. Therefore, Appendix A provides a 3-day PD training presentation, based on participants' perspective on technology professional development practices in the suburban vocational high school. The PD training will allow teachers to work on technology skills in a collaborative way to share information amongst each other. Through collaboration, teachers will share their learned skills and develop content-specific mastery for their technology use in the classroom. Teachers will then be offered a technology activity that

help grow, develop, and support technology skills and instructional practices. This will include an optional follow up technology club, so teachers can create a space that engages and support teachers to collaborate and share technology related tools and resources. The technology club will create a newsletter to share resources and best practices for technology use in the classroom. In addition, the technology club will allow teachers to stay current and be prepared for future technology tools.

Review of the Literature

Resources for the literature review were identified through the following databases, ERIC, SAGE Premier, ProQuest Central and Google Scholar. Keywords included the following*: teacher technology development*; *effective professional development*; *effective teacher training*; *technology* AND *teachers*; and *effective teacher collaboration*. Teacher attitude and concerns were outlined to support the need for collaborative training that results in teachers' improved skill and enhanced classroom instruction. The literature review also contained theory on the history of technology and the mandates that school districts should abide regarding technology implementation plans and how the learning would not only improve teacher skills but also prepare students in the 21st century.

Technology Integration

In the digital age students are required to research, use information, and communicate successfully with technology. These types of digital skills are developed

through instruction that permits students to be active, innovative and responsible for learning (Konokman & Yelken, 2016). The Elementary and Secondary Act (ESA) mandates technology integration in schools for all subject matter areas, including reading, mathematics, and special education (U.S. Department of Education, 2017). The goal of the ESA legislation was to support students becoming technologically savvy, and that technology be established to improve instruction. In addition, under the ESA, teachers were encouraged to learn and develop technology skills to broaden instructional strategies more effectively. A government mandate for teacher technology use in the classroom provided an enormous task in the United States for Grades K-12 school curricula developers and teachers (National Education Technology Plan Update, 2017).

Studies show several benefits of incorporating technology in the classroom: (a) create hands-on and meaningful lessons (Spaulding, 2013), (b) increase student motivation and engagement (Mustafina, 2016; Rabah, 2015; Sabzian, Gilakjani, & Sodouri, 2013), (c) maintain mastery of skills (Vajravelu & Muhs, 2016), (d) increase academic confidence in students (Costly, 2014), and (e) allow time for students to enhance their technology skills and educational performance (Nwoobi, Ngozi, Rufina, & Ogbonnaya, 2016). Technology instruction transforms teaching through careful selection of technologies used and the need to identify teaching goals and practices (Kimmons, Miller, Amador, Desjardins, & Hall, 2015). Students will adapt to transformative learning when information is obtained but also when thoughts, feelings and beliefs are transformed (Mirela & Hellen, 2015).

However, teachers must learn to incorporate the technology effectively to enact the benefits of improve technology skills that add value to course of study (Miller et al., 2015). There are barriers that are both extrinsic (relating to infrastructure) and intrinsic (participant beliefs and attitudes) (Vatanartiran & Karadeniz, 2015). The needs of the school were indicated by the findings in the present qualitative study. The literature review includes research that develops the need for the professional development designed for the present project study.

Project Development Design

The PD designed for this project study was designed based on research regarding how teachers learn and adapt to technology using a collaborative model of learning (Kleickmann, Trobst, Jonen, Vehmey, & Moller, 2016). Because of the demand for technology in the classroom, schools are tasked with providing professional development that will lead to increased technology use in the classroom (Darling-Hammond, Hyler, Gardner, & Espinoza, 2017). Under the ESA, several guidelines serve as fundamental beliefs for instructional technology: (a) improved learning through the lens of technology integration and (b) students will meet industry standards with technology skills that prepare them for the global economy. Technology integration is defined as "having access to computers, computer software, and the Internet, which led critics to identify the mandate to integrate technology into schools as a simplistic solution to complicated endeavors" (Buss, Wetzel, Foulger, & Lindsay, 2015, p. 162). Nevertheless, technology implementation is in line with constructivist teachings regarding education. Specifically,

Dewey (1899) produced a discipline named the American educational philosophy with the publication of *The School and Society* and then in 1929 published *The Child and the Curriculum.* Dewey (1938), through his constructivist theory, conveyed that teachers could connect with instructional curriculum to create a classroom environment that will motivate and expand student learning.

However, there was a gap between the requirements of the DOE mandate and actual classroom practice. According to Bolkan (2017), approximately 78% of teachers responding to an online survey indicated that they had not received training that helped them to effectively implement technology in their classrooms. Mouza et al. (2017) suggested that limited technology use (Google classroom, project, and smart board) in the classroom was due to shortages in teachers' professional development. Data results from this study revealed that participants used Google classroom, projectors, smart boards, and PowerPoint to manage classroom functions. One of the participants in the project study also indicated that the Internet is used to manage classroom instruction and other technologies in the classroom because there was limited training support and people felt shame asking for help. Therefore, there seemed to be barriers to action that limited technology implementation, particularly regarding teacher preparation. As a result of this project study, teachers should receive effective quality technology professional development that will impact teachers' technology development and have the ability to incorporate effective technology instruction into the classroom (Randel, Apthorp,

Beesley, Clark, & Wang, 2016). This data informed the creation of an improved PD intervention for technology integration.

Research exists regarding effective professional development for teachers in the classroom (Whitworth & Chin, 2017). Teachers are able to be creative with technology resources to teach curriculum materials with technology if professional development is adequate (U.S. Department of Education, Office of Educational Technology, 2016). Teachers benefit from environments of learning that are student-centered and content-specific; particularly, teachers learn better when technology professional development met teacher needs and were relevant to curriculum (Chavis & Kim, 2015). Therefore, the PD designed for this project study included opportunities for teachers to develop practical lesson plans and get feedback from fellow teachers and me. Through this tailored approach teacher peer collaboration and added technology tools, it was hoped to provide PD that could lead to teachers' to action.

Effective technology development would improve classroom training and teaching to improve the future of student achievement. Educators should engage in consistent professional development to improve their skills in technology (Williams, 2017). Teachers who participate in professional development should monitor their training needs and review personal goals on a consistent basis (Tooley & Connally, 2016). Teachers must reflect on the learning goals and outcomes due to the possibility of contributing to the technology plans. According to Ronfeldt, Farmer, McQueen, and Grissom (2015), teachers who change teaching practices after training and focus on

providing instruction strategies that enhance student outcomes used authentic activities with technology to increase student learning. The activities developed in the second day to research technology tools, and add technology to subject matter content teachers were able designed to transfer the learned skills directly into the classrooms.

One important element of the planned PD training is teacher collaboration in the professional development opportunity. The literature review in Section 1 indicated that technology integration improvement would incorporate collaborative professional development for teachers (National Education Technology Plan Update, 2017). Effective teacher collaboration benefits technology training when hands-on activities are practiced among teachers (Desantis, VanCuren, Putsch, & Metzger, 2015). The collaborative teacher training efforts of change would implement technology integration will engage students and prepare them for the changing workplace (Wang, Hsu, Reeves, & Coster, 2014). Attending PD training where a community of learners is joined together in a collaborative community helps to build new strategies and confidence that enable effective instructional practice (Foley, Khoshaim, Alsaeed & Er (2011). Therefore, collaboration with other teachers formed the core of the PD training designed for this project study.

Another important element of successful technology integration is effective, supportive leadership (McLeod, 2015). Alignment of the schools' goals with PD include: (a) strong commitment of managers for developing staff, (b) alignment of professional development with performance standards, and (c) adequate resources for effective

training (Daresh & Alexander, 2015). In addition, school leaders will provide training and support for teachers and assist with technology integration improvement (Daresh & Alexander, 2015). For this reason, and based on the findings regarding implementation barriers in the qualitative study, I have involved school leadership in the planning and development of the PD training.

Project Description

Needed Resources and Existing Support

The suburban vocational high school in this study has technologies available to help ongoing teacher training and support. However, the participants acknowledged lack of support after the technology workshops were completed. Teachers need support to integrate technology into classroom instruction. The PD training will require an effective location that enables collaboration among participants. Therefore, participants will meet in the media center at the vocational high school. Resources needed for the PD training are good access and connectivity to the Internet, online resources, video clips, and a variety of technology devices. The devices include computers, digital projector, and smart board. If desktops are not available, a laptop cart is acceptable. The technology team at the school will be notified to be available for setup requirements for non-interruption of network issues. Coffee, tea and light breakfast food will be ordered and setup. Maintenance will be notified to prepare the room with trash dispensers, and office staff will be informed about the time and location of the PD training. Administrators will be allowed to enter training room during breaks or any other time as deemed appropriate.

The school administrators and the administrative office workers will help guide and inform participants during the professional training. Prior to PD trainings, the administrative team will receive a memo outlining specific needs (e.g., food budget, room location, technology support, maintenance, scheduled dates according to professional development dates, and student early dismissal days). For past professional development, the administrative team has provided similar support, so processes are in place for receiving support for the planned PD training.

Potential Barriers and Solutions

"Technology is an essential life skill in the workforce and students are essentially in need of technology skills that are meaningful" according to Savage and Brown (2014), (p. 13). However, the participants in this study cited challenges to implementing technology such as: poor infrastructure, inadequate technology, lack of sufficient technology tools, lack of effective professional development, and low teacher self-efficacy. Therefore, the study revealed remaining barriers to effective interventions that I will consider in implementing the PD training.

One primary barrier is teacher buy-in. If the training is voluntary, a small amount of teachers may not take advantage of training or feel they do not need training. This optional nature of the training could result in a smaller number of teachers using the technology tools. However, teachers need professional development hours and continuing education units according to teaching profession contractual agreements, so the training

would be more successful and agreed on by teachers for the training if this credit is emphasized.

Scheduling the training might be another barrier to successful implementation as district professional days may conflict with district administrators' professional development days required. If the scheduling becomes a challenge, then I will provide training after school and change the scheduled hours to 2 hours instead of 3 hours. Alternatively, I may provide the training during district scheduled professional development days as determined by the school district administration. I will consistently communicate with participants as the sole presenter regarding any scheduling changes.

Implementation

The qualitative project study includes a 3-day presentation/PD training that focuses on methods where teachers will build technology skills and support in a collaborative manner that build skills and remove barriers. The proposed schedule for the PD training will include: 3 full days of training that will include expert presenters from Google Classroom, Kahoot and Nearpod. During the PD training periods, I will be available to support the participants as needed. A sample schedule for the proposed PD training is:

8:30 – 9:00	Continental Breakfast
9:00 – 10:00	Introduction and Workshop Objective
10:00 – 11:00	Technology Integration and State Requirements
11:00 – 11:15	Break
11:15 – 12:15	Discussion/Feedback Session
12:15 – 1:00	Lunch Break
1:00 – 2:00	District Administrator: Presentation on teacher evaluation process for technology plans.

2:00 – 3:00 Video: Time Matters: Teachers Collaboration for Learning and Leading.
3:00 – 4:00 Group participants for technology activities - next day workshop.

This professional development project is designed to offer collaboration among teacher participants to use hands-on activities to help solve the training issues discussed and noted by each participant in this study. Participants will use a variety of technology tools, such as Google Classroom, Kahoot, and Nearpod, and design content-specific, technology rich lessons that will be demonstrated and shared among their peers. The initial presentation will focus on the interview results from the participants in the study from a PowerPoint presentation. Technology integration importance will be discussed on the value of using technology in the classroom. Hardware and computer setup requirements will be demonstrated to assure successful set-up in teams. Participants will complete a survey handout of training needs and technology needs, and what technology they currently use, if any.

Next, basic technical issues will be discussed and demonstrated to help teachers solve technology problems they may encounter. Demonstrations of projector setup, computer booting, and Internet connectivity will be performed. Then, participants will be grouped together to create a scenario of a computer/hardware problem to solve. This activity provides group learning and immediate feedback.

On the Day 2 of PD training, the theme will be Tech Tools Day, where teachers will be led by expert technology leaders who will provide a day full of information and

best practices for technology use. Grouping by discipline and technology user levels will be done to prepare for day three work.

On Day 3, participants will begin to collaborate on building technology skills and lessons for classroom instructional practices. Teacher participants will present a lesson and demonstrate technology integration in one of the shared technology tools followed by collaboration with the group to share the lesson. These collaborative hands-on activities will enable participants to share lessons, share ideas, and give constructive feedback to one another.

Implementation Timeline

The professional development training will require meeting with school administrators as well as district curriculum development administration to schedule the proposed PD training on technology integration. During the meeting with school administrators as well as district curriculum development administration, an outline proposal of the PD training will be presented, with an agreement that the full PD training presentation with handouts will be forwarded to the administrator at the end of the year for review and board approval over the summer months. The proposed timetable for the PD training will begin during the academic school year. The PD training will occur during district scheduled professional development days or on early dismissal days during the school year.

Roles and Responsibilities of Student and Others

Some key responsibilities for administrators and the technology department are required for the project. The school administrator is responsible to identify and confirm dates of the technology dates and secure the media center or labs. The technology department will be informed and required to maintain and secure Internet access and connectivity needs.

As the presenter of the PD training, I will provide all of the training materials, handouts, presentation, and access to online videos. Participants will be selected based on their professional development attendance and technology needs, then after other teachers as needed. I will provide a sign-in sheet to track attendance and each participant will receive a certificate at the end of PD training. Supportive measures will be administered during the year using learning communities who meet monthly. During these times, technology concerns will be discussed and demonstrations of new and used technology tools were collaborated among the groups.

Project Evaluation Plan

Project study results and the intended goals are the basis of the evaluation for this study. The definition of the evaluation process in education is to measure comparisons to established goals (Thamhain, 2015). The evaluation of training outcomes is important to assess future professional development improvements or needed changes for programs to provide a systematic way to assess and validate training (Williams, 2017). Professional development has several levels of evaluation: (a) participants' reaction to the material, (b)

participants' level of knowledge and skills, (c) availability of immediate and ongoing support, (d) participants ability and willingness to implement newly acquired knowledge, and (e) participants' confidence in using new knowledge and skills (Guskey, 2014).

To evaluate the PD, I will provide an evaluation tool to encourage suggestions and recommendations for future technology training from each participant. Evaluation forms will be provided at the end of each training session, which will provide feedback from teacher participants. The evaluation will provide necessary information for future training needs and support. In addition, I will be a point of contact to support teachers with technology concerns. After weeks of training, teachers will be given a survey form to validate their use of technology in the classroom and a check-in on practices. The National Education Technology Plan Update (2017) indicated that increased technology use ensures better integration and teacher performance by thorough evaluations. The final stage of observation of technology integration will be the level of technology integration used in the classes at the suburban vocational high school.

Project Implications

The local problem of this study was the limited use of technology in the classroom and inadequate teacher technology skills due to ineffective professional development. To enhance technology use and improve implementation, PD training has been created to enhance the use of teacher technology skills and improve classroom instruction. Successful implementation of this project study will improve technology

implementation at the suburban vocational high school as well as other core content areas at the high school and beyond.

Federal mandates require technology integration support for every school and increasingly the number of teachers using technology is important in the 21st century (The National Educational Technology Plan Update, 2017). Classroom technology use improves student learning and engage them in problem-based learning and access to information around the globe (Collins, Hall, & Taylor 2015). It benefits students to become more competitive in the learning process.

Far-Reaching

Research of professional development programs is designed to communicate research results to federal, state and local stakeholders to share instructional tools for teachers (Duty & Kern, 2014). The documentation of research results will provide vital information to design effective professional development for using technology in the classroom. Learning experiences that involve technology are becoming the norm for today's student, and educators have been advised to integrate technology into classroom instruction (Henrie, Halverson, & Graham, 2015). Implementation is encouraged because technology forms a learning environment that is creative and stimulating (Henrie et al., 2015). As society grows in its use of technology, it is expected that education will continue to grow in the usage of the tools as well, and students become more technologically savvy and reach the expectations of the modern workforce.

Recommendations for Meaningful Technology Integration

Effective technology integration begins with a focus on educators as the means of transcending information to students in the 21st century. The investment of technology for supportive learning creates a diversity of training for all educators, but the one-size fits all approach to improving teachers' technology integration skills fall short of effective technology-based training.

Coaching presents an opportunity for teachers to work with one another for technology training that involves mentors guiding educators who are less experienced with technology integration (Oliver & Townsend, 2013). Professional learning communities allow educators to work collaboratively together to study technology and learn from each other as provided by the National Education Technology Plan Update, 2016 (Oliver & Townsend, 2013). The NETP grant influences shared values, collaboration and mentoring to determine the effectiveness of technology integration and training.

Collaboration. Moral (2014) and Suh and Seshaiyer (2013) label collaboration as an essential twenty-first century skill that support professional learning that is enhanced by collaboration among peers. With the experiences and innovations in technology advancements educational technology has rapidly changed within the last decade (Kumar & Dawson, 2014) Working with collaborative groups create dynamic creativity, improvement of reflective practices, increase mutual respect and promote team achievements. Therefore, collaborative groups will endure increased self-efficacy (Morel, 2014). In a study by Kang (2016), the focus on collaborative relationships means that

teachers will result in greater professional growth. Collaboration is an effective learning strategy that is important in a global society (Morel, 2014). Practicing collaboration display the importance of teamwork as teachers, students and administrators prepare for the future.

Conclusion

Section 3 presented a description of the project study and the analysis of the data results as required. Participant concerns and interview results were shared regarding their technology experiences. I believe the proposed technology training development provide applicable training for effective use of technology as an instructional tool. Section 4 presents final results, implementation plans and my personal reflections.

Section 4: Reflections and Conclusions

Introduction

This section addresses strengths and limitations of this project study along with my personal reflections on the scholarly process. Also included are the development of my scholarly growth and the development of what exactly? And potential social change that would impact other schools. Recommendations for future research inquiry in addition to implications and applications appear at the end of this section.

Project Strengths and Project Limitations

The strength of this project was addressing teacher technology development at the high school, which communicated participants' perceptions and recommendations to improve technology support, training, classroom instructional practices, and removal of barriers. This qualitative project was written with a focus on technology integration, and teacher development to affect student achievement. Strengths of this project included (a) teacher perspectives, collected through interviews regarding technology professional development, (b) skills, and (c) their knowledge of technology instructional practices. Information from the Department of Education was provided to support the need for technology integration and teacher technology development. The data collected informed the professional development workshop, and thus may increase teachers' likelihood of making changes based on the intervention. The project study is flexible to accommodate the entire school year's demands for professional development requirements.

The main limitation of technology implementation plans was addressing teachers who were less likely to engage in technology initiatives and therefore did not accept the project study with a sign of positive support. Teacher mind-set is essential to this project and to the success of technology initiatives in our schools. Observations of peers and an open-mind are essential. Through modeling, with a space for new ideas, positive feedback will help develop teacher skills (Gerstein, 2014). The scheduling of the project study may be a challenge due to the school-wide professional development schedule. However, this project is flexible enough to schedule half-days or two-hour sessions during the school year.

Recommendations for Alternative Approaches

This study addressed teacher technology professional development skills and experience at a suburban vocational technical high school. The project focused on teacher perspectives of current technical professional development and their attitudes towards technology integration in the classroom. Current professional development training needs to be in alignment with teacher needs to successfully integrate technology into instructional practice. Although technology integration is mandated by the state, teachers are still unclear about how to use technology for instructional purposes. Research findings from the present study indicated that professional development opportunities, and common planning periods are the best approach to improve the quality of technology initiatives for the vocational high school teachers. Mentoring with groups of teachers would also be a great value to address the problem at the vocational high school. The

option chosen for the present study was a 3-day professional development workshop supporting technology integration learning. Additionally, as teachers discuss the idea of embracing technology PD more effective training will be supported. The project study will become more popular with more teachers accepting the district initiatives and instructional plans. Teachers will become more accepting of the study. One-on-one work and group meetings are additional approaches, aside from mentoring may provide additional training support to participants who struggle with technology initiatives and help to meet the goals for the school district. Mentoring provides teachers with an effective approach to be successful among new teachers and benefits the mentor teacher to enhance instructional skills (Jones, Tones, & Foulkes, 2018). A teacher-mentoring program should emphasize teacher efficacy to promote successful student learning. Additionally, a teacher-mentoring program can utilize sub-groups of activities for teachers' technology empowerment; for example, schools could create a technology club where new and used resources can link to school district demands an provide a clear path to technology instructional planning where meaningful feedback, and support is made available through the mentoring programs and additional clubs teacher may develop.

Scholarship, Project Development, Leadership, and Change

Being a student at Walden University has been a life-changing opportunity to develop as a research scholar. The course discussion posts allowed me the opportunity to engage and communicate course content, but also to effectively analyze information. When I began to think about my dissertation topic, I interacted with classmates and my

chair to help encourage me and provide mentoring through the process. It was quite a positive collaboration of great beginnings when I was introduced to my chair Dr. Maureen Ellis, whose guidance and support have helped me get to this point. In addition, all of my committee members assisted in my growth throughout my project study. I am hopeful that the collegial relationships we have developed will continue to foster long after my doctorate degree.

The role of a scholar is to study and research information on a specific topic and to be able to analyze the information through data. In this role as researcher, I have gained a greater understanding of scholarly research and how to analyze researched data. In-depth research is required to meet scholarship requirements Through my research I have learned how to research literature and work on the process to improve my educational career and how it will be a consideration for present and future research resources. Additionally, abstract thinking and discovery to cover various topics for research revealed needed resources from peer-reviewed literature.

By completing this study, I enhanced my skills, critical thinking and encouragement, which will transfer to my ability to provide effective education for my students. Throughout my experience working on this project study, I have been inspired to continue this work in technology integration and implementation. The professional growth has led me to participate in additional school projects that align with higher student learning as well as teacher technology experiences. I am now ready for full-time college level teaching to create positive social change.

My experience as a former corporate technology trainer and 20 years as a teacher and adjunct professor provided me the ability to design this project study that sought the perceptions of teachers' development in technology training and classroom instruction. Spending many years in teacher professional development workshops and also discussing PD outcomes for teacher development in communities of learning with colleagues helped me to grow in the area of teacher development in technology. The focus of the design was to adhere to the needs of both beginner and experience technology users.

My role as an educational leader and development of this scholarly project has helped me to be ready and focused on educational issues and the roles of teachers, student and parents. Aligned with Rogers (2003) diffusion of innovation theory, which endorses the ability to share relationships between users to facilitate the awareness of technology needs, I am motivated to provide guidance and demonstrate effective use of technology and to share my expertise with teachers in classroom instruction. Sharing of knowledge is to encourage participation to accommodate growth and change. Through the continuation of reading, research and professional development, I feel confident that I can assist teachers in attaining the essential skills to effectively design rich lessons in technology to enhance learning.

Further, the ability to research technology-related materials for teachers use in the classroom has impacted the teachers and the school I support to assist in facilitating technology initiatives and take part in current professional development workshops that build teacher skills in technology initiatives. As an educational leader, I share my

experiences and expertise in classroom teaching and instructional strategies through collaborative discussions in meetings with colleagues and other educational professionals. The effects that my research will have on social change will reveal an increase in growth and development of teachers' technology skills and communities of support for the future of technology integration in our schools.

Reflection on the Importance of the Work

The results of this qualitative project study will have a strong impact on teachers' technology PD development at the vocational high school. Professional development training in technology will supersede the former PD training, which according to the research data analysis of this study was not effective. This project study will support both new teachers and veteran teachers to integrate technology as an instructional tool. This PD training includes sessions focused on technology becoming a teaching tool and teachers more proficient in technology use. The study will effect social change in the local and wider educational settings as teaching and learning meets the need of the 21st century learner in a technological society. The intentions of the project study will increase technology for teachers at the suburban vocational high school and create a broader PD training for other school districts.

Implications, Applications, and Directions for Future Research

Just as the research for this qualitative project study influenced the technology PD training developed for this project, it can also be used on a permanent basis to meet the

needs of teachers in the school. Furthermore, the basic findings can be used to develop PD throughout the district and other school campuses around the state.

If teachers will use and share their technology experiences with their peers to increase technology integration, then teachers will participate in the quest to learn technology as an instructional tool. It is my hope that, by addressing their perceptions and concerns regarding technology, buys in will be greater. Feedback from the teachers and subsequent participation in the technology club will reveal whether addressing their concerns increases buy in.

Further research may assess how technology integration affects student achievement. The data results may perhaps be a quantitative study that yields numerical data, which show an increase, or decrease in student achievement after technology integration. Additionally, researchers might investigate whether concerns are similar at different schools, and use this information to target the needs of their teachers. Through this kind of evidence-based practice, schools may be able to address issues with technology implementation in the classroom.

Conclusion

This project study was designed to address the concerns of participants at the suburban vocational high school via an interview and data analysis. The results of this project study will be presented to school administrators the concerns and perceptions of teacher participants. This qualitative project study will impact research on teachers' perceptions of technology integration as an instructional tool. Participants in this study

were excited to take part in a topic of major concern to the future of educational learning goals and student achievement. Because of this study, participants in the PD training will learn how to meet the federal and state mandates for technology implementation plans for schools in our society. Teachers will therefore have a positive outlook on the technology professional development plans that leverage the power of teaching and learning.

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Appendix A: The Project

EFFECTIVE TECHNOLOGY TRAINING

FOR TEACHERS

2019

Introduction

This technology-training workshop is designed to help teachers understand useful and effective tools for classroom instruction. The plan was developed based on data analysis of qualitative interviews with teachers about their technology use and incorporates recommendations to improve technology skills in the classroom.

Purpose

The goal of this training is for teachers to acquire technology skills that promote technology integration in their subject matters to prepare students for 21st century. Each of the activities in this workshop is planned according to the interview data and participants' perspectives on technology integration concerns. The demonstration of what effective technology integration looks like in the classroom will be shared and collaborated via research-based strategies. Websites and resources will guide the training so participants will observe effective use of technology.

For this workshop, collaborative group work will be emphasized to build technology instructional tools for classroom use. Hammond, Hyler, Gardner, and Espinoza (2017) stated, "As schools have increasingly structured teaching as a collaborative community endeavor, it makes sense that teacher collaboration is an important feature of a well- designed training development" (p.9). The goal is to create a community and foster learning about technology integration in a practical, effective way.

Intended Audience

The intended audience will be teachers at the suburban vocational high school who have the desire to improve technology skills for classroom instruction. This project will benefit the growth in technology for 21st century skillsets and meet the demands of a global economy that is driven by technology initiatives.

Technology Instructional Workshop Tools

WORKSHOP OBJECTIVES

Day 1, 2, and 3: Working with Technology

Time: 3 Full Days

Objective: By the end of this training, participants will be able to:

- Identify a variety of technology tools for technology integration
- Create/Design lessons using technology tools.
- Collaborate with colleagues on the process of technology use in the classroom.
- Review existing technology to observe and customize to subject matter use.

Training Materials & Resources

- Media Center
- Handouts
- Desktop Computer/Laptops
- Internet/Network Connectivity
- Printer

Darlene Morrison, Instructor

TECHNOLOGY INSTRUCTIONAL WORKSHOP
DAY 1—What Is Your Story?

- ⇒ **Students will sign-in**
- ⇒ **Instructor and students' introductions (students will give expectations)**
- ⇒ **Students will complete technology survey**
- ⇒ **Instructor will give a briefing about the PD and what is gained by teacher attendance and technology skills learned.**
- ⇒ **Describe each day of events as follows:**

To meet the challenges of technology integration and the limitations of effective PD that support technology initiatives, this PD workshop is designed to help you:

Gain knowledge: that will not only help you, but also enhance your classroom instructional practice to provide the necessary skills for successful student outcomes.

Use Technology resources for the classroom: review of several technology tools useful for classroom instruction.

Work collaboratively with peers in technology learning: participants will work together in groups to discuss technology skills and embrace technology

AM

- ⇒ **Show PowerPoint Presentation**
- ⇒ **Teacher technology evaluation process by district administrator**
- ⇒ **Establish groups by discipline for debriefing and feedback- 15 MINUTES**
- ⇒ **Video: An Introduction to Technology Integration**
  https://www.edutopia.org/video/introduction-technology-integration

WHAT HAS BEEN YOUR BIGGEST FEAR/CONCERN ABOUT THE USE OF TECHNOLOGY?

PM:

- ⇒ **GROUP ACTIVITIES DISCUSSION- 1 hour**
  - o **Discuss current best practices**
  - o **Gaps in current practices – Think-Pair-Share**
- ⇒ **Select one person from each group to share a reflection – 15 minutes each**
- ⇒ **NJ State requirements for technology integration by NJDOE presenter**

Day 1

Sign-In Sheet

Name	Position	Dept.

Teacher Technology Survey

The survey is designed to help identify teacher-training needs and check skill level. Please complete each question below.

1. How often do you use technology in the classroom? (Circle one selection)
    a. Daily
    b. Three or more times a week
    c. Sometimes
    d. Rarely

2. Are you prepared to help students achieve technology skills to meet 21st century implementation plans?
    a. Yes
    b. No

3. What types of technology tools/resources are you familiar with? (Circle all that apply and add if needed)
    a. MS Office
    b. Digital Projector
    c. Laptop Computer
    d. _____
    e. _____
    f. _____
    g. _____

4. What technology training would you find most helpful?
    a. _____
    b. _____

DAY 2 –TECH TOOLS DAY

AM

- ⇒ **Sign In: Instructor Recap Day 1**
- ⇒ **Discussions and Feedback Session**
- ⇒ **Video: Time Matters: Teachers Collaboration for Learning and Leading**
- ⇒ **15 Minute Break**
- ⇒ **Presenter: Google Expert Demonstration**

PM

- ⇒ **ACTIVITY: Experiential Learning Session – 1 hr.**
  - **Teachers will login to Google and Experiment using tools**
    - **Classroom Setup**
    - **Creating Assignments**
    - **Review use of Grading and Student Setup.**
- ⇒ **Teachers will share and reflect on learning session – 15 min.**
- ⇒ **Presenter: Kahoot Expert Demonstration**
- ⇒ **Introduction to Lynda.com website for technology resource tools.**
- ⇒ **Presenter: Nearpod Expert Demonstration**

DAY 2 –TECH TOOLS DAY
Sign In Sheet

Name	Position	Dept.

TECHNOLOGY INSTRUCTIONAL WORKSHOP
DAY 3

AM

⇒ Student Sign-In

⇒ Instructor will review Day 1 and Day 2

⇒ **ACTIVITY**: Kahoot NAME THAT TOOL?

⇒ Participants will login to Kahoot and respond to examples of use (by phone, pc, etc.)

⇒ Break – 15 min.

⇒ Review of Google Classroom by Expert presenter: (Setup, Student Access, Assessment, and Forms)

⇒ **ACTIVITY:** Teachers will login and practice use of Nearpod – 1 hr**.**

⇒ **ACTIVITY**: Master Users and Novice Users - Think-Pair-Share for feedback and comments - 15 minutes

PM

⇒ **ACTIVITY**: Master Users and Novice Users will be grouped to prepare lesson plans and assessment process in Google Classroom– 1 hr.
- One person from each group will share lesson created

⇒ Discussion and recommendations on resource – 15 minutes

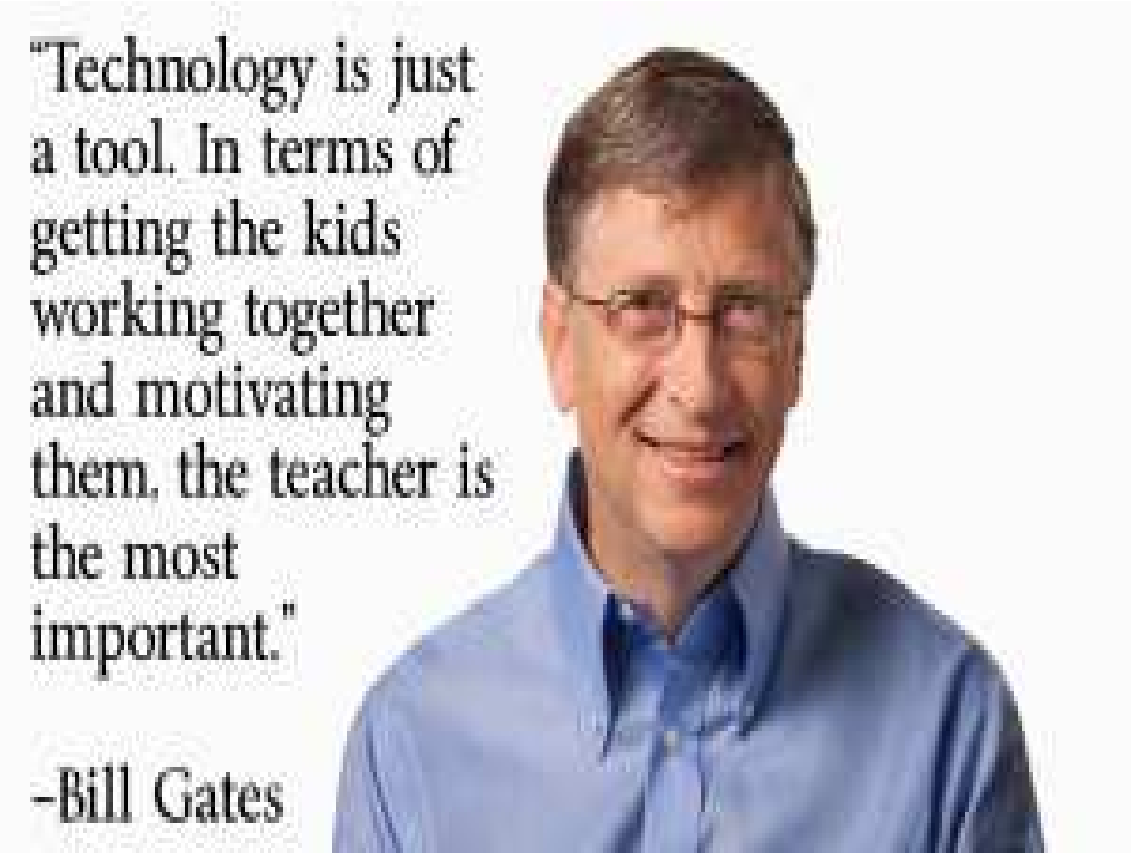
⇒ **ACTIVITY**: Group students by discipline to select a technology tool (from tech handout) and create a lesson along with assessment -30 minutes.

- One person from each group will share feedback.

⇒ **ACTIVITY:** Teachers will select a technology tool and create a lesson plan.
- Each will share lesson

⇒ **WORKSHOP EVALUATION**: Students will complete evaluations at the end of class.

⇒ Instructor contact information will be provided for additional support and questions.


"Technology is just a tool. In terms of getting the kids working together and motivating them, the teacher is the most important."
-Bill Gates

Technology Workshop Training Evaluation Form					
	Strongly Agree (5)	**Agree (4)**	**Neither Agree nor Disagree (3)**	**Disagree (2)**	**Strongly Disagree (1)**
The training content was well organized and informative					
The instructional objectives were clearly defined.					
Sufficient materials were available and relevant.					
The training inspired me to integrate technology.					
Difficult concepts were illustrated effectively					
The facilitator was knowledgeable and effective.					
I will be able to use the knowledge gained today.					
The facilitator responded to my questions professionally.					

The facilitator was prepared and organized					
Overall, the training was very effective.					

Additional Comments:

Technology Instructional Workshop
Day 3
Sign-In Sheet

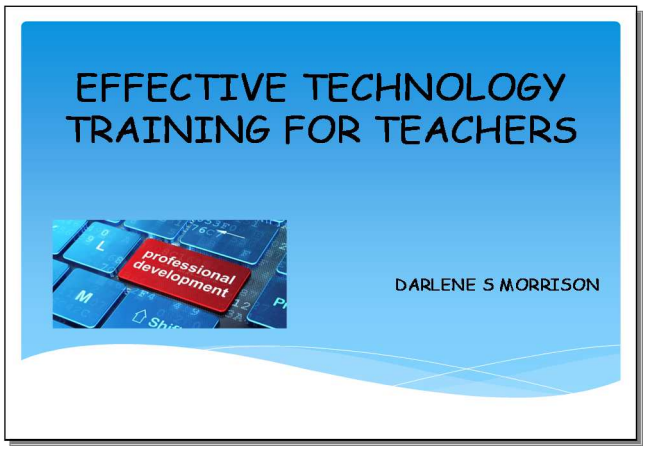
Name	Position	Dept.

TECHNOLOGY RESOURCES		
Google Classroom (https://classroom.google.com	BrainPOP (www.brainpop.com)	Glogster EDU (https://edu.glogster.com/login
Discovery Education (www.discoveryeducation.com)	ePals www.epals.com	Storybird (http://storybird.com)
Microsoft Office (Word, Excel, PowerPoint).	Go! Animate (https://goanimate.com	Edmodo (http://www.edmodo.com/)
Khan Academy (www.khanacademy.org)	Jigsaw Classroom (www.jigsaw.org)	Bitstrips for Schools (www.bitstripsforschools.com)
MathBoard (www.palasoftware.com/mathboard.htm)	Math Playground (www.mathplayground.com)	Kidblog (https://kidblog.org)
Prezi (https://prezi.com	Promethean (www.prometheanworld.com)	DK Instant Expert (https://www.teachervision.com/)
Mindmeister (www.mindmeister.com)	TeacherTube (www.tachertube.com)	KaHoot (https://getkahoot.com)
MyHistro (www.myhistro.com)	SchoolTube (www.schooltube.com)	Poll Everywhere (www.polleverywhere.com)
SuveyMonkey (www.surveymonkey.com)	SmartBoard (https://education.smarttech.com)	Newsela (https://newsela.com)
Socrative (www.socrative.com)	CollaborizeClassroom (https://library.collaborizeclassro.com)	Nearpod (https://nearpod.com)
The Differentiator (http://byrdseed.com/differentiator/\)	ReadWriteThink (www.readwritethink.org)	Brickflow (http://brickflow.strikingly.com/)
Vimeo (https://vimeo.com)	Gnowledge (www.gnowledge.com)	SeeSaw (http://webseesaw.me/)

Formative (https://goformative.com)	LessonCat (www.lessoncast.com)	Remind (www.remind.com)

Day 1 PowerPoint Presentation

Slide 1



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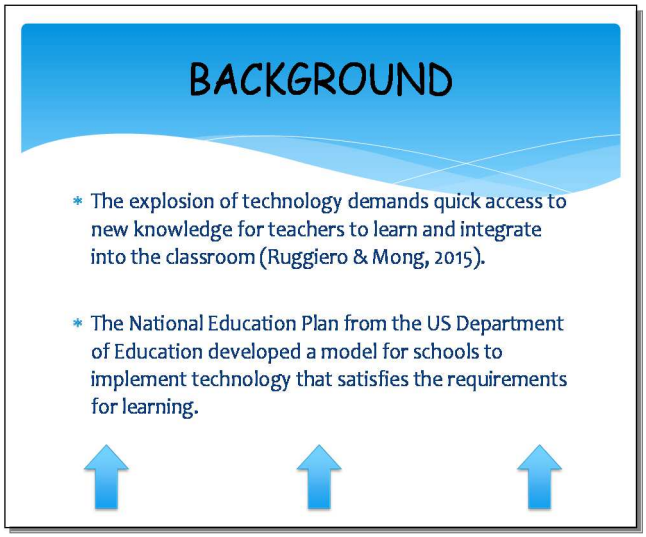

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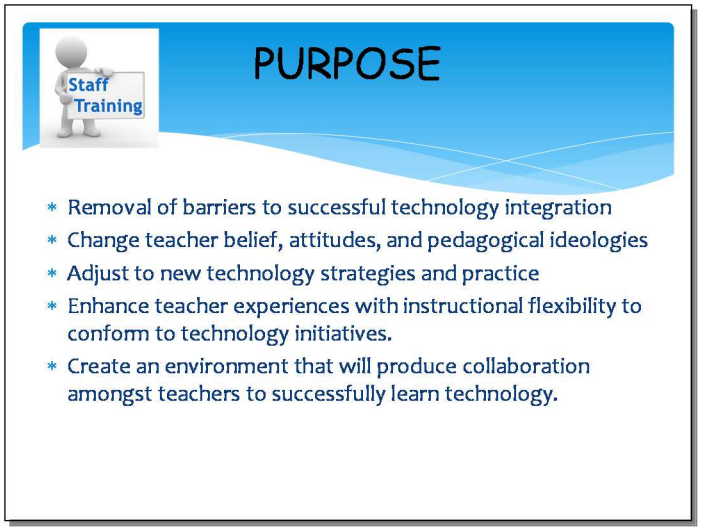

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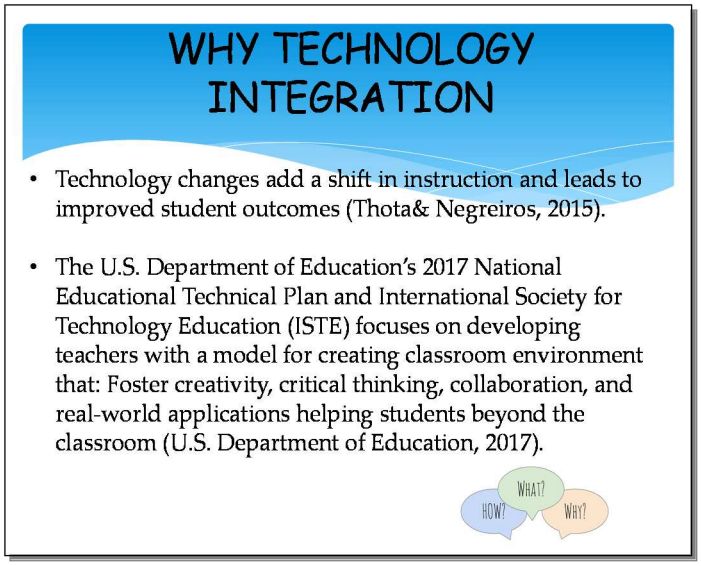


Slide 5

WHAT

Rogers (2003) diffusion of innovation theory endorses the ability to share relationships between users to facilitate the awareness of the technology. In order to estimate the effect of teacher technology awareness, user engagement for changes in technology needs should be identified.

Collaborative learning and shared practices will help to support the changes needed for teachers technology awareness and engagement to develop technology skills. Therefore, Rogers (2003) theory of diffusion supports the technology integration plans for teachers because teachers learn best by sharing and working collaboratively.

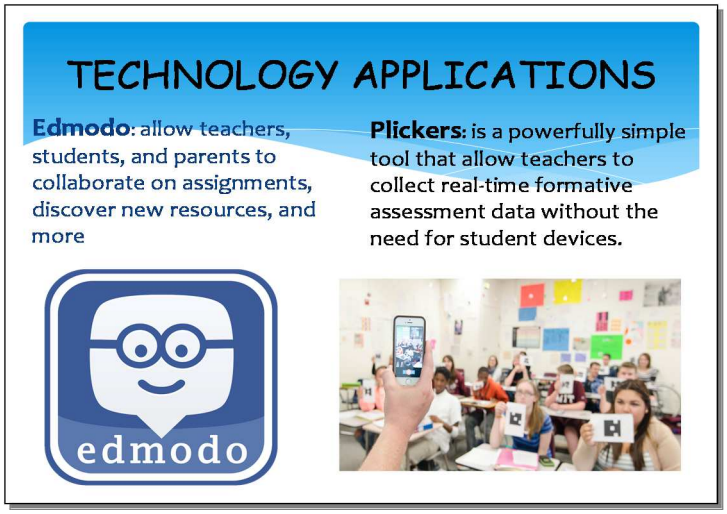
Slide 6

HOW

Keep if Smart and Simple:

Marcinek, A (2014), states that "technology should be kept simple to ensure a smooth integration. With millions of apps and programs that teachers can choose from, you want to find the handful of apps that work best for you and your students" p.2).

Slide 7



Slide 8

Slide 9

SOCRATIVE....

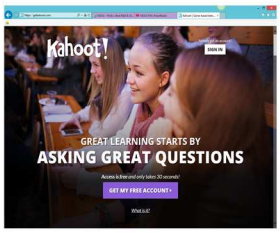
Socrative lets teachers engage and assess their students with educational activities on tablets, laptops and smartphones. Through the use of real time questioning, instant result aggregation and visualization, teachers can gauge the whole class' current level of understanding. Socrative saves teachers time so the class can further collaborate, discuss, extend and grow as a community of learners.

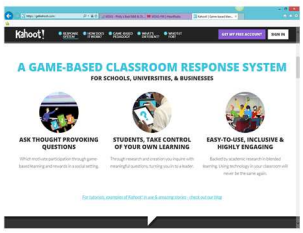
https://www.socrative.com/

Slide 10

KAHOOT..

A classroom response system which creates an engaging learning space, through a game-based digital pedagogy.





www.kahoot.com

Slide 11

GROUP ACTIVITIES

* Demonstration of Tech Tools for classroom use from industry experts
* Teachers will register for each of the tools
* Think-Pair-Share activities
* Collaborate in groups by discipline, master, and novice users on effective technology usefulness.
* Review ideas on subject matter content.

Slide 12

DAY 1: Intro to Tech Tools

- Technology changes the way we teach, learn, create and communicate.
- Classroom technology can be used to compliment books.
- Give students more independence and trust.
- Creates an environment where students are self-motivated to learn.
- Allows teachers to use their skills to develop a collaborative community of learners.

* Technology presenters and district administrators to share how teacher evaluations will impact technology integration.

Slide 13

DAY 2: Tech Tools

* Teachers: reflect on what was learned from Day 1.
  * Video Time: Teachers Collaboration for Learning and Leading
  * Discussion and Feedback session on video
  * Presentation by Google Expert, Kahoot Expert and Nearpod

  * Activities:
    - Teachers will review technology tools (eg.Google Classroom, Kahoot, Nearpod and experiment with each.
    - Create a personal account.
    - How to use Lynda.com site for technology resources.

Slide 14

DAY 3: Tech Workshop

* Activities:

* Participants will practice and use computer and identify effective technology for subject matter instruction.
* Grouping by master, novice users and discipline will use technology tools and resources to create lessons and setup for classroom instructional practices.
* All participants are expected to collaborate and give feedback on all activities to class.

Slide 15

DAY 3: Workshop Contd.

* At the end of the workshops, participants will complete evaluation.
* Additional time allotted for questions and concerns.
* Instructor contact information will be given for future support.

Appendix B: Letter of Cooperation from Vocational High School Administrators

[redacted]

I am a doctoral candidate in the Richard W. Riley College of Education at Walden University. My proposed project study title is "Vocational High School Teachers' Perceptions about Technology Integration at Their School." The purpose of the qualitative project study is to investigate vocational high school teachers' perceptions about participating in PD related to technology integration in the classroom and barriers to successful PD for technology integration in the classroom at a vocational high school in the northeastern United States.

I would like to collect data from teachers at the vocational high school. Data collection were accomplished by semistructured open-ended interview questions about of technology integration efforts in the classroom and barriers to successful implementation.

Participating in the study will not entail the names of teachers, administrators, school or staff. Your cooperation and authorization would be greatly appreciated.

Please contact me if you have any questions.

Sincerely,

Darlene S. Morrison

Appendix C: Letter of Invitation

Dear Fellow Teachers:

I am a doctoral candidate in the Richard W. Riley College of Education at Walden University. My proposed project study title is "Vocational High School Teachers' Perceptions about Technology Integration at Their School." I would like to invite you to take part in a research study to examine vocational high school teachers' perceptions about technology integration in the classroom and barriers to successful implementation. Several teachers are invited to participate from [redacted] in the study.

Please know that your participation is completely voluntary and confidential. If you agree to participate in this study, please sign and return the informed consent fom.

Thank you in advance for your cooperation.

Sincerely,

Darlene S. Morrison

I Agree to Participate

I Do Not Agree to Participate

Appendix D: Interview Questions

1. How many years of experience do you have as a teacher?

2. What is your content area?

3. What is your age category?

20-30, 30-40, 40-50, 50-60

4. Please describe your experiences integrating technology in your classroom?

5. Please describe your experiences participating in district sponsored technology-based professional development training?

6. Please describe your experiences gaining assistance with technology integration?

Prompts:

- What was your experience getting assistance from other technology-based instructors?
- What was your experience getting assistance from any other instructor?
- What was your experience getting assistance from online resources?
- What was your experience getting assistance from PD?

7. Please describe factors you perceive helped you overcome challenges to successfully integrating technology in the classroom?

Prompts:

- What was your experience getting assistance from other technology-based instructors?
- What was your experience getting assistance from any other instructor?
- What was your experience getting assistance from online resources?
- What was your experience getting assistance from PD?

8. Please describe any challenges you experienced successfully integrating technology in the classroom following PD training session?

9. If you could suggest technology-related professional development training sessions, what would you suggest?

10. If you could suggest opportunities for technology-integration, what would you suggest?

11. Please feel free to provide any additional experiences about technology related PD training sessions that you have attended.

Interviewer: Thank you for your participation in this study. Once I have transcribed the interview transcript and field notes. I will contact you to ask for your feedback.