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Technology Strategies in the Classroom After Completing Professional Development

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COLLEGE OF EDUCATION

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Abstract

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MA, University of North Texas

BS, University of Central Florida

Doctoral Study Submitted in Fulfillment

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Abstract

In a school district, teachers and administrators found that students lacked the academic technology immersion necessary to ensure their technological preparation for the 21st century. Professional development was offered to prepare teachers to integrate 21st century technology into their instruction; however, teachers were not fully implementing technology. Administrators and stakeholders have indicated concern. The purpose of this study was to explore whether professional development was effective in increasing teachers' capacity to integrate student-directed technology into instruction. The study, guided by Prensky's transformation and Siemen's connectiveness theories, indicated that technology immersion was necessary within schools. The research design was a qualitative explorative study comparing archival teacher learning logs of 15 teachers from 5 high schools with 2 questionnaires. The narrative findings from the learning logs were cross-checked through triangulation with the percentage data from a Likert-type scale and questionnaire to ensure trustworthiness of the interpretations. Data indicated that professional development increased technology integration in a moderate way, but for full technology integration, these findings suggested that a fully comprehensive integration would better prepare students for the future. The purpose of the white paper report was to encourage stakeholders to collaboratively discuss the needs of teachers and review strategies to meet the 21st century technology skills of students. High school stakeholders who read this white paper may be prompted to discuss options to equip students to use 21st century skills to address personal, local, and world issues.

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Dedication

This project is dedicated to my husband for his support and patience. The months turned into years, the challenges turned into crisis situations, and yet he never lost faith in my ability to weather the storm and complete the task. This support has reminded me why this marriage has lasted for so many years. I also want to dedicate this to Nicholas and Laura for their unending listening and caring. The many phone calls and reassuring conversations made all the difference in the world. Jeremy and Matthew, thank you for being there to offer help and push me forward with jokes and listening to the tears.

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An intense support system is required to successfully complete this journey. My family and group of friends made this happen. To Dr. Carolyn Hunt: Without your unconditional dedication to our friendship I would have abandoned the journey. I will value our time at the beach that solidified our friendship for all times. We stand together as successful friends and educators.

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I owe great thanks to the instructors who worked so hard to develop our professional and academic skills, enabling us to work in the future as educators contributing to our students' future. Dr. Szecsy merits special "thank you" for the many critiques that pushed me forward as an academic writer. Dr. Butcher has also been beside me for these many semesters, guiding, critiquing, and adding to the scholarship of this new researcher. I owe him an unending debt of gratitude.

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Section 1: The Problem

Introduction

Technology immersion has become a part of education, but technology has not become a part of all students' experiences in all schools. The delivery system of education involves teachers talking and students listening, but the students are "not home to receive the package." Education now needs a balanced approach to using technology to deliver information (Prensky, 2010). The U.S. Department of Education stated that technology is available but varies across schools depending upon funding from the states toward technology (USDOE, 2010). This one factor alone creates different experiences. Teaching depends mostly upon the relationship between teachers and students working from textbooks and does not always include technology immersion. As a result, individual educators have not fully implemented technology into their classrooms (Belland, 2009; Prensky, 2009). When students have adequate access to technology, they have access to Internet multimedia social resources that connect them immediately to friends locally and worldwide. Students in turn expect these resources in the classroom, but do not always have the equipment (Schmidt & Cohen, 2013). The Kaiser Family Foundation and the U. S. Department of Education reported that a typical teenager interacts with entertainment media an average of 53 hours a week (USDOE, 2009).

A lack of similar interaction at school becomes a challenge for education. Education must focus on how to provide enough technological resources to allow all students to learn to use technology in positive learning environments (Prensky, 2010). Prensky (2010) also suggested that changes need to occur in information delivery processes with adequate equipment provided to prepare students to effectively use

education and social technology. Changes in teaching strategies must match student demands through professional development teaching strategies that prepare students for their technology-based future (Ertmer, 2005).

Research on technology and technology immersion indicates a gap regarding how technology has been integrated into the classroom using student-directed strategies after faculty technology-based professional development. As a result of professional development, students use the Internet and have technology-based access as more innovations and programs are created (Bellanca & Brandt, 2010). Students' needs are emphasized through professional development and include global technology skills of the 21st century to engage, motivate, and inspire them (Bellanca & Brandt, 2010; Ed. gov., 2009). Friedman (2007) suggested that today's learners have an innate urge to connect with other people due to what he described as the world becoming "flat" as technology becomes more easily accessible. Internet communication throughout the world has become familiar and a daily expectation of students (Friedman, 2007; Guy, 2011; Thornburg, 1994). Students can make learning connections when they have new ways to communicate with each other (Friedman, 2007). Friedman (2007) suggested that people find it objectionable when they are unable to connect with one another. Professional development shows teachers how to accomplish communication and connection goals for students

The Internet has created connections and is becoming more accessible to more people around the world. Experiences such as the electronic teaching websites such as Khan Academy, (2011) demonstrate ease of access to the Internet and successful changes to teaching strategies. They offer math tutorials through electronic media viewed at

home, with students completing their math module homework in the traditional school setting thus "Flipping the Classroom" (Berrett, 2012; Garver, 2013; Khan Academy, 2011). This concept of "Flipping the Classroom" created a boost in students' interest in math as they "flipped" home and school work (Berrett, 2012; Garver, 2013; Khan Academy, 2011). Comprehension enhancement comes from the new ability to rewind videos and do class work at home, and homework modules at school. The concept of the flipped class involves students working at their own pace and having input into the curriculum, which results in activities being more student directed (Berrett, 2012; Garver, 2013). Teachers can also create an individual program for each student and incorporate student input and direction. Monitoring each student's work and progress helps teachers eliminate traditional lecturing and meaningless worksheets (Berrett, 2012; Khan Academy, 2011). "Flipping classrooms" adds flexibility by changing the role of the teacher to that of an academic coach for students, and the role of students to that of active learners helping to guide their own learning. Khan Academy continues to gather data on the results of the changes of student directed curriculum and a flipped classroom to help educators in planning future curriculum and methodology (Khan Academy, 2011). Khan Academy has demonstrated that student-directed strategies are part of the future for students. Changing strategies to support and use technology changes strategies in the classroom.

Because of Internet technology, the world has changed in how technology is used, and now education must follow suit and change to allow students to use technology to learn on a daily basis (Bellanca & Brandt, 2010; Guy, 2011; Prensky, 2009; Thornburg, 1994). Change in how students are taught must occur if students' needs are to

be met (Friedman, 2007; November, 2010; Prensky, 2009). Teachers must be taught how to use new student-directed technology-based strategies to move toward 21st century learning demands. Technology focusing on 21st century skills allows for engagement and understanding (Casner-Lotto & Barrington, 2006; Partnership for 21st Century Skills, 2008). The Partnership for 21st Century Skills (2008) suggested that engaging students with world data and tools that allows interaction with experts in many areas allow for meaningful problem solving and mastery of content. Using tools to research, organize, evaluate, and communicate with digital technology allows students to navigate on a world stage. Technology-based learning strategies and teacher training must align with each other to prepare students for 21st century technological competition. Exploring how a district uses technology immersion to change teaching strategies will allow insight into how student-directed strategies are changing due to professional development.

Definition of the Problem

A district in the Southeastern United States experienced an insufficient amount of technology-based teaching strategies within the past 5 years to ensure that all students are prepared with 21st century technology skills according to a 20111 report from the study district. The local district ranked as one of several top-scoring school districts in terms of state standardized test scores in the Southeastern United States. The study district has invested heavily in technology professional development to keep teachers current on technology strategies. The problem the local district faces is that teachers are not immersing the technology strategies they learned in professional development into their classrooms. The local district administrators in the study worked to provide professional development technology for teachers, followed by assessment of new strategies

implemented in classrooms and provided training programs for new teachers that introduced technology use into classroom settings. When teachers' in the study district attended training, they reported what they learned and how they implemented it into their classroom. Archival data on the impact of professional development programs provided insight into how technology immersion occurred in the classroom environment as reported by teachers.

The problem for this study centers on how much the technology strategies were accepted by teachers and integrated into the classroom. To measure teacher acceptance of using technology, Yuen and Ma (2008) used the Technology Acceptance Model to study technology acceptance and immersion. They found that the attitude of teachers toward computers affected their use of technology and their use of the training they received through professional development (Yuen & Ma, 2008). Their study showed that teachers remained reluctant to engage in or frequently use technologically based activities. Their findings showed that there must be a level of perceived usefulness, perceived ease, behavioral intentions to use, and actual use for technology to be accepted and used. Inconsistency in any of these areas created a need for further research to look at technology use and the social factors that prohibited the full use of technology in schools. These factors remained important for acceptance and use by teachers. The perceived usefulness of computers influenced their use of computers and the amount of confidence they possessed in using technology. The human and social factors played a part in teachers' feeling that they effectively increased learning by using computers, and by using student-directed learning (Green, 2007; Lewis, 2010; Yuen & Ma, 2008).

Additionally, Koehler and Mishra (2009) and Harris and Hofer (2011) stated that teachers' technological and pedagogical content knowledge, measured through the TPACK scale (Technological and Pedagogical Content Knowledge), affected their instructional planning and influenced how much they integrated technology into the classroom. TPACK evaluated the basis of content and learning processes and the effective use of educational technologies. TPACK strategies did not ensure that students experience immersion in the use of technology on a daily basis. TPACK was designed to identify the nature of knowledge required by teachers for technology integration in the classroom. It was further intended to explain the interaction of knowledge through ccontent, pedagogy, and technology and built on the phenomena of teachers integrating technology into their pedagogy (Abbitt, 2011; Harris & Hofer, 2011; Wise & Jacobs, 2010).

When teachers are confident in their computer use, they feel positive about integrating technology into their classrooms (Hart, 2010). Hart (2010) showed a positive effect on the perception of the ease of the use of technology in general. The more teachers used computers and technology, the more likely they were to develop a positive attitude when teaching using technology. Chen, Looi, and Chen's (2009) qualitative study results showed that the most important factors in teacher acceptance of technology came from teacher technological beliefs, as well as teacher ease in accessing technology. Teachers also needed support from administrators and additional technology support (Chen et al., 2009). Support remained an important factor in teachers' self-confidence in their use of computers and technology-based strategy success.

Public schools added technology-based professional development opportunities, which increased the knowledge base of teachers about integrating technology and changing teaching strategies. The problem of integration of technological strategies after teacher training remained an issue that needed investigation (Levin & Wadmany, 2008; Liu, 2011; Matzen & Edmunds, 2007). A gap existed in research showing the specific uses of technology immersion and integration in the classroom after technology-based professional development. Assessing what happens in the classroom through teacher reports, observation, and questionnaires helps educational institutions gauge the inclusion of technology and changes in student-directed strategies using technology and helps in the assessment of changes in strategies in the classroom (Matzen & Edmunds, 2007). This study is an assessment of technology integration, immersion, and changes in teaching strategies taking place in a school district after technology-based professional development.

Rationale

Evidence of the Problem at the Local Level

Professional development concerning educational technology-based activities has been sporadically integrated in daily teaching strategies in the study district, creating a local school district problem. This problem is important because as students face a technology driven future, teachers must be current on technological student-directed strategies through professional development (Lewis, 2011; Prensky, 2009). District technology allocations face challenges and teachers need support and encouragement in order to immerse technology that will improve student learning in preparation for 21st century learning (ACT, 2011; Prensky, 2010; Siemens, 2007; US Department of

Education, 2001). Teachers consistently used non-technology-based teaching strategies after participating in technology-based professional development in the study district. This lack of consistency is worth studying because if teachers fail to use technology immersion, students will be poorly prepared for their future (Prensky, 2009). The district technology plan showed that teachers at the local high schools stated that they used technology even when they used nothing more than an electronic gradebook or a LCD projector and provided a specific professional developments curriculum to address areas of concern within the study district.

Technology immersion mean having one-on-one technology available for all students while teachers provide student-directed curriculum to allow students to be fully involved in their own learning process. Providing supportive and focused professional development, student laptops, wireless Internet connections, curricular and assessment resources, and technological and pedagogical support will lead to total system support of 21st century skills (Shapley et al., 2010). Teachers in the high schools reported that they still used non-technology-based teaching strategies after participating in professional development and failed to contribute to full immersion in the use of technology. The study district technology plan showed that administrators did not see the amount of technology in the classroom that they expected after time and money were spent on training and planning for specific professional development activities to address areas of concern. Shapley et al., (2010) stated that achieving full implementation was challenging because schools selectively used technology. Schools reported having trouble changing instructional practices (Shapley, 2010). This element alone could stand in the way of a school fully using technology with all students using student-directed learning strategies.

The technology plan further showed that when teachers created lesson plans, they reported the use of videos, emails, grade programs, and overhead projectors as integrating technology and felt that these uses of technologies were changing learning. Past district Learning Logs of the study district recording technology immersion showed that administrators did not see teachers fully immersing and integrate technology into the classroom.These Learning Logs showed that teachers used technology-based activities as a way to provide information to students, not as a way to teach using student directed strategies. The technology Learning Logs of the study district showed that at least half of the teachers reported increased use of technology after attending professional development, but did not show that teaching strategies had changed.

The technology report and walk-through data of the study district showed that administrators did not see the increased use of technological strategies or student-directed strategies after teachers' reported using more technology immersion through lesson plans. The technology and the walk-through data showed that technology became one of the most influential aspects of learning, but the educational system had not moved quickly enough in the study district to teach students to survive in the technological future (Davidson & Goldberg, 2009; Wise & Jacobs, 2010).

This study school district used the state's *Education State Commission Competencies for Teachers of the Twenty-First Century* and the district's *Vision for Instructional Technology* to guide their technology planning. The competency standards for this state outlined indicators for successful technology-based integration (FDOE, 2011). Standards, such as communication, assessment and improvement, diversity, and ethics criteria, became standards that teachers were to uphold in all curriculum and

instructional strategies. The school district in the study established key indicators in the learning environment to promote excellence that involved incentives for students. Continuous technology immersion and teaching strategy improvement in the study district remained the goals as the educational environment prepared students for the 21st century. The study district funds allocated to professional development resulted in changes and improvement in teaching strategies, but the district observed that some teachers failed to implement the new strategies once they returned to the classroom.

Terms and Definitions

This project uses the following special terms:

21st century learners: Modern student learners who understand, synthesize, and use massive amounts of information available through the Internet and multimedia devices; easily access technology hardware and software; and have instant access to anyone in the world (Yuen & Ma, 2008).

Constructionists learning theory: A theory that learners construct knowledge for themselves through their experiences (Ally, 2004).

Digital natives: Learners who grow up in the world of Internet technology and readily use information found through the Internet (Lei, 2009; Prensky, 2009).

Educational instructional technology: Instruction based on technology that facilitates learning through creating, using, and managing performance through Internet based technological processes and resources (Hlynka & Jacobsen, 2010; Seels & Richey, 1994).

Educational leadership: The process of guiding and leading educational professionals to influence the pursuit of educational objectives held by the group (Gardner, 2007).

Educational technology theories: Theories that define the relationship between technology and educational societies through the Internet (Harasim, 2012; Seels & Richey, 1994).

Professional development: Collaborative learning experiences that nurture the professional growth of teachers, change teacher practices, and improve student achievement (Lawless & Pellegrino, 2007).

Student-directed, problem-based learning principles: Students learn by addressing authentic problems, reflecting on their experiences through ownership of their learning (Vosinakis & Koutsabasis, 2011).

Technology: The primary usage and knowledge of computer and Internet hardware, software, and multimedia devices to promote learning and solve problems (Lei, 2009).

Technology-based learning: Student learning that primarily uses computers and Internet hardware, software, and other multimedia devices to increase learning (Lei, 2009).

Technology-based professional development: Educational training or programs that instruct teachers in the use of technology in the classroom to provide student-directed learning (Lawless & Pellegrino, 2007; Lei, 2009).

Technology immersion and integration: The consistent use of technology-based programs and activities in the classroom (Davies, 2011; Yuen & Ma, 2008).

Technology literacy knowledge: Knowledge that develops as teachers and students use computer skills, and refine the ability to use computers and other technology to improve teaching and learning (Davies, 2011).

Transformative learning: A term used to describe learning that triggers a significant change in the consciousness and knowledge base of a student (Brock, 2010).

Student-directed learning: A term used to describe learning in which students choose tools and resources to meet their goals (Edelson, Gordin & Pea, 1999; Hannafin, Hannafin, & Gabbitas, 2009).

Significance of the Problem

When district teachers learned new technology strategies but continued to use traditional teaching strategies, they failed to prepare students adequately for their future in a digital world (Liu, 2011; Prensky, 2009). Studying this problem would be useful to the district so that students could be prepared for 21st century connections as their teachers immerse technology using student-directed activities (Bellanca & Brandt, 2010). Bellanca and Brandt (2010) suggested that providing educators with opportunities for technology-based professional development helps schools create an emphasis on 21st century technology skills. Lack of clarity about the nature of 21st century technology remains a problem in education (Bush & Mott, 2009). Confusion often occurs when teachers do not understand why they need to use technology and how to use strategies to prepare students for the 21st century (ACT, 2011; Ketter & Stoffel, 2008; Matzen & Edmunds, 2007).

Guiding/Research Questions

With increased pressure on school districts to maximize the use of funding, a description of the effectiveness of educational technology-based professional development in improving student learning in the district demanded research. In addition, there was a need to investigate the effectiveness of new strategies using technology-based activities with teachers and to gain formation on the use of technology by teachers, and attitudes of teachers toward using technology. Quality educational technology professional development provides teachers with time and support to learn new technology-based strategies to meet the needs of the 21st century learner (Bush & Mott, 2009; Ketter & Stoffel, 2008). This design reflected how teachers used technology and recorded their responses regarding technology use.

Past research suggested that most teachers have limited experience in implementing instructional technologies. Teachers' integration of technology-based student-directed activities is impacted by training, equipment availability, and teacher beliefs (Kotter & Stoffel, 2008). The study provided needed data on the lack of technology immersion after technology-based professional development (Creswell, 2007, 2009; Onwuegbuzie & Leech, 2006). The answers to the questions impacted the district's educational decision-making.

The study was guided by research questions focusing on changes in strategies and attitudes toward technology-based, student-directed activities after professional development.

1. In what ways do teachers' report using technology-based instructional practices in the classroom that they learned about through technology-based professional development?
2. How do teachers' interpret the professional development they received and current technology-based teaching strategies?
3. How do teachers' interpret the professional development provided by the district with respect to 21st century learning?
4. How do teachers' experiences with technology-based professional development experiences relate to student-directed technology strategies in the classroom?

Review of the Literature Addressing the Problem

Literature shows that technology immersion grew after the second half of the 20th century and has become the future of education. With instant communication and instant connections, the world has become instantly accessible to all students. Educational institutions that act as isolated buildings that dispense knowledge no longer fit the traditional definition of school. The world now disperses knowledge, and research shows that technology-based learning and technology collaboration changes education.

The technology theoretical frameworks of transformation and connectiveness justify the investigation of this problem as a worthwhile scholarly endeavor. The area of academic technology immersion was limited, but the literature found on the field of technology theories supports the main theories and concepts of the growth of technology and the need for new teaching strategies. Technology growth in the field of education has begun to change the way in which students receive new information, process it, and meet

the demands of educational institutions of the 21st century (Bellanca & Brandt, 2010; Schwabenland, 2009).

Theories of technology learning now fit in the field of education, and not just the field of business and commerce (Prensky, 2009; Taylor, 2008). From the 1960s until today, the influence of instant communication through technology, especially the Internet, has grown and developed. Since 1969, ordinary people have connected through the Internet; because of the instant communication that the Internet affords, the world has become instantly accessible to all students (Davidson & Goldberg, 2009). The field of education now disperses knowledge in multiple formats, and research shows that technology-based learning and technology collaboration teaching changes education (Bell, 2011; Siemens, 2004).

The ability to access, to create, and to save information grew and affected education as more schools added technology. The need for people to save information has not slowed down, nor will it stop in the 21st century; this need will require new technology to keep up with the latest developments in programs (Davidson & Goldberg, 2009). Gray and the National Center for Educational Statistics (2010) reported that student computer use has increased to 84% of a school's student population, regardless of the size or the income level of the school. Whether a school is large or small, rich or poor, technology has become part of everyday expectations. This phenomenon has changed the way in which learning occurs for students and has created a positive focus on technology. Gray and the National Center for Educational Statistics (2010) reported that over 95% of school classrooms now have computers with Internet access, so schools are

including student-directed activities and distance learning in the curriculum (Maskit, 2011; Matzen & Edmunds, 2007).

Education in the 21st century now includes strategies of inclusion and distance learning (Al-Khatib, 2004; Yuen & Ma, 2008). These new strategies exist beside traditional methods of teaching. Teachers have sporadically taught technology skills in isolation without relevance to students' learning or as add-ons in the classroom. Sporadically using technology has not brought about the desired engagement by students (Feenberg, 2001; Maskit, 2011). Al-Khatib (2004) suggested that transformational idea in technology theories needed to promote authentic learning in project-based supported models across the curriculum. For example, strategies such as integrated and collaborative learning supported by web forums, conferencing, Internet resources, interactive emails, and Internet video interactions create modern learning experiences for all students (Al-Khatib, 2004).

Information has been accessible through books and libraries, but the Internet brought to the world the ability to instantly search for and obtain answers (Bell, 2011). These new means of gaining information and interaction between Internet proficient students and teachers require new levels of skills (Bell, 2011). The skills to use information quickly and effectively require students to be independent evaluators (Davidson & Goldberg, 2009). Knowledge acquisition now occurs through individuals searching or being a part of blogs and collaborative, interactive websites (Bell, 2011; Richards, 2010) Bell (2011) suggested that definitions of knowledge include individuals making sense of the world themselves. For example, in the past, the traditional teacher told a student what defined knowledge and what they must know, but now students

demand input into their own learning. Theories of learning based on the assumption that students were taught by teachers did not provide a framework for the digital age (Bell, 2011). Bell (2011) further suggested that educators look at new ways in which to present information in the future. Bell (2011) agreed with Goodyear's (2001) and Castell's (2000) statements that new communication collaborative technologies define the future of technology. Bell (2011) projected that, in the future, students would be fully technological networked and would need to have skills to work with others on a collaborative basis to solve problems. Transformational theories drastically will change student and teacher behaviors (English, 2009).

Change

Gleick (2008) stated that the change that came to education due to technology resulted in chaos within system. There were no longer solid rules for interaction for communication (Gleick,2008). In making the shift to the new technological age, schools did not meet the technology needs and demands of the students (Christensen, Horn, & Johnson, 2008). Christensen et, al. (2008) further stated that children learned differently and that the way schooling was arranged would never allow educators to teach children in customized ways. Disrupting the present system was the only way to bring about change and allow smart things to happen in teaching. Burke (2011) stated that initiation of change occurred more easily than sustaining change, and that sometimes chaos resulted before change occurred. To ensure change, a district must first understand that educator attitudes and habits remain difficult things to change (Bell, 2011; Christensen et al., 2008).

Change through The U.S. Department of Education's (2009) Enhancing Education through Technology (EETT) program, a part of the No Child Left Behind Act of 2001, supported improving student academic achievement by using technology. The EETT (USDOE, 2009) showed more inclusion of technology. According to this report, teachers reported increased use of technology on a weekly basis (USDOE, 2009), as compared to teacher use from previous years. Understanding of technology used in instruction and learning, along with learning gains, showed the benefit of the change in student learning (USDOE, 2009). The EETT federal program (USDOE, 2009) supported change by improving student academic achievements with technology-based activities and encouraged teacher training to establish instructional methods implemented as technology-based best practices. With the changes, new technology theories began to evolve (Beetham & Sharpe, 2007).

Technology Theories

In all areas educators have integrated technology more frequently into classroom settings, but have continued to look for theories and guidelines to help them (Bell, 2011). New theories have been needed to explain information changes and to explain how educators adjust to those changes. Administrators and policy makers have needed theories to help them make decisions while taking into consideration the impact of technology changes on the learning environment.

Behaviorist and cognitivist theories have been contributors to the development of technology theories. Ally (2004) stated that the shift to the transformation and connectiveness theories has occurred as learners have demanded to construct their own learning from multiple sources of information. As behaviorists and cognitivists theories

were developed, the world became networked through technology, but the two theories have failed to explain the world of digital technology (Anderson, 2008; Strong & Hutchins, 2009). The behaviorists believed that learning entails a change in behavior due to the environment. The cognitivists considered learning to be the use of different types of memory and sensory experiences during learning (Ally, 2004; Anderson, 2008).

Constructivism

Constructivist theory continues to add to theories of technology (Anderson, 2008). Collins (1991, as cited in Matzen & Edmund, 2007) found that technology could be the catalyst to change learning from traditional methods to the constructivist instructional practices via technology immersion. As teachers moved through different stages of comfort with technology, it became more integrated, and teachers' attitudes changed (Matzen & Edmund, 2007). The traditional approaches continued to need reinforcement through technology as the comfort level increased (Matzen & Edmund, 2007). Teachers used technology in ways more similar to constructivist, student-directed approaches (Ally, 2004; Anderson & Dron, 2011; Levin & Wadmany, 2006, 2008).

Educators and researchers have decided how the roles of learners and teachers have changed (Siemens & Conole, 2011; Thornburg, 1994). Theories around technological learning have continued to be discussed, and researchers have defined the new roles of educators and of those to be educated to construct new meanings for education. Ertmer (2005) and Matzen and Edmund (2007) stated that learners need to be free to construct knowledge rather than be fed knowledge. Additionally, learners need to be free to apply information broadly to discover and construct knowledge (Ally, 2004;

Prensky, 2008). Technology-based, student-directed strategies create the opportunity for new knowledge, with the student being part of the learning process (Ally, 2004).

Transformation

Transformations have occurred as data have become more complex allowing the digital age to form new theories of cognitive knowledge representing technology learning (Prensky, 2005; Siemens 2007). Inflexible teacher-based curricula have become ineffective in an information age where learning has been transformed by exploration and extended learning based on Internet activities. Student involvement in learning and easy access to information have transformed the way in which the world learns (Siemens, 2007). The digital natives of the future will be comfortable using technology and will demand its increased use in the classroom (Prensky, 2005).

Network learning has adapted and constantly changed, adjusted, and transformed learning while benefiting the world of learning (Ally, 2004; Castells, 2010; Feenberg, 2002). The advancements of society and science have been partially attributed to the increased ability of people and organizations to connect to each other (Siemens, 2005). Siemens (2005) considered there to be eight characteristics of network technology learning. Siemens (2005) suggested that learning and knowledge consisted of diverse opinion, connections of specialized information sources, as well as learning through technology. He further suggested that quantity of knowledge was more critical than quality, that connections facilitate learning, and that connections between disciplines are core concepts (Siemens, 2005).

Siemens (2005) final two characteristics were that current knowledge was the goal of all connectivists and constructivists learning and that decision-making was a

learning process based on constantly changing information. Because of these characteristics of network, technology-based Internet learning, information constantly changes, and the answers constantly change. As changes occur, students needed 21st century technology-based skills to obtain and process additional information accurately and quickly. Students need to adapt and change to transform their learning (Siemens, 2005). Technology and the Internet have become commonplace in developed countries, and will continue developing in the future (Siemens & Conole, 2011). People's ability to share resources and information and become producers of information increased as the global increase in Internet use occurred. Internet technology offered ways to be creative and share ideas, and students had to keep pace (Bellanca & Brandt, 2010; Siemens & Conole, 2011).

Prensky (2005, 2009) furthered Siemens's (2005) ideas of transformation. of learning when he called students who shared information readily "digital natives." Prensky used this term to describe students growing in a world of technology and creating a new framework for technology learners. Technology allows students to work together under structured guidance and directions using technology that goes beyond traditional teaching strategies and has changed the way in which education is presented (Prensky, 2005, 2009). Technology has focused the disinterested student and given the structured guidance necessary to help students become successful (Guy, 2011). Keeping technological students motivated and on track has transformed learning to keep students' focused (Prensky, 2008).

Using technology to ask probing questions, to check that conclusions reflect accurate information, and to create an understanding of the quality of work has moved

students to futures that have become technological progressive (Prensky, 2005). Technology transformation and connections additionally allow opportunities for students to work with others around the world. (Prensky, 2008, 2009) further stated that answers the question of how to transform and connect with learners rest more in changing educational technological teaching pedagogies, than in having technology in classrooms. Schools can no longer exist in a mindset of past establishments, using past traditional teacher-based teaching strategies and not student-based teaching strategies (Prensky, 2005).

Disruptions of the normal way of teaching have occurred when schools have addressed teacher barriers to change and transformation. of learning to meet technology-based needs (Bolch, 2010; Christensen et al., 2009; Levin & Wadmany, 2008; Schwabenland, 2009). Unless external and internal barriers to technology have received attention, change has not happened. Levin and Wadmany (2008) found in their longitudinal study that in order for transformation. to occur teachers had to believe that technology could help student learning. Teachers had to see and effectively understand the success of technology in learning in order to transform strategies, (Gleick, 2008; Levin & Wadmany, 2008). Change agents might be aware of the influences of teachers' educational background on the overall attitude for change. Teachers' individual teaching strategies might be considered. Lastly, teachers need to be shown how new technology-based strategies affect teaching. Levin and Wadmany (2008) suggested that new teaching strategies reflected teachers' beliefs concerning how to teach, knowledge bases, and experiences in the past; promoted values toward technology immersion, so that transformation could take place.

If education transforms to meet the technology needs of today and the demands of the future, then education must immediately lend itself to change now the traditional moulding and growth models Peters (2009) described as no longer working in the world where education must transform individuals. Moulding and growing without educational transformation. did not meet the needs of the modern student's technology needs. Reflective technology and student-based inquiry transform learners (English, 2009).

Change and transformation theory depended upon changing teachers through professional development by incorporating technology consistently and allowing for reflective inquiry and growth (Amzat & Al-Hadhrami, 2011). Teachers combined their belief system with their knowledge obtained from professional development to diversify their strategies. The problem surfaced when teachers did not take change back to the classroom (Bertram & Sharp, 2010; Levin & Wadmany, 2008).

Teachers did not see themselves as change agents and transformers of the classroom toward a technology-based environment (Liu, 2011). Empowering teachers with new knowledge and then supporting their use in the classroom changed education to meet the demands of the 21st century learner (Jones, 2009). A young teacher or a seasoned teacher might change if he or she looked at his or her own theories of educational learning (Taylor, 2008). Taylor (2008) further stated adults develop reliable beliefs and validate their decision to make new and informed decisions to meet technology skills needs. This process of change remains fundamental to the adult learning process. Transformative learning theory explains the teacher process of constructing new interpretations of experiences that create new ways of completing activities (Hart, 2010).

Connectivism

Connectivism appeared in 2004 as a new theory that addressed Internet culture, and was the successor of behaviorism, cognitivism, and constructivism in the theories of teaching and learning (Strong & Hutchins, 2009). Connectivism became the sharing of cognitive tasks between people and technology (Siemens & Conole, 2011). As educators decided how educational systems changed, new roles grew among administrators, teachers, and students. The connections between systems created diversity and decision making based on instant access to information (Siemens & Conole, 2011). Not all theorists agreed that connectivism constituted a theory, but it continued to give answers to the new technology used through the Internet (Siemens & Conole, 2011). Connectivism had a set of rules about abstract learning and allowed a community of people to make real what they do (Strong & Hutchins, 2009). This theory of change provided opportunities for practitioners to have a framework as they modeled behaviors in learning and teaching (Bell, 2011).

Siemens (2005, 2007) proposed Connectivism, as a learning theory for the digital age, expanding and moving beyond the cognitivist learning theories. Connectivism network theory became a model for addressing how people learn in a connected and creative networked system (Anderson, 2008; Anderson & Dron, 2011; Bell, 2011; Siemens, 2007). Technological learning became diverse and helped students make the needed connections (Ally, 2004). Connectivism helped student's further construct and make connections from their own experiences (Anderson & Dron, 2011; Strong & Hutchins, 2009) while they made beneficial connections to transform technology (Ally, 2004).

Siemens (2007) also extended Prensky's (2005) philosophy in his pedagogy of Connectivism by suggesting that learning theories of a digital age formed explanations of networks of cognitive knowledge and represented a complexity in technology learning. Siemens described these networks as technological connections that create learning. Inflexible teacher-based curriculum have become more ineffective as technology and technology-based learning have increased (Siemens, 2007). Data has become more complex, traditional curriculum and application have required core concepts that have allowed exploration, and extended learning based on Internet activities. Approaches to learning required instruction using active student involvement in learning and Internet interactions (Prensky, 2005). Additional complex models of teaching, learning, and research have evolved to meet new futures of digital natives, and teachers have increased personal understanding, beliefs, and comfort levels when using technology (Prensky, 2005). As the technology comfort level of teachers have increased, teachers have further understood the necessity to apply constructivist learner-centered strategies to their instruction (Matzen and Edmunds, 2007).

Siemens and Conole (2011) followed up the theory of connectivism by supporting the importance of the networked systems that allowed people to interact and share information but using the Connectivism theory. They suggested that social networking not be ignored regardless of whether the learning occurred formally or informally. The Internet changed how people learned, connected, and communicated (Siemens & Conole, 2011). Bell (2011) also proposed several alternative theories to explain different ways educators could build theories of technology researchers. The many suggestions included each theory by taking into consideration knowledge, skills, time, money, support, and

goodwill (Bell, 2011). Bell (2011) and Siemens and Conole (2011) further stated that connectiveness alone remains insufficient in this Internet world. They argued that choices in theories must be available to educators as technology impacts teaching and learning (Strong & Hutchins, 2009).

Connectivism and the concepts of technological learning theories continued to develop as technology continued to grow and affect every aspect of modern life (Bethan & Sharp, 2007). Ally (2004) and Cheung and Hew (2009) stated that technology-based activities improved learning. Technologies provided connections to learning materials, but educators must know how to use them and know how to teach others using the technology available (Siemens & Conole, 2011). Additionally, Matzen and Edmunds (2007) also supported change through technology teaching when they stated that technology created student-centered learning practices. Technology promoted constructivist-compatible instruction that promoted collaboration between learners rather than the traditional competitive approaches (Matzen & Edmunds, 2007). Professional development began to model the use of technology as a collaboration model. The type of professional development received by teachers determined interactions with technology (Bellanca & Brandt, 2010; Hess, Joshi, & McNab, 2010; Matzen & Edmund, 2007; Taylor, 2008). Siemens and Conole (2011) stated that the key laid in making connections between all the parts, giving teachers opportunities to interact with technology.

Saturation of the literature was reached when the articles became repetitive in their types of research on professional development and documentation of the immersion of technology in the classroom. Search terms such as professional development, technology immersion, technology, survey methods, teacher learning logs, educational

theories, exploratory methods, mixed-methods, connectivism, transformation and social change due to technology, student-directed strategies, and many more topics as the research become more finite. Following related topics allowed more insight into the exploratory process and the theories that supported this research method. The only public data accessed were government statistical documents available to the general public. ERIC and EBSCO allowed easy access to peer reviewed articles directly related to the topics. The Walden Research Department provided access to previous research on technology and immersion in the classroom. Technology research in the last five years allowed me to refine my study to reflect the specific district concerns and model my study to be appropriate to the topic of technology immersion.

The Internet has changed how people learn, connect, and communicate (Siemens & Conole, 2011). Connectiveness theory further expanded with the addition of the transformation. theory of learning (Bell, 2011; Siemens & Conole, 2011). Theories continued to develop around activities that improved learning (Cheung & Hew, 2009). Matzen and Edmunds (2007) stated that change occurred through technology teaching as student-centered learning practices developed and collaborative learning situations became more widely used. The collaboration possible between learners became more effective than traditional competitive approaches (Matzen & Edmunds, 2007). Transformation. of the normal ways of teaching began to occur when school began to address and transform to meet the technology-based needs of students as the theories began to develop. Theories began to be used by educational institutions and educators began to address the 21st century needs of teachers and students (Bolch, 2010; Siemens, 2007). The internal and external barriers to transforming education began to change the

face of education through technology (Bolch, 2010; Christensen et al., 2009; Levin & Wadmany, 2008; Schwabenland, 2009).

Documenting the Broader Problem Associated With the Local Problem

There exists a gap in theories relating to technology use in the classroom, and various ways teachers have changed their teaching strategies using technology and student-based learning activities (Ertmer, 005). Research showed the gap in knowledge about professional development for technology-enhanced inquiry, but did not include all the variables regarding technology-based professional development(Ertmer, 2005; Lawless & Pellegrino, 2007; Matzen & Edmunds, 2007). Much more explorative research results showed the broader immersion factors (Lawless & Pellegrino, 2007). Integrating technology-based student-directed activities into classrooms required technology-based professional development because most teachers had limited experiences implementing instructional technologies (Gerard, Varma, Corliss, & Linn, 2011; Lawless & Pellegrino, 2007).

Twenty-first century learner. *The 21st Century Skills, Education, and Competitiveness : A Resource and Policy Guide* reported what was needed for the future and was adopted as an optional guide for 21st century educators to consider (Dede, 2010; Partnership for 21st Century Skills, 2008). The basis of the framework included core subjects for all elementary and secondary schools with 21st century content such as global awareness, business, and entrepreneurial literacy and civic literary. A student's ability to keep learning ranked as an important item in the framework (Dede, 2010). Students needed to know how to continue learning for their lifetime, and to love learning. The learning included applications for effective and innovative ways to use what they

learn. Critical thinking and problem-solving skills with communication, collaborative, and media literacy skills created a well-rounded student (Bellanca & Brandt, 2010).

Students needed to use information and communication technology to develop 21st century content knowledge and skills. They needed to think critically, solve problems, communicate, and collaborate. Life skills became a key component of 21st century skills as students learned to be leaders on a world stage of personal responsibility (Partnership for 21st Century Skills, 2008). Students lived in a world where being digitally literate, collaborative, and inventive in their thinking provided the ability to be highly communicative and highly productive. Using their language to communicate, relate to others, and conduct projects to insure humans live together in a peaceful and autonomous world met the needs of their future and created change (Bellanca & Brandt, 2010). The 21st century technology skills required learners and workers to synthesize information by bringing together disparate data requiring Internet navigation skills (Mayes & Freitas, 2010).

The web is constantly available to students of the 21st century, and students demand its use on a daily basis. Traditional school schemes failed to be effective for the new Internet thinkers using traditional pencil and paper. Students grew and thrived in a global age based on interactive teaching strategies gathering information and making the ability to solve the everyday problems students faced with more efficiency (Friedman, 2007). A global competitive edge required students to be literate in image usage and screen information (Peters, 2009). Friedman (2007) stressed the transformative ability quality of technology synthesizing materials, connecting information, and creating breakthrough for solving problems in today's world. The Internet is constantly evolving

and therefore students should read beyond the text to acquire the skills necessary to navigate digital technology (Brown, 2000). In the 21st century employers are looking for workers who are able to synthesize information and Internet navigation skills (Dede, 2010).

Teachers in the 21st century are encouraged to change traditional strategies to include technology and student-based learning (Baek, Jung, & Kim, 2008; Ertmer, 2005). Understanding how teachers use technology in the classroom will assist administrators with the transition to a 21st century technology-based learning environment (Kong, 2009). Contemporary research presented a gap in knowledge regarding technology-enhanced student inquiry providing a need for further research (Ertmer, 2005; Lawless & Pellegrino, 2007; Matzen & Edmunds, 2007).

Teachers' beliefs. Previous researchers noted the influence of teachers' beliefs on classroom instruction, but did not established a link to actual use of technology in the classroom (Ally, 2004; Ertmer, 2005; Salend, 2009). Ertmer (2005) concluded that additional research will be helpful to understand why teachers hesitate to use technology on a consistent basis. Siemens (2007) suggested in his change theory that researchers might consider using transformative theories of education to bring about consistent use of technology in schools. Transformation in technology-based learning will help students prepare for their future (Peters, 2009). Strategy change that resulted from technology-based professional development helped teachers leave their comfort zones and develop further technological approaches to learning (Burke, 2011). Teachers had difficulty seeing knowledge as transformation; they failed to see technology as a platform that supported and enhanced students' thinking (Levin & Wadmany, 2006). Changes in the

school system occurred as a result of increased use of technology and affordability. (Warschauer, 2011). As technology becomes more affordable its appeal and likelihood of adoption in the classroom also increase. (Wong & Looi, 2011). Additional use of technology created chaos as teachers' roles in the classroom changed and they questioned their belief regarding use of the new platform (Peters, 2009). Teachers experienced challenges and felt resistance to their belief system about technology-based changes and the impact on their environment (Agosto, Rozaklis, Macdonald, & Abels, 2010; Gleick, 2008).

Teachers automatically wanted control over what they have always known, and how they teach the curriculum. Teachers were expected to relinquish authority as a result of students' access to technology, which required additional student-directed strategies in the classroom (English, 2009; Gleick, 2008; Siemens, 2007; Winzenried, Dalgarno, & Tinker, 2010). Increased access to information transformed the way teachers taught and students learned (Gleick, 2008). A change in teachers' belief system shifted the traditional role of teachers as providers of information (Yuen, & Ma, 2008). Traditional teaching models are not based on student-directed learning where students also assist as providers of information. Teachers resist active change in the traditional model of teaching, and this resistance creates chaos (Bellanca & Brandt, 2010).

Maskit (2011) measured Teacher's Attitude toward change using the "Teacher Career Cycle Model." Less experienced teachers appeared to accept new ideas and strategies more readily than seasoned teachers. Maskit (2011) found that age was a factor in changes in attitude toward the use of technology. He further posited that as teachers reached different points in their careers their level of motivation changed and they were

more willing to try new strategies. Professional development in Maskit's study (2011) helped prepare teachers for technology-based strategic change in the classroom, during different stages of their career. Furthermore, technology-based professional development aided teachers in making decisions regarding the effective use of technology and increased decision-making capabilities about use of the most productive applications to foment directed-student learning (Maskit, 2011).

New teaching possibilities surfaced as teachers incorporated the use of technology in the classroom as a method of viewing curriculum and the pedagogies of teaching (Hart, 2010). Hart (2010) concluded that science education benefited from technology-based action research oriented methodology. He also stated that teachers should be ready to consider these benefits as they transition toward using technology, and prepare students for their futures (Hart, 2007).

Friedman (2007) suggested that students will learn differently with technology-based applications in the future, while maintaining the curiosity and passion to discover their world. Great teaching require stimulating the innate curiosity of learners by making available technologies of the "flat-world", a world in which people are connected through technology (Friedman, 2007). Teachers use technology to create passion in students and keep schools focused on the 21st century (Friedman, 2007). Students are expected to use technology-based strategies to increase their passion for learning in a teacher-supported environment (Hart, 2010).

Jones (2009) stated that feelings of competency was the most important element of change, whether teachers viewed it as a result of feelings of self-efficacy in context or in tasks. Without these elements, teachers hesitated to change (Jones, 2009). Teachers

espoused new practices when they felt empowered; furthermore, they recognized the importance of 21st century knowledge (Kong, 2009). Teachers recognized present and future role of the Internet in fostering needed skills in school improvement plans (Kong, 2009).

Student changes. Contemporary theories should reflect changes in technology; moreover, these changes should also reflect teachers' perspectives, and the way students learn in the classroom (English, 2009). Lloyd, Dean, and Cooper (2007) suggested there is a strong relationship between students' use of technology and the psychosocial development of students and their learn. Lloyd et al.(2007) additionally suggested a need for change, after examining the effects of technology use on peer relationships, academic involvement, and healthy lifestyles. Results from the study demonstrated that the use of technology was helpful to students in their academic and personal lives. Furthermore, the study showed that strategies to deliver classroom technology may increase students' effectiveness as their academic involvement increases (Lloyd et al., 2007). These theories support the need for change as more is learned regarding student learning.

New technology strategies, using whiteboards in the classroom, positively affected the learning environment and students' interest in learning (Winzenried et al., 2010). Winzenried et al. (2010) found that teachers who used interactive whiteboards with their students increased their acceptance of technology and were less resistant to change in teaching strategies. Case studies, questionnaires, and observations, conducted over a six month period, outlined participants' daily use of technology whiteboards with students. Common patterns emerged from the study, which included the use of whiteboards; teachers and students had a positive response toward the use of technology.

Teachers gave examples of using whiteboards to access online newspapers and web sites. Teachers' attitude regarding the use of technology depended on how teachers used technology equipment in their classrooms and how much they allowed students to interact with the technology.

Winzenried et al., (2010) posited a positive relationship between students' attitude about the new technology and effective use of the whiteboard to retrieve information. Students demand change to keep pace with technological advancements. (Van Santeen, Khoe, & Vermeer, 2010); their demands were in line with research that demonstrated that use of technology promoted change (Edmund, 2007; Ertmer & Matzen, 2005 . Edmund et al., (2008) suggested that teachers should use technology in innovative ways to integrate new strategies. Redundant learners require the freedom to discover and construct knowledge rather than be fed knowledge. (Ally, 2004; Prensky, 2008). Technology-based student-directed strategies created opportunities for new knowledge and included students as part of the learning process (Ally, 2004).

The classroom of the future requires students to be proficient in the use of technology; therefore, school officials must meet technological demands (Ertmer, 2005). Christensen et al., (2008) stated that the "future is now" and the world will not wait on education to catch up. Schools continue to shift from individualized instruction to delivery systems targeting batches of students using technology-based, student-directed learning (Ferriter & Garry, 2010). New learners will acquire knowledge through student-centric online technology with ease. Students being raised in a world of instant technology quickly learn to manipulate massive amounts of information efficiently. As a result, leaders in the educational system encourage teachers to embrace strategies that

increases students'use of technology. Thus, in the future students will develop a greater level of comfort in dealing effectively with technology (Baek et al., 2008). Most students have become more technologically proficient than most teachers in. Students possess a sophisticated level of use of technology that goes beyond the level of use of the average adult (Christensen et al., 2008; Ertmer, 2005; Prensky, 2009). Despite teachers' long-held beliefs and resistance to technology in the classroom, student-directed strategies changed students' behavior (Daly, Moolenaar, Bolivar, & Burke, 2010; Lei, 2009). As teachers' level of sophistication increased, the strategic focus on student-directed learning in the classroom evolved to meet the needs of 21st century learners (English, 2009).

The world of technology expanded opportunities for student knowledge resources, but immediate opportunities created a conflict of ideas (Ally, 2004). Clark (2001, as cited in Ally, 2004) in his meta-analysis studies on media research, demonstrated that students gained more from audio and visual equipment as opposed to conventional teaching methods. The benefit gained came from a variety of strategies used by teachers rather than on the presence of technology in the classroom (Clark, 2001, as cited in Ally, 2004). However, disagreement among professionals created a need to reevaluate the use of technology-based and student-directed learning (Lei, 2009; November, 2010; Prensky, 2009).

Technology immersion. Tamim, Bernard, Borokhovski, Abrami, and Schmid (2011) found that many factors influenced the success of technology immersion. Computer technology-based and student-directed content instruction showed a slightly higher than average success rate over technology used for direct instruction (Tamim et al., 2011). Tamim et al., (2011) further found that computer technology focused on

cognitive support demonstrated greater success in learning than computers used only for presentation. Schramm (1977, as cited in Ally, 2004) posited that learning focused on content-based activities and strategies, rather than technology strategies used by teachers. The use of computers alone, to present information, inadequately promoted learning (Schramm, 1977 as cited in Ally, 2004). Change requires a combination of strategy and technology to create knowledge (Ally, 2004). The use of technological devices and other technology-based learning strategies has advantages over conventional classroom settings; however, teachers still require conventional curriculum content and strategies (Daly et al., 2010; Seels & Richey, 1994). Ally (2004) suggested that learners constructed meaning from information presented as a result of synergy between proper strategy and curriculum content-base. Technology allowed teaching and learning to be responsive to different learning styles and motivational levels (Ally, 2004).

Professional development. Teachers' beliefs regarding technology, the views of digital natives, and the challenges of using new teaching mechanisms offered insight into the introduction of technology in the classroom (Agosto et al., 2010; Prensky, 2005). The literature indicated that teachers benefitted from additional opportunities to experience and incorporate new methods of teaching using technology to support increased student learning (Ertmer, 2005; National Council Staff Development, 2014). Well-established teaching practices changed gradually. As a result, proof that technology increased learning demanded continual assessment. Teachers accepted technology as a method of instruction when they understood that technology increased student learning. (Gerand et al., 2011). However, Gerand et al. (2011) suggested that professional development

provided resources and tools that encouraged teachers to change their strategies to include technology-based, student-directed learning.

Christensen et al. (2008) posited that technology did not threaten teachers; in fact, it helped them create exciting opportunities to change learning through the use of technology. Philosophical changes coupled with the reality that change was imminent worked in tandem to accelerate the introduction of technology into the classroom (Christensen et al., 2008). Lawless and Pellegrino (2007), supported by the findings of Christensen's et al. (2008), suggested that changes in use of technology result from high quality professional development, increased contact hours, and follow-up. Lawless and Pellegrino (2007) suggested that follow-up professional development supported engagement in meaningful and relevant activities. Professional development through teacher engagement further promoted peer collaboration and a clearly articulated common vision for student achievement; thereby, promoting change in teacher and student learning (Lawless & Pellegrino, 2007).

Summary

Technology exists as an integral part of most cultures. Technology-based learning has the potential to help students develop skills to operate in the world of technology and connect information to future education (Van Santeen et al., 2010). Increasingly, students required technology use in the classroom (Siemens, 2009). Winzenried et al. (2010) posited that students and teachers are more satisfied with the use of technology when shown skills using student-directed applications.

Saturation of the literature was reached as a result of a lack of new or relevant information on the subject. Saturation was obvious when articles became repetitive.

Search terms relevant to this saturation point included technology, student-directed strategies, technology immersion, 21st century learner, technology theories, professional development, technology-based professional development, and other relevant terms. The Walden Library provided access to a number of academic research databases filled with related articles on the subject. Government and state agency websites provided access to public documents on policies and statistics.

Changes in teaching strategies created a need for collaboration and shared commitment to use technology (Schwabenland, 2009). Ertmer (2005) and Matzen and Edmund (2007) found that using technology brought about change; however, technology must be used in a way that integrates new strategies through collaborative sharing by teachers. For example, teachers collaborate on ways in which learners can feel to construct knowledge rather than be fed knowledge. Additionally, teachers must learn to collaborate with students offer the freedom to apply new information in many areas of learning. The result will allow students to discover and construct knowledge on their own (Ally, 2004; Prensky, 2008). Technology-based, student-directed strategies, created opportunities for new knowledge and included students as part of the learning process. As a result, teachers must collaborate and develop shared commitment toward technology use (Ally, 2004; Ertmer, 2005; Schwabenland, 2009).

Implications

The current study focused on the consistency of teacher immersion of technology in the classroom as a consequence of technology-based professional development. The study considered teacher's attitudes toward technology and technology use in the classroom. Based on teachers' reflections, administrators garnered new ideas for

improvements the use of technology-based learning in the classrooms. Many of the technological advancements that benefited students were a result of teachers' experience and beliefs. This study used answers from participants to generate additional questions, lending credence to the fact that an exploratory narrative design generates additional questions with a broader application. (Creswell, 2009; Merriam, 2009; Onwuegbuzie & Leech, 2006; Stake, 1995; Yin, 2008, 2011).

Research findings were used to educate professionals, teachers, and community stakeholders on the effectiveness of technology-based professional development. Many districts may find that results mirror activities in their own schools. Therefore, district officials may consider increasing professional development to encourage teachers' implementation of technology. District administrators can progress with technology immersion at a rate that benefits student learning (Belland, 2009; Ertmer, 2005; Friedman, 2007). Emerging research studies can be used to create new professional development methods that support inclusion of technology in daily teaching strategies.

As a result of the current study, new knowledge may emerge to improve teaching and learning methods that involve the use of technology. The need for professional development in education will allow teachers to experience the effective use of technology in the classroom, as a result of further studies (Banister & Fischer, 2010; Harris & Hofer, 2011). Teachers require help developing knowledge of new techniques for teaching old curriculum content in new ways. Hardware and software purchases, professional development focused on teacher training, motivation techniques, and ongoing technology support, work together to enhance the teaching experience. This combination of new elements will influence teaching strategies. The use of additional

technology-based strategies will continue to develop as teachers' comfort level increases (Banister & Fischer, 2010).

Placing emphasis on the effectiveness of educational technology during professional development will give teachers a deeper understanding of students' needs and expectations. This study provides insight in the promotion of technological capabilities and will help change learners' attitudes toward the digital future. The current study further seeks to provide a springboard for school administrators to support teachers' changing beliefs about new classroom practices and the need for reviewing current curriculum (Levin & Wadmany, 2008; Lewis, 2011; Morewood, Ankrum, & Bean, 2010). A thorough review of the curriculum focused on teachers' needs before classroom immersion of technology aided in bringing about needed change. Professional development training encourages teachers to incorporate activities that supported teaching and learning through integration of technology in the curriculum.

Future research must demonstrate ways to improve technological teaching practices to avoid disruptions in learning. Researchers must develop innovative ways of testing new practices, which will result in the expansion of teacher's views and practices regarding the use of technology-based education (Agosto et al., 2010). Allsopp et al. (2010) suggested that educators incorporated technology elements that enhanced student self-determination and social-emotional outcomes. Teachers must be able to integrate available technology in the classroom and help improve students' educational, personal, and social skills. Additional research will expand the capacity for change and aid in the development of theories that support new teaching strategies that support and improve all areas of student needs. As a result, new theories will address the needs of teachers prior

to implementing technology in the classroom. Furthermore, future research in this area of inquiry will influence change in negative attitudes about technology immersion.

This researcher hopes to use results from the current study to inform teachers about the importance of preparing students for a world guided by technology. Contemporary education must reflect the needs of the future and incorporate technological changes to meet the needs of 21st century learners. Presentations to districts, state organizations, and national groups through the use of a white paper will help educators understand that improvements in technology-based professional development support changes that prepare students for the future. Helping further prepare students for their future is the utmost goal of this project (Creswell, 2009; Merriam, 2009).

Conclusion

Immersing technology in the classroom will transform the future of education; however, the current level of immersion has not effectively prepared students for the future. Students are often challenged by the concept of the "flat world" (Friedman, 2007) created by technology. Educators must find new and innovative ways to use technology-based strategies to help ensure students prepare for their futures. In order for teachers to become effective users of technology, they need practical strategies to deal with barriers erected as a result of new technology.

Borthwick and Pierson (2008) concluded that the educational system must invest more time and finances in effective professional development to educate teachers about the best use of technology for learning. Teachers must also be reassured that they can successfully and effectively use technology-based strategies to teach their students.

Making financial decisions that further prepare teachers and benefit students is important as schools strive toward higher standards. It is important for district officials to choose effective professional development strategies to benefit teachers and students. Borthwick and Pierson (2008) stated that increased education for teachers on the use of technology resulted from a lack of understanding by stakeholders outside the educational community regarding the need for technology use. Enhanced education includes focus on technology student-directed learning, which allows students to construct knowledge as they communicate with each other.

Professional development must improve student achievement through increased knowledge, improved attitudes, and increased instructional practices that use technology. The first goal of a professional development training program is to change the way teachers teach (Borthwick & Pierson, 2008). Professional development becomes a catalyst for change and increased understanding. Teachers, including novice and veteran teachers, need professional development that is relevant to their needs (Morewood et al., 2010). Teachers must make their voices heard to encourage district leaders to continue improvements in professional development. Change in education begins with changes in the classroom and in the way students' grow as learners.

This triangulated exploratory study design examined whether teachers report a technology immersion change has occurred. The current exploratory study, narrative design, included reported activities of teachers after attending technology-based professional development, and reported level of technology immersion in a high school setting. The problem focused on the lack of consistent use of technology-based strategies in the classroom. This examination produced a report regarding teacher strategies that

might aid in planning future professional development to support the immersion of technology-based teaching strategies into the educational environment. The study adds information about the effectiveness of professional development to aid administrators as they make future financial decisions. The overall goal for improving professional development experiences, remained the focus of the current study. The study provided additional information for administrators to work on providing effective professional development that will result in classroom transformation (Bell, 2011).

A review of present teacher technology strategies may show if consistent changes occurred in the classroom as a result of technology-based professional development. District officials make decisions about the acquisition of new technology based on the increase use of technology by teachers and students demand regarding technology in education. Section 2 of this research study examined teacher's use of technology in the classroom by using triangulated data in the form of historic learning log documents. The Teachers' Attitude and Demographics Questionnaire and Teacher's Perception Questionnaire, with open-ended responses, was used to gather information in the current study. Additionally, this exploratory study design strived to help leaders understand how teachers report technology immersion changes in the classroom. Results from collected data reflected whether technology immersion met the needs of students and changing educational demands. Results reflected teachers' attitudes toward technology and changing strategies. Changes in information acquisition and use of technology in the classroom demonstrated the evolution of technology use in the classroom. Section 3 outlined the use of the white paper to disseminate information to stakeholders. Section 4 is a review of the doctoral process and journey.

Section 2: The Methodology

Introduction

This exploratory narrative study served as an analysis of technology immersion in one school district in the southeastern United States (Stebbins, 2001; Yin, 2008, 2011). The purpose and goal of the study were to explore teachers' interpretations of technology-based professional development, technology immersion, and teacher reported implemented student-directed strategies. Jones (2009) proposed that the current technology transformation in the classroom poses a concern for local education leaders. The current study was engendered as a result of curiosity about the amount of technology immersion in high schools, after teachers reported the results of professional development and questions concerning students' preparation to use student-directed strategies. The driving force behind the current study was to garner results about increased student achievement and changes in attitude toward student-directed instruction. Officials recognized problems with technology immersion; for example, the lack of enough immersion and included it as a topic of discussion in staff and department meetings. However, the full scope of the problem is unclear (FDOE, 2010). Exploring the causes could lead to productive discussions regarding change (Stebbins, 2001).

Stebbins (2001) stated that exploratory research, by nature, is a means to systematically examine an idea for diagnostic purposes and become familiar with the problem. The inquisitive process of examining and investigating the idea and producing recommendations regarding steps to initiate better teacher participation could produce usable data in the future. Results from the current study were skewed by the small number of participants, which indicate that the problem under study did not exist.

However, the small number of participants also indicates that the problem deserves further investigation using a larger number of participants in the future (Stebbins, 2001). A white paper based on this exploration may be an important step toward opening a discussion with a larger number of faculty and administrators. Discussion surrounding the white paper may develop a professional environment in which faculty and administrators can reflect more deeply on their experiences and talk about them openly. This exploratory study could be an important first step in establishing a foundation for a project that can lead to productive discussions and decision-making about technology immersion and professional development.

This current study used teachers' archival Learning Logs to highlight a problem regarding teachers' recording of Learning Logs immediately after professional development instead of after implementing the strategy of technology immersion. The Learning Logs provided an archival record of district technology-based professional development points for teacher state recertification credit (SDOE, 2011). School and district officials used the Learning Logs to assess professional development activities and planned for future technology-based professional development. Learning Logs recorded teachers' perspectives on the professional development workshops. They also outline major ideas from trainings, listing how teachers implemented changes in the classroom. The logs also recorded how teachers changed strategies to include the new training. The issue of incomplete or inaccurate recorded information may result in inaccurate data collection. Unfortunately, some teachers quickly complete the Learning Logs and turn them in for the professional development points to be recorded. Conversely, other

teachers took the Learning Logs back to the classroom and included reflection on their views of immersion of technology.

The use of qualitative data was appropriate for the current study because exploratory inquiry relies on personal views of participants through district Learning Logs and questionnaires regarding the use of technology following professional development. Learning Logs yielded a number of narrative responses from participants, including their experiences and personal opinions in archived forms. Therefore, a qualitative approach was appropriate because the data collected included textual descriptions of experiences, opinions, personal input, and individual experiences to explore technology immersion into instruction (Creswell, 2008). One of the goals for the current study was to seek a better understanding of participants' experiences, and did so within limitations (Creswell, 2008). Data obtained from the questionnaires and Learning Logs contributed to the exploratory study. Patterns and resulting suggestions will be shared with school and district administrators, teachers, and community stakeholders to open discussions to improve technology immersion through professional development training.

An exploratory study, as described by Stake (1995) and Stebbins (2001), was appropriate because of a reliance on archival data. Researcher-created questionnaire reflected responses from a small number of participants. An exploratory study opens questions about professional development for technology immersion and instructional practice, as well as student-directed strategies. I was interested in obtaining data on the effectiveness of technology immersion professional development through Learning Logs and online questionnaires in a less obtrusive manner. Information on the teacher Learning

Logs is confidential and belongs to the district and teachers. Teachers freely provided the data captured by the questionnaire.

I obtained permission from the Director of Research (Appendix B) to access 20 Learning Logs from 20 teachers, after obtaining permission from their principals. Principals were sent a letter describing the study and requesting permission for teachers to participate (Appendix C). Teachers consented to participate in the questionnaire and provided a personal email address to receive the access link to the questionnaire on Survey Monkey.

The follow-up demographics questionnaire included computer based forms with researcher-created questions triangulated with data from the Learning Logs. This computer- based format appealed to high school teachers because of their busy schedules. A quantitative study was not appropriate because of the small number of participants approved by the research department in the district. A large quantitative study was not condoned by the district administrator approving the study. An individual case study (Creswell, 2009) was not appropriate because of the small sample. A longitudinal study (Creswell, 2009; Hancock & Algozzine, 2006) required more time and resources than was available for this study. The exploratory study was a more appropriate design to gain insight into technology-based professional development and technology immersion in the schools and district.

Qualitative data were collected from the archival Learning Logs of teachers from five high schools who volunteered and who were nominated by their principals. Participants who submitted Learning Logs also completed the Teachers' Attitude and Demographics Questionnaire and the Teacher's Perception Questionnaire, researcher-

designed questionnaires, that contained partially close-ended questions (Dillman, Smyth, & Christian, 2009; Salant & Dillman, 1994). Participants self-administered the Teachers' Attitude and Demographics Questionnaire and Teacher's Perception Questionnaire using an electronic format, Survey Monkey, to gather data. The Likert-type scale in the Teachers' Attitude and Demographics Questionnaire used subjective intervals between "*highly agree*" and "*highly disagree*" which were the first items to be administered (Creswell, 2007).

The Teacher's Perception Questionnaire of partially close-ended questions allowed teachers to add information about their personal opinions. Participants were given the choice not adding textual data on the open-ended questionnaire. They could choose only selected responses on the questionnaire. The interpretation of the data occurred after all data were collected. The triangulation of the data that followed showed the differences and patterns that emerged (Creswell, 2009).

This study focused on the discovery of the technological reality in the classroom and on participants rather than the entire population (Creswell, 2009). Patterns emerged based on teachers' experiences as a result of using what they had learned and responded to on the lists provided. Teachers could choose not provide additional information on the open-ended responses to each question on the Teacher's Perception Questionnaire. There was a lost opportunity to obtain rich, thick textual data sets from the questionnaires. Extensive participant responses did not yield a much data to see specific patterns. The patterns were derived from the research provided responses. The patterns became emerging patterns based on responses from the effectiveness of technology immersion, reflections from the effectiveness of professional development opinions. Patterns also

included the success rate of students' use of technology, after implementing new strategies, and teachers' opinions of how the new strategies better prepare students for the future.

Patterns were subdivided by placing rrepetitive ideas into larger categories for emerging pattern purposes, producing the Learning Log data and revealing accessible types of activities, focus of the activity, classroom applications, and assessments of the activity. The overall purpose of the research study was to observe patterns to find ascertain the meaning found in similarities and differences of the information (Creswell, 2009).

The overall goal of the study included a summative assessment of what occurred following professional development and included individual teacher responses, attitudes, and personal experiences provided. The summative assessment outlined results of the professional development and provided an assessment of changes after the use technology-based, student-directed activities. Data obtained from the questionnaires and Leaning Logs reflected teachers' strategic changes following technology-based professional development and student-directed activities. The indicator patterns emerged from teacher responses from the questionnaires and Learning Logs.

The data reflected archival teacher Learning Log information, as well as data obtained from the questionnaire (Creswell, 2008). The current study aassumed that teachers accurately reported technology immersion, based on reports reflected on the Learning Logs. The narrative reflected an emergence of patterns, which represented a snapshot of each teacher's experience with technology.

Teachers' Attitude and Demographics Questionnaire

The current study employed the Teachers' Attitude and Demographics Questionnaire (Appendix E) to collect data on teachers' experiences. The demographic information provided insight into which core courses teachers taught, their gender, and how long they had been teaching. The questionnaire was created by this researcher because teachers needed a simple and less time consuming method to record their experience with technology. The questions reflected views on technology immersion and their attitudes regarding improvement in learning after completing pprofessional development. The electronically administered questionnaire allowed participants to read the questions and answer them individually without interruptions. These answers allowed teachers to record their assessments of success. Teachers' responses on the questionnaires were not available to school or district officials. The Teachers' Attitude and Demographics Questionnaire reflected the level of importance of the activity through a numeric score : 1 = *highly agree* and 5 = *highly disagree*.

Teacher's Perception Questionnaire

A partially close-ended Teacher's Perception Questionnaire (Appendix F) assessed reasons for using or not using technology through responses obtained from teachers. Respondents were given the choice between items that applied to their personal situation. In addition, teachers were allowed to add personal experiences at the end of each individual question prompt. Teachers had the opportunity to express their beliefs and ideas about technology integration and technology experiences.

The study completed by Dillman et al. (2009) served as a pattern for the structure of the Teacher's Perception Questionnaire, using response choices followed by partially

close-ended questions. The objective of the questionnaires was to gather more information beyond selected response in the form of a more in-depth explanation to explain the experience. Another objective was to achieve a deeper level of thinking and an extended time commitment.

Dillman et al., (2009) stated that the open-and-closed ended format of the questionnaire created a hybrid of questions that allowed the participants an alternate response. This question design allowed responses not fitting into the choice of answers. Participants were given the opportunity to share experiences and frustrations regarding technology-based professional development workshops and issues regarding immersion into the classroom. The open-ended option in each question provided opportunities for participants to offer personal insights and other information not included in the other options.

Further questions could have provided information on the concepts and strategies learned from professional development and specific classroom applications. The partially close-ended questionnaire could have provided additional personal opinion input on the effectiveness of professional development experiences. The teachers' opinions could have allowed the option to provide a fresh view of the realities of teaching. Using only a closed data questionnaire limited the opportunity for teachers to add additional information regarding their experiences, attitudes, and feelings. Personal information offered the opportunity to assess whether differences in technology immersion occurred as personal situations changed. Freely sharing information could have added rich information to the study (Dillman et al., 2009). Data could have shown a difference between the responses of older and younger teachers, as well as male and female

teachers. Personal information potentials could have lent itself to assessing whether technology immersion was impacted by the number of years teaching. The sharing of additional information was the expected response from participants; however, few of the participants chose to share. This lack of participant personal responses became a lost opportunity to obtain rich narrative information from teachers about their experiences with technology immersion. This disappointment can be used to prepare for an opportunity yet to be realized. A project that expanded faculty and administrators' knowledge about the challenges and opportunities of technology immersion would help improve organizational and instructional arrangements so that what is offered in professional development meets clearly identified needs and is readily transferred into technology immersed instruction.

The questionnaires contained Likert-type scale responses to questions corresponding to the research questions (Stake, 1995; Yin 2011). The narrative data allowed for a reflection on the participants' professional experiences and opinions in the questionnaire responses. The teachers were given the opportunity to select from options or add a response to each questionnaire prompt. Responses to demographic questions provided additional data on participants and reported indicated that participants represented a variety of experiences, ages, and genders. Additionally, four experts in the field of educational research reviewed the questionnaires. Appropriate adjustments were made to the questions based on their expert recommendations. For example, questionnaire prompts were restated to align with the research questions.

Learning Logs

The coding of qualitative archival teacher Learning Logs (Appendix G) data occurred at five local high schools after obtaining agreement from the individual teachers to voluntarily provide specific archival Learning Logs for research purposes. The summative archival Learning Logs included narrative information about what was learned in technology-based professional development, and how it would be applied to technology immersion. The teacher Learning Logs narratives were completed at various time between 2009 and 2011, reflecting various technology training sessions, and gave an idea of the quality of the professional development attended. A limitation to the Learning Logs is that they were written immediately after the professional development sessions and not after teachers spent several weeks implementing the technology strategy into the classroom. Immediately writing Learning Logs or completing them a week later did not provide much insight into how teachers changed their teaching strategies, how they felt about the changes, and how they saw their students benefiting from student-directed strategies. Some teachers chose to put detailed narrative information regarding their experiences with technology in the classroom, while other teachers had few remarks beyond listing the experience and the limited ways in which they implemented the activity into their classroom. This narrative still did not yield much insight into how their students benefited from the changes. The Learning Logs yielded narrative sources of individual teacher experiences of technology immersion, strategy changes in the classroom, and the effectiveness of technology-based professional development for this study.

Although this study was not a longitudinal study, it allowed a limited objective and narrative exploratory insight into changes over the time period between 2009 to 2011. The study provided data on the differences in technological professional development options available to teachers during that time period. The changes were included as questions in the Learning Logs and were followed-up in the Teachers' Attitude and Demographics Questionnaire and Teacher's Perception Questionnaire.

The archival teacher Learning Logs aided in the principals' choosing teachers from the five high schools in core content departments of Math, English, Social Studies, and Science. The teachers were conveniently chosen from each set representing the core departments based on their completion of archival teacher Learning Logs after technology-based professional development. Teachers volunteered to become participants in the study based on their completing the Learning Log. The principals provided the personal emails of those teachers. Teachers were contacted individually and requested to email their Learning Log, which they voluntarily provided. Participant's names and school names were immediately redacted from the Learning Log. Coding and labeling was with numeric and alpha code by school and teacher. Only the researcher had access to the coding system for the school number and teacher code number. Participants were then provided with an individualized separate link to Survey Monkey to access the consent form (Appendix D) to sign before they could access the questionnaire. Once participants entered their answers and exited the questionnaire, they could not enter again.

The archival teacher Learning Logs written reports provided narrative insight into teachers' perceptions of what they experienced and learned. They also reflected how well

teachers felt they implemented technology in the classroom. The patterns that emerged from the teacher Learning Log data included new classroom activities involving technology immersion, new primary focuses resulting from the professional development, various ways teachers reported the immersion of activities into the classroom, and types of new strategies they would implement into the classroom.

The goals and results of this exploratory study provided insight, understanding, and guidance in preparation of the white paper that would present technology immersion information to school and district administrators, teachers, and community stakeholders. The white paper became a device to build a capacity for communication by encouraging additional discussions by the school and district administrators, teachers, and community stakeholders to open dialogue on further implement of technology immersion into instruction. The information in the white paper would include topics on how effective technology-based professional development was, and how teachers interpreted it into implementation of technology immersion skills. The white paper would allow open discussion between school and district administrators, teachers, and community stakeholders with education and insight into the teachers' interpretation of the long-term effect of technology professional development on technology immersion in the classroom. The white paper would provide input into further discussion on the quality of the professional development to encourage technology immersion in the content areas.

The overall evaluation goals of this study were to allow students to implement what they learn through the immersion of technology in a 21st century environment. Students' preparation for the future through high school experiences remained the focus, whether that future included college, university setting, or the world of employment.

Teacher preparation through modern 21st century strategies better prepares these students to function in a technological society. School administrators must continue to provide professional development activities for teachers to meet their needs and strengthen curricular knowledge (Morewood et al., 2010). Current knowledge of the teachers' strengths and weaknesses might be assessed to provide professional development activities that equip teachers to meet the needs of students (Corbell, Osborne, & Reiman, 2010). Teachers come to the classroom with various skill sets and motivate students of diverse backgrounds and various ability levels, teach students with learning disabilities, utilize multiple teaching strategies, and make instructional decisions meeting students' needs (Corbell et al., 2010).

Participants

Participants selection entailed teachers from five high schools who taught in four core courses, representing English, Math, Social Studies, and Science. The participants must teacher in each high school, have attended technology-based professional development, and completed teacher Learning Logs. A large number of volunteers were anticipated for approval, but the number of participants was limited to how many the district's Research Department would allow in order to protect the confidentiality of the Learning Log data. The study had to proceed with representation limited to the 20 participants with the anticipation of detailed narrative responses from these participants. Access to the participants was provided by the principals of the 5 high schools for 20 participants, 4 from each of the 5 high schools, each representing one of the core departments that participate in standardized testing for the state. Of the 20 participants, only 15 chose to voluntarily participate. Those 15 participants included 11 females and 4

male teachers. The average age was 36 with an average of 10 years teaching experience. The core courses of English and Social Studies were represented equally by 10 teachers, while Science reflected the responses of 3 teachers, and Math represented 2 teachers.

I individually contacted the 20 participants after receiving from the principals, each personal email of the participants. I introduced myself, reviewed the study soliciting their cooperation for being a part of the study, and requested a copy of their individual teacher Learning Logs. I had hoped to establish a strong working relationship with each participant, but only 15 of the 20 participants chose to participate in the final survey. Immediately, I received four teacher Learning Logs via email and I emailed each participant the Survey Monkey individualized link. The link allowed the access to the Survey Money site with both questionnaires. Each participant was required to electronically sign the consent form before they could continue on to the questionnaire. After participants completed the questionnaire, they could go back and review the questions to make any changes. Once they exited the completed survey, they could not return to this Survey Monkey questionnaire.

Participant Protection

Participants volunteered the use of their individual Learning Logs. The principals at each of the high schools contacted the participants to obtain permission to participate, and then provided me with the participant emails. I, at no time, knew which teachers had completed Learning Logs and volunteered to participate before being provided the list by principals. Participants were contacted by me, assured of confidentiality, provided with a consent form, assured they would be protected from professional harm, and asked to voluntarily provide their Learning Logs. Only 15 participants agreed to provide their

learning logs. I redacted and coded names and identifying information with numeric and alpha systems so the Learning Logs had numeric and alpha coding.

The study was not discussed in public, to protect the participants. The study materials will remain in a confidential and secure place for 5 years to protect all participants. I made sure teachers did not feel intimidated sharing their individual teaching experiences about technology. The teachers' rights were protected at all times through assurance of confidentiality, the signing of an informed consent form, the protection of information for 5 years, and the participants access to the study upon its completion. There are ongoing assurances of confidentiality and privacy to ensure comfort in participating. Teachers were assured the information would remain private and would never be used against teachers for any purpose.

The high schools were the largest schools in the district and more fully represent the diversity of the population of the district. One of the high schools was also my working environment. This high school had a rich diversity of teachers and was included in the study as part of my request. The school had the greatest range of student diversity and abilities of any other schools in the district. The size of my school allowed that many teachers do not personally know each other; this anonymity provided a level of confidentiality and unbiased access to the information. I did not influence any teacher into participating in this study. I remained unbiased and objective toward all information obtained. I, at no time, supervised any of the participants. I remained as objective as possible while assuring confidentiality and keeping the participant and researcher interactions professional and unbiased at all times to protect the participants.

Data Collection

This exploratory data collection reflected an open-ended approach and the ability to capture the participant's point of view (Merriam, 2009). The data analysis included results from the results of 15 teacher participants answering the Teacher's Attitude and Demographics (Appendix E) , the partially close-ended Teacher's Perception Questionnaire (Appendix F), and the detailed recording of their individual archival teacher Learning Logs (Appendix G). These results allowed the 15 teacher participants the option to record their personal experiences with technology in narrative responses at the end of each question (Creswell, 2009). Major patterns repeated during the responses helped provide a tracking system of the data and revealed emerging ideas and patterns (Creswell, 2009). The patterns emerged from the Teacher's Attitude and Demographics Questionnaire, Teacher's Perception Questionnaire, and archival teacher Learning Logs as the results become available. The data organization format showed the major ideas of what teachers reported had occurred due to professional development. Unfortunately, none of the data in the questionnaires contained narrative responses, and none of the teachers chose to add narrative data. Additional ideas included what teachers reported that occurred after returning to the classroom.

The voluntary nature of providing the teacher Learning Logs allowed privacy in sending the teacher learning logs. The use of an electronic participation format allowed for even more privacy, time to participate away from the work environment, and a neutral spot for answering all questions. The researcher knew no participants except for those participants at her own school and functioned in no supervisory capacity. At no time were any participants influenced to participate in the study.

The Teachers' Attitude and Demographics Questionnaire and the Teacher's Perception Questionnaire were administered electronically and concurrently using the electronic Survey Monkey, and were delivered directly to the private emails of the participants. The participants reviewed their answers to add or change their responses, but they were prohibited from reentering the questionnaire once they exited. The Teachers' Attitude and Demographics Questionnaire and partially close-ended Teacher's Perception Questionnaire took approximately 15 to 30 minutes to complete, and participants had a 2 week window within which to respond. The information emerging from the Teachers' Attitude and Demographics Questionnaire and partially close-ended Teacher's Perception Questionnaire reflected whether teachers felt their needs were addressed through professional development. Data analysis occurred after participants submitted their Learning Logs and completed the two questionnaires (Creswell, 2009; Merriam, 2009). Survey Monkey services organized and tallied the data in a usable format that was used for analysis purposes. One of the goals of this study was examine teachers' reports on their experiences on how technology training impacted student technology immersion and changed or might change their teaching strategies. Question designs created definitive answers through choices or individual responses.

Data Analysis

The software program from Survey Monkey was used to organize the data for analysis purposes. The percentages of participants for each category were put into their data base and organized for the study's purposes. Fifteen of the 20 participants responded to the emails after they were chosen by the principal to participate in the study. The two Questionnaires and the Learning Logs data were put into the Excel spreadsheet for data

analysis. This reduction allowed for putting the data in patterns. The data from Teachers' Attitude and Demographics Questionnaire, Teacher's Perception Questionnaire, and personal responses in the teacher Learning Logs were triangulated with one another to increase the qualitative validity and trustworthiness of the evidence (Creswell, 2009). Only information from the Learning Logs was redacted and coded for confidentiality upon receipt. The questionnaires did not need redacting or recoding because the data was received anonymously. Due to the narrative exploratory nature of this study, discrepant cases were not an issue.

The data triangulation served to strengthen the trustworthiness and accuracy of this study. Two questionnaires and teacher Learning Logs were used to explore whether technology immersion was fully occurring after technology-based professional development. Data were collected from teacher Learning Logs and put into categories according to similar narrative responses. This data was then compared with the two researcher-developed questionnaires to find similar patterns among the data sources. The three sources provided support for the findings and patterns that might give new topics for discussion regarding technology immersion in the classroom.

Limitations

Limitations to the study included teachers not adding the personal experiences to the Teacher's Perception Questionnaire and teachers' participants not disclosing personal experiences. Other limitations included teachers' reports on their use of technology that reflected a misunderstanding of what technology immersion was. For example, teachers reported the use of a computer to record attendance as technology immersion in the classroom, which is a practice that does not include the student and does not exemplify

technology immersion. Teachers volunteering to add their own narrative to the Teacher's Perception Questionnaire was a limitation to the study. The deep thinking and time commitment must be an element of commitment by the teachers (Dillman et al., 2009). Obtaining accurate information using the Teachers' Attitude and Demographics Questionnaire and partially close-ended Teacher's Perception Questionnaire provided dependability in the responses separate from the archival Learning Logs. An overall limitation of the Learning Logs was that some teachers completed the Learning Logs immediately upon completing professional development and submitted them to the schools and district for credit without implementing the strategy into the classroom. They had not had time to assess the impact on student learning.

Results

This study, using qualitative, narrative exploratory design encompassed 5 of the 10 high schools in the district (Stake, 1995; Yin, 2008, 2011). Four participants from four major departments at five high schools were asked to voluntarily participate in the study after completing district professional development Learning Logs for district credit. A purposeful sample voluntarily participated in the study. The research questions focused on how professional development increased the use of technology. Additionally, the research questions focused on the changes in teaching strategies, the impact of district support in preparing students for 21st century skills, and the impact on student success in the classroom. Frequencies and percentages for participant characteristics are presented in Table 1.

Table 1

Percentages for Participant Characteristics (SQ6)

Characteristic	*n*	*%*
Gender		
Male	4	27
Female	11	73
Core Course		
Math	2	13
Science	3	20
English	5	33
Social Studies	5	33

Note. Percentages may not total 100 due to rounding error.

The age of the participants ranged from 25 to 47 and the participants mean age was 33.3. Years of teaching experience ranged from 25 years and mean years of experience was 10. 4 years. To address research questions one through four, percentages were presented to examine the participants' responses to the questionnaire items. For all questionnaire items, participants were able to endorse more than one response option. Teacher's Attitude and Demographics Questionnaire question six stated, "My teaching background includes technological education training that addresses my teaching needs. "Narrative response options included "no formal training using technology", "one to three workshops/classes of technology training", "four to ten workshops/classes of technology training", "more than ten workshops of technology training", "personal or university training only", and "other personal experiences." Eighty-five percent of participants indicated they have received "one to three workshops/classes of technology training." Of the 27% who indicated "other personal experiences", those elaborations included "personal interest", "colleagues sharing what they have learned", "my school has limited access to technology", and "I desire to teach myself what was not taught." Participant responses are presented in Table 2.

Table 2

Percentages for Participants Technical Teaching Background (SQ 6)

Responses	*n*	%
No formal training using technology	1	7
1 - 3 workshops/classes of technology training	8	53
4 - 10 workshops/classes of technology training	5	33
More than 10 workshops of technology training	1	7
Personal or university training only	1	7
Other personal experiences	4	27

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 7 asked, "What are professional development programs that taught you how to integrate technology into your classroom? "Response options included "none", "workshops alone", "workshops followed by technical support", "support and interaction from other teachers", and "other personal experiences." Over 8% of the participants indicated "support and interaction from other teachers." Of the 13% of participants who indicated "other personal experiences", half indicated a dislike for workshops that only tell how to use the technology, but do not show the learners how to use it. The other half elaborated on the best experience, indicating that it was an "intense workshop that included follow up support. " Participants were given the opportunity to add additional personal responses from question 6 to question 25. None of the participants chose to add additional information but chose to select the provided answers. Participant responses are presented in Table 3.

Table 3
Percentages Professional Development Programs That Taught Technology Integration (SQ7)

Responses	n	%
None	2	13
Workshops alone	6	40
Workshops followed by technical support	7	47
Support and interaction from other teachers	8	53
Personal experiences	2	13

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question eight stated, "My professional development experiences include which of the following characteristics? "Response options included "workshops linked to overall school improvement and increased student achievement," "meets the needs in my content area," "was a positive experience," "strategies easily adapted to classroom," "provides practical instructional technology student-directed strategies", "connects new concepts to prior knowledge", "is important effective use of my time," "make long lasting changes in my teaching," "helps me impact student learning in a positive way", "projected knowledge and skill focus was clear", "other characteristics of technology professional development that I have attended." Seventy-three percent of the participants indicated "workshops linked to overall school improvement and increased student achievement", "strategies easily adapted to classroom", and "helps me impact student learning in a positive way." Of the 13% of the participants who indicated "other personal experiences", half stated "participation in as much professional development as possible to further skills and abilities"; while half said "most technology, base training revolves around data retrieval and not student achievement." Participant responses are presented in Table 4.

Table 4

Numbers and Percentages for Professional Development Experiences (SQ 8)

Responses	*n*	%
Workshops linked to overall school improvement and increased student achievement	11	73
Meets the needs in my content area	8	53
Was a positive experience	8	53
Strategies easily adapted to classroom	11	73
Provides practical instructional technology student-directed strategies	3	20
Connects new concepts to prior knowledge	5	33
Is important effective use of my time	8	53
Make long lasting changes in my teaching	7	47
Helps me impact student learning in a positive way	11	73
Projected knowledge and skill focus was clear	3	20
Other characteristics	2	13

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question nine stated, "Teaching strategies from technology-based professional development have changed to "include many types of teaching strategies." Response options included "individual strategies to help students", "group activities led by students", "student-directed strategies", "teacher-directed strategies", "cooperative learning (student-focused strategies)", "student interactive strategies using technology", and"other technology strategies." Fifty-three percent of the participants indicated "cooperative learning (student-focused strategies)" and "student interactive strategies using electronics." Of the 20% who indicated "other technology strategies", one-third stated "the use of technology to advance students" and "demonstrate their skills through group projects while utilizing technology", while two-thirds did not have such a positive outlook. Seven percent said the only technology professional development attended involved testing and correlating data and 7% stated that professional development concerning

technology does not work in large groups. Participant responses are presented in Table 5.

Table 5

Percentages for Teaching Strategies From Technology-Based Professional Development (SQ 9)

Responses	*n*	%
Individual strategies to help students	6	40
Group activities led by students	5	33
Student-directed strategies	7	47
Teacher-directed strategies	6	40
Cooperative learning, student focused strategies	8	53
Student interactive strategies using technology	8	53
Student-directed technology-based activities	6	40
Other technology-based strategies I have learned	3	20

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 10 stated, "Please identify any problems that impact the use of technology in the classroom. " Response options included "not enough equipment", "computer difficult to access", "programs too difficult to use", "not enough time to plan use in the classroom", "inadequate training", "inadequate support when problems occur", "technology has not been an issue", and "other personal experiences with problems." Eighty percent of the participants indicated "not enough equipment." Of the 33% of the participants who indicated "other personal experiences with problems", all noted some sort of issue with access to the technology. Some examples of the statements include "limited access to computer labs", "outdated equipment", and "limited technology available to our students." Participant responses are presented in Table 6.

Table 6

Percentages Identifying Problems Impacting the Use of Technology in the Classroom (SQ 10)

Responses	*n*	%
Not enough equipment	12	80
Computer difficult to access	10	67
Programs too difficult to use	2	13
Not enough time to plan use in the classroom	9	60
Inadequate training	5	33
Inadequate support when problems occur	5	33
Technology has not been an issue	1	7
Other personal experiences with problems	5	33

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 11 asked, "What is an effective approach to using technology strategies in the classroom? "Response options included "use only when I have time", "use when fits the subject matter", "make it a daily part of teaching strategies", "only allow students to use at home", and "other personal experiences." Sixty percent of the participants indicated both "use when fits the subject" and "make it a daily part of teaching strategies." No participants indicated "only allow students to use at home." Of the 13% of the participants who indicated "other", 7% of the participants indicated the "use of technology almost daily. " Another 7% indicated the "use of technology when it will enhance instruction or further support student achievement." Participant responses are presented in Table 7.

Table 7

Percentages for What Is an Effective Approach to Using Technology Strategies (SQ 11)

Responses	*n*	%
Use only when have time	2	13
Use when fits the subject matter	9	60
Make it a daily part of teaching strategies	9	60
Only allow students to use at home	0	0
Other personal experiences	2	13

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 12 asked, "Student success has changed in a positive or negative way due to the use of technology." Response options included "somewhat", "a measurable improvement in scores", "has resulted in lower measurable scores", "clearly improved success", "none at all", "student class grades have improved", "has resulted in lower standardized scores", "unable to measure effect", "have not noticed a change", and 'other personal experiences." None of the participants indicated a full explanation of their definition of scores being either "standardized testing or class scores. " Forty-seven percent of the participants indicated "a measurable improvement." No participants selected "have resulted in lower standardized scores" or "have not noticed a change." The participant who indicated other said that "technology is used throughout the course," and although it cannot be determined if the scores have changed due to technology, the students are "passionate about using the technology." Participant responses are presented in Table 8.

Table 8

Percentages for How Student Success Has Changed (SQ 12)

Responses	*n*	%
Somewhat	4	27
A measurable improvement in scores	7	47
Has resulted in lower measurable scores	1	7
Clearly improved success	1	7
None at all	1	7
Student class grades have improved	1	7
Has resulted in lower standardized scores	0	0
Unable to measure effect	3	20
Have not noticed a change	0	0
Other personal experiences	1	7

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 13 stated, "Classroom application of technology strategies have changed in my classroom as a result of technology-based professional development." Response options included "very little", "as a direct result of professional development", "have had no impact on my teaching", "has decreased because technology not worth the time", "the professional development does not help me use technology", and "other personal experiences." Sixty percent of the participants indicated "as a direct result of professional development." No participants selected has decreased because "technology not worth the time. 'The participant who indicated other said that the "technology was demonstrated and was explained how it was used, but no practice with the technology was given." Participant responses are presented in Table 9.

Table 9

Percentages for The Changes in the Use of Technology Strategies (SQ 13)

Responses	*n*	%
Very little	4	27
As a direct result of professional development	9	60
Have had no impact on my teaching	2	13
Has decreased because technology not worth the time	0	0
The professional development does not help me use technology	2	13
Other personal experiences	1	7

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 14 stated, "I have grown in my use of technology in several ways." Response options included "emails to students and parents", "electronic grade book use", "LCD projector", "video sharing to enhance lessons", "electronic writing tablets", "social media sharing such as Facebook", "blackboard assignments and discussions", "electronic pens", "Skype and other interface programs", "Quizdoms and other electronic testing technology", "teacher generated class website for student use", "student computer use to teach student-directed lessons on a consistent basis", "very seldom use technology except for record keeping", and "other technology." All of the participants indicated "emails to students and parents." No participants selected "very seldom use of technology except for record keeping." The participants who indicated "other" said that they used various other uses of technology through the web and through other software. Participant responses are presented in Table 10.

Table 10

Percentages for How Participants Have Grown in Their Use of Technology (SQ14)

Responses	*n*	%
Emails to students and parents	15	100
Electronic grade book use	14	93
LCD projector	15	100
Video sharing to enhance lessons	9	60
Electronic writing tablets	3	20
Social media sharing such as Facebook	5	33
Blackboard assignments and discussions	10	67
Electronic pens	2	13
Skype and other interface programs	1	7
Quizdoms and other electronic testing technology	3	20
Teacher generated class website for student use	3	20
Student computer use to teach student-directed lessons on a consistent basis	6	40
Very seldom use technology except for record keeping	0	0
Other technology	4	27

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 15 asked, "What issues are you experiencing as a teacher using technology? "Response options included "programs too difficult to use", "not enough time to plan for technology use", "not enough support when problems occur", "none", and "other personal experiences." Sixty percent of the participants indicated "not enough time to plan for technology use." The participants who indicated "other" said the technology available is just "not usable, " or that the "technology that teacher's use is their own." Participant responses are presented in Table 11.

Table 11

Percentages for Issues Teachers Experience Using Technology (SQ 15)

Responses	*n*	%
Programs too difficult to use	1	7
Not enough time to plan for technology use	9	60
Not enough support when problems occur	8	53
None	2	13
Other personal experiences	2	13

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 16 stated, "I feel that I have grown as an educator through the use of technology and student-directed activities." Response options included "I frequently use computers and electronic equipment", "I try to incorporate when equipment is available", "I avoid the use of electronics and students working together", "a student directing their own learning through technology does not prepare students for their future",
"students benefit from student-directed technology assignments", "the content are does not lend itself to technology student-directed activities", "it is important that the teacher direct all activities in the classroom", "students have become more sophisticated in technology and benefit from student-directed activities", "student input into the curriculum benefits learning", "my teacher-directed strategies were successful and will be in the future", and "other personal description" were the chosen responses.

Seventy-three percent of the participants indicated they "frequently use computers and electronic equipment." No participants selected "avoiding the use of electronics", "students working together", "student directing their own learning", "technology does not prepare students for their future", "it is important that the teacher direct all activities in the classroom", and "other." Participant responses are presented in Table 12.

Table 12

Percentages for Teacher Growth Using Technology (SQ 16)

Responses	*n*	%
I frequently use computers and electronic equipment	11	73
I try to incorporate when equipment is available	10	67
I avoid the use of electronics and students working together	0	0
A student directing their own learning through technology does not prepare students for their future	0	0
Students benefit from student-directed technology assignments	10	67
The content are does not lend itself to technology student-directed activities	1	7
It is important that the teacher direct all activities in the classroom	0	0
Students have become more sophisticated in technology and benefit from student-directed activities	9	60
Student input into the curriculum benefits learning	7	47
My teacher-directed strategies were successful and will be in the future	4	27
Other personal description	0	0

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 17 stated, "I have grown in my use of technology and technology immersion in several ways." Response options included "emails to students and parents", "electronic grade book", "LCD projector", "video sharing to enhance lessons", "electronic tablets", "social media sharing such as Facebook", "blackboard assignments and discussions", "electronic pens", "Skype and other interface programs", "Quizdoms and other electronic testing technology", "class websites for student use", "student computer use on a consistent basis", and "seldom use technology." One-hundred percent of the participants indicated "emails to the students and parents." No participants selected "Skype and other interface programs" or "other." Participant responses are presented in Table 13.

Table *13*

Percentages for Participants' Growth Through Reflection (SQ 17)

Responses	*N*	%
Emails to students and parents	15	100
Electronic grade book	14	93
LCD projector	14	93
Video sharing to enhance lessons	6	40
Electronic tablets	2	13
Social media sharing such as Facebook	5	33
Blackboard assignments and discussions	9	60
Electronic pens	2	13
Skype and other interface programs	0	0
Quizdoms and other electronic testing technology	2	13
Class websites for student use	3	20
Student computer use on a consistent basis	6	40
Very seldom use technology	0	0

Note. Percentages do not total 100 because participants endorsed more than one option.

Sixty-seven percent of the participants indicated that professional development showed them "how to use technology and gave them new ideas on how to plan daily activities." The confidence level of 53% of participants "had increased" while only 20% of participants did not feel they had "enough information to carry technology back to the classroom and implement it in their daily activities. " Fifty-three percent did say they "had increased their confidence level for using technology. " No participant selected the option that "professional development met their other personal technological needs. " Participant responses are presented in Table 14.

Table 14

Percentages for Completing Professional Development Programs (SQ 18)

Responses	*n*	%
Showing me how to use technology	10	67
Giving me new ideas to plan daily activities	10	67
Increases my confidence using technology	8	53
Do not give me enough information to carry back to the classroom	3	20
Other personal technology needs	0	0

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 19 asked, "How does technology support affect your consistent use of technology?" Response options included "it does not affect me at all", "it makes me feel as if I can overcome frustrations", "it creates additional stress and frustrations", "it is not useful at all", and "other personal experiences." Sixty percent of the participants indicated that "it makes them feel as if they can overcome frustrations." No participants selected "it is not useful at all." The participants who indicated "other" indicated using only "technology that provided support, " that there was little to "no support given," or that there was "amazing support." Participant responses are presented in Table 15.

Table 15

Percentages for Participants Reflection of Consistent Technology Use Due to Support (SQ 19)

Responses	*n*	%
It does not affect me at all	5	33
It makes me feel as if I can overcome frustrations	9	60
It creates additional stress and frustrations	2	13
It is not useful at all	0	0
Other personal experiences	3	20

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 20 asked, "How does technology support affect your use of study-directed technology? "Response options included "it does not affect me at all", "it makes me feel as if I can overcome frustrations", "it creates additional stress and frustrations", "it is not useful at all", and "other personal experiences." Forty-seven percent of the participants indicated "it makes them feel as if they can overcome frustrations." The participants who indicated "other" said that if the "technology is not working properly, then the lesson can be a waste of time." Participant responses are presented in Table 16.

Table 16

Percentages for Participants' Use of Technology After Support (SQ 20)

Responses	*n*	%
It does not affect me at all	4	27
It makes me feel as if I can overcome frustrations	7	47
It creates additional stress and frustrations	3	20
It is not useful at all	2	13
Other	1	7

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 21 asked, "What has been the effect of technology immersion in the classroom in your experiences over the past several years"? "Forty-seven percent of the participants indicated the "use of technology has increased over the past several years" and "students seem to be more enthusiastic about learning when using technology." No participants selected "education has declined as students use technology", "using technology does not benefit student success", "technology immersion slows down the process of learning", or "technology student-directed activities have not benefited student learning." The participants who indicated

"other" said that when students use technology it readies them for their career. Participant responses are presented in Table 17.

Table 17

Percentages for Participant Reflection on the Effect of Technology Immersion (SQ 21)

Responses	*n*	%
Education has declined as students use technology	0	0
Using technology does not benefit student success	0	0
Technology immersion slows down the process of learning	0	0
The use of technology has increased over the past several years	13	87
Students seem to be more enthusiastic about learning when using technology	13	87
Technology immersion is too difficult to work into lessons	1	7
Technology student-directed activities have not benefited student learning	0	0
Teaching using the traditional methods of teaching benefits student success for the future	5	33
Immersing technology has increased over the past several years	9	60
My students have grown and benefited from technology student-directed activities	9	60
Being a part of preparing students for their technology future is rewarding as a teacher	7	47
Other personal factors	1	7

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 22 stated, "The culture of the school impacts my use of technology." Response options from 53% of the participants supported that t "the school culture make me feel comfortable using technology." Sixty percent stated that ", "teachers are encouraged to use technology, " while 33% stated "there are conversations and an excitement regarding technology use." Twenty-seven percent indicated "there is sometimes a reminder to use the computers", and 20% reported "the administrators does not seem to care whether or not technology is used." Thirteen percent responded that "teachers do not have an emphasis on technology strategies, "and 7% reported that "no one cares how teachers teach or the strategies teachers use. "No

participants indicated that "it is unclear the attitudes the school has toward technology." No participants indicated "other." Participant responses are presented in Table 18.

Table 18

Percentages for How Technology Impacts School Culture (SQ 22)

Responses	*n*	%
The school culture make me feel comfortable using technology, student-directed strategies	8	53
There is sometimes a reminder to use the computers	4	27
There are conversations and an excitement regarding technology use	5	33
The administrators does not seem to care whether or not technology is used	3	20
Teachers do not have an emphasis on technology strategies	2	13
Teachers are encouraged to use technology	9	60
No one cares how teachers teach or the strategies teachers use	1	7
It is unclear the attitudes the school has toward technology	1	7
Other additional observations	0	0

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 23 stated, "The district's 21st century technology emphasis is supported through our professional development." Eighty percent of the participants indicated, "by encouraging the use of technology." Of the participants who indicated "other", 7% said "unsure", and 7% said, "technology is not pushed within the district." Participant responses are presented in Table 19.

Table 19

Percentages for District's 21st Century Technology Support (SQ 23)

Responses	*n*	%
By offering opportunities for technology use	7	47
By encouraging the use of technology	12	80
By constantly asking what is needed by teachers	1	7
Is not supported at all	2	13
Other.	2	13

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher's Perception Questionnaire question 24 stated, "Technology skills will be needed by all students in the future in order to be successful in a digital world. "Ninety-

three percent of the participants indicated “technology skills are essential for all students.” No participants selected “technology will not make a difference in student success” ,“technology will be a passing fad in society”, and “students simply need to read and write and they will be successful.” The participants who indicated “other” said technology is beneficial but not all students will need technology to be successful. Participant responses are presented in Table 20.

Table 20

Percentages for Technology Skills Needed by All Students (SQ 24)

Responses	*n*	%
Technology skills are essential for all students	14	93
Technology will not make a difference in student success	0	0
There is not enough technology in the world to make a difference	2	13
Students will be successful whether or not they are technologically proficient	1	7
Technology will be a passing fad in society	0	0
Students simply need to read and write and they will be successful	0	0
Other	1	7

Note. Percentages do not total 100 because participants endorsed more than one option.

Teacher’s Perception Questionnaire question 25 stated, “Through my reflections on my responses to these questions and responses”, “I feel as if I have changed my teaching strategies after technology-based professional development.” Response options included “I have changed my teaching strategies”, “my teaching strategies have not changed” , “my teaching strategies will change in the future”, “I am not sure if my strategies have changed”, “I am not sure if strategies need to change”, and additional comments. Sixty percent of the participants indicated “I have changed my teaching strategies.” No participants selected “I am not sure if strategies needed to change.” This

table indicates that the majority of teachers feel that technology skills are essential for all students. Participant responses are presented in Table 21.

Table 21

Percentages for Participants' on Change in Teaching Strategy (SQ 25)

Responses	*n*	%
I have changed my teaching strategies	9	60
My teaching strategies have not changed	3	20
My teaching strategies will change in the future	6	40
I am not sure if my strategies have changed	1	7
I am not sure if strategies need to change	0	0
Additional comments	1	7

Note. Percentages do not total 100 because participants endorsed more than one option.

Learning Logs From District Technology-Based Professional Development

Teachers used Learning Logs (Appendix G) to record their experiences after professional development. These Learning Logs were archived by the district. Fifteen teacher Learning Logs were assessed for emerging patterns among the narrative responses provided. These Learning Logs provided the only narrative responses provided by the participants. The Learning Logs topics included the title of the professional development activities and its description, concepts and strategies, learned classroom applications to possibly increased student achievement, and reflections, evaluations, and assessment of the activity.

The Learning Logs indicated that only 29% of the participants recorded the professional development training as a technology-based professional development. This lack of responses alluded to teachers misunderstanding why they were taking the professional development. The teacher Learning Logs responses showed that 13% of the participants reported the professional development was a writing training, 13% indicated

the training was leadership training, and 6% indicated the training was an alternative assessment workshop. Thirty-two percent of the participants were actually doing specific technology training activities but did not relate their training to technology training immersion. Furthermore, participants did not consciously recognize that 100% of their activities were technology-based and the professional development training was completed using the computer teaching participants' strategies to immerse technology into the classroom.

When participants described the technology-based training on the Learning Logs, the responses were varied. Twenty percent of the participants indicated that the training dealt with the retrieval or organization of data, 27% described the training as being geared around software and 20% indicated the training was designed around web-based software programs. Again, some participants did not consciously recognize the professional development training as technology-based training or as technology immersion training.

In response to the concepts/strategies that were used during the professional development training, 60% of the participants indicated that the goal was to learn to utilize technology platforms for integration into the classroom. Thirteen percent of these participants indicated that data could be used as a way to standardize scoring for writing, and 13% indicated that the technology allowed them to access data that allowed students to track their progress. Fifty-three percent of the participants indicated that the professional development was a type of tutorial for Internet based technology and software. Some of the software and technologies mentioned by participants were PowerPoint, Blackboard, Zimbra, EDinsight, and Quizlets. Participants reported using

technology in the training, but teachers did not record the training as technology-based immersion.

When asked about the classroom applications as a result of the training, three patterns of applications were recorded by the participants. Those patterns were (a) improve student achievement, (b) to create and to teach lessons, and (c) manage data and monitor student progress. Twenty percent of the participants indicated the professional development training applied to the classroom because it taught them how to improve student achievement. Two thirds of those participants indicated the training would help students improve their writing skills, and one-third indicated that they used student blogs to help the students understand the classroom instruction better (Richards, 2010). Forty percent of participants indicated the professional development training helped them create and teach lessons. Seven percent of the participants indicated that the current available technology training helped them easily create lessons to keep students interested so they enjoy learning while using technology. Seven percent indicated that some of the programs helped students reviewing for tests, and 7% said technology helped student complete in class assignments. Twenty-seven percent wrote that technology allowed them to manage data and monitor grades while 21% stated that they were better able to monitor the work and progress of the students.

Four patterns in regards to reflection were found among the participants' responses. Those patterns were "students better analyze their own work", "teachers analyze data", "teachers' face obstacles", and "technology promotes achievement." The first pattern, "students better analyze their own work", showed 13% of the participants indicating that implementation of what they learned to the classroom environment has

taught the students to be more critical of their own work, and thereby encourages their improvement. The second pattern, “teachers analyze data”, showed 13% of the participants indicating that it is now easier to analyze the data they have. The third pattern, “teachers face obstacles”, showed 13% of the participants indicating there were obstacles to the technology that was available to them. Not all students had access to computers. Seven percent of the participants stated that if students did not have access to computers then teaching the computer skills to them was worthless. Additionally, 7% of the participants stated that access to technology cannot be made mandatory because of differences in education and economic levels among the students. The fourth pattern, “technology promotes achievement”, showed that 27% of participants reflected that the implementation of what they have learned promoted achievement, 7% said ELMO (document camera) has been invaluable and the technology-based literacy strategies, graphic organizers, and thinking maps were used regularly. Seven percent stated that students are intrigued by the use of technology in the classroom because the technology helps them enjoy the learning process. Another 7% stated that technology promotes achievement for the teachers and the training was a success. Table 22 addresses the results of the patterns in the Learning Logs.

Table 22

District Teachers' Narrative Learning Log Patterns

Patterns that Emerged	%
Activity	
Technology	4
Description of Activity	
Retrieval or organization of data	3
Software usage	4
Web-based software programs	3
Concepts/strategies	
Utilize technology platforms for integration in the classroom	9
Tutorial for Internet based technology and software	8
Classroom applications	
Improve student achievement	3
Create and teach lessons	6
Manage data and monitor student progress	4
Reflection	
Students are intrigued by technology	7
Promote achievement	4

Participants' reported that the strategies helped "teachers drive instruction" and "reduce variance in writing scores." The Learning Logs data showed participants desire to "strive to stay current on the Department of Education updates on writing" and meet the demands to "continually analyze and address data" while maintaining a normal classroom environment. One participant reported that "the uses of rubrics on the computer helped students understand information and helped them have control of where they need to move as learners." One participant wrote for students to "better monitor activity in the computer lab through rubric usage…to look what is expected in a writing assignment…to accurately writes for an assignment." This participant further reported that the element of "electronic rubrics with numbered documents with specific rubrics for each document measures effectiveness of the written work" have helped save teaches

time. Another participant wrote that the training generated a number of interesting alternatives to traditional assessments and wrote, “Students have varied interests and strengths so it is important to diversify our assessments.”

The pressure to “flip the classroom” had become a reality for one teacher. She stated that she could create a Pencast (electronic SmartPen) for handwritten Notes and audio recording) upload to Blackboard (course management system), create a file, and send to students through emails and Facebook. She had them do their homework in class and master the concepts at home. She can then answer the questions of when and why in class rather as homework. Another teacher created various atomic models through history using Pencasts that were taught in class and then made them available for students to use for references at home via their computers. A third teacher reported that the use of the SmartPen (digital pen) and Podcasts (digital media file). have created the ability to easily create the lesson from home and allows him the ability to “flip the classroom” by requiring they view the lesson at home and quickly complete the assessment in the classroom. It has created many more options for teaching higher level students.

Teachers of the lower quartile students (students not passing the state test in the 8^{th} or 10^{th} grades) used technology to improve the critical thinking to improve test scores of these at-risk students. They stated that they tied old information with new information by spiraling the old with the new through digital programs to probe their thinking and extend it to make connections to their experiences. They stated that they had multiple resources to help the students make multiple connections. For these struggling students, making connections was an improvement in learning as having background knowledge is

often the key to knowing. Several teachers of lower quartile classes stated that technology benefited their students.

Several teachers reported using Wikispaces and Gloster to present and communicate with the teacher and other students. These teachers also used Prezi, an enhanced format for presenting projects. One teacher stated, "Students applaud the change from PowerPoint. These technology tools are great tools to help teachers educate students who are part of the Facebook generation. I have also required students make Prezi and blogs for projects, and they have enjoyed doing so. This same teacher reported using "PowerPoint Transitions, Quizlets into PowerPoints and Text-Anywhere within PowerPoint and Smartboard with PowerPoint." She reported using these skills in her classroom on an on-going basis. She wrote:

> The use of Smartboard technology allows for students to be involved hands on and see how technology can be fun. Rather than a simple screen that just uses markers, the Smartboard allows for students to crop, cut, paste, play with, and develop Interactive scenes. PowerPoints are created with dynamic minded approaches and a Prezi allows for student involvement as well. Integrating Text Anywhere concepts and or markers for student questions or short answer response allows for me to create PowerPoints that students enjoy, are part of, and apply to their learning.

She further wrote, "The [technology professional development] training …'the launching pad of training' was a success, and one in which I would suggest to any teacher wanting to advance themselves."

A teacher at another school used Quick Response Codes and Polls Everywhere to quickly post in the classroom with titles about various student work, or access student videos or projects. The codes can easily be used to access student ePortfolios, assignment reminders, pull up quick student reminders, opinion, or reviews. Remind 101 can quick send notes to students for reviews or test reminders.

Another teacher wrote that he has used a lot of technology with his Advanced Placement and honors classes. He stated:

> I have not been successful using them with his standard classes. Students refuse to use any type of technology at home. They will not access the Blackboard system at home and take advantage of the opportunities offered to them to learn. The socioeconomically disadvantaged have a real obstacle in their way of using technology.

This was reflected in the reports of several other teachers, but not expanded on to any degree.

Additionally, one teacher wrote:

> Using technology to teach teachers how to use technology will help students feel more modern and actively engage them. Teachers that are bored with technology will not use it in the classroom. One on one application is needed instead of large group instruction. Not having computers when needed makes teaching how to use computers worthless.

This teacher also wrote, “Labs must be made available so teachers can work with their students or teachers revert back to lecture/notes due to the lack of access.” Additionally, several other teachers noted that there were not enough labs and technical support in the

schools." One teacher stated the following, listing the following items that teachers are trained to use in the classroom:

> All of the following technology software/hardware was discussed in this 15 hour PD with respect to effective application within the classroom to enhance student learning & improve classroom management:
>
> **Microsoft Office (Word, Excel & PowerPoint)** – not just as a way to present material but to assist in Lesson Planning & classroom management e.g. **PowerPoint (PP**) with hyperlinks to other materials & interactive student question and answers.
>
> **Skyward** – to take Attendance, make Seating Charts, contact parents, student advisors & students directly, keep a Grade Book, prepare Attendance & Grade Reports & send out, view student records & parent access.
>
> **Edinsight** – to view student data, make reports on these data including graphs
>
> **Exam View** – creation & sharing of tests with other educators & use of these in Blackboard.
>
> **I-Observations** – MARZANO TEACHER EVALUATION - management of Professional Development Plans & setting of targets and viewing of Administrator's Observation Data.
>
> **Blackboard** – how to link assignments in Blackboard (BB) and to use to manage classes e.g. work for students who have been absent & weekly posting of Lesson Plans.
>
> **Zimbra** – communication with other teachers, students & parents.

Edmodo – using this Social Media based communication software that is similar to Facebook, with your classes in a productive way.

Discovery Education – to view student data, make reports on these data including graphs and to manage & administer student assessments.

Online Simulations for Science e.g. Ph. E.T. – ways to involve Virtual Labs & simulations in Science classes to enhance student learning.

E-Clicker – use in class for instant visual results for student surveys, assessment, polling etc.

Polls everywhere (mobile phones) - use in class for instant visual results for student surveys, assessment, polling etc.

The one element that was consistent in all responses was the use of district emails and district grading systems. The district now relies on more emails and posts videos and PowerPoint training and video training on the district and school websites for teachers to access. There is abundance, and it has become challenging for teachers track the technology.

Findings

Data were generated through archival Teacher's Attitudes and Demographics (Appendix E), Teacher's Perception Questionnaire (Appendix F), and Learning Logs (Appendix G). Data were gathered through the electronic Survey Monkey and participant Learning Logs. Survey Monkey tallied the questionnaire data and provided spreadsheets, and I completed Excel spreadsheets of the Learning Log patterns. The patterns listed were the ones that most often occurred. Narrative data was also provided by participants on the Learning Log.

The data analysis explored participants use of technology in the classroom and how they implement new skills into instruction. The purpose and goals included an exploration of the relationship between professional development and technology immersion through changed classroom strategies that increased student learning. The ultimate goal was to improve student learning in the 21st century.

This exploratory study design allowed for maximizing data used in the study and maximized the ability to interpret the data (Onwuegbuzie & Leech, 2006; Stake, 1995; Yin, 2008, 2011). One of the arguments supporting qualitative research allowed for realism and an understanding of what participant's reported occurred and not simply a measurement of numbers. The information from the qualitative archival Learning Logs, along with participant responses to the questionnaire questions, gave narrative insight into the types of professional development that resulted in integration of technology into the classroom.

The frequencies of the same type of question gave insight into agreement and changes. It created the ability to compare answers based on the years teaching and courses taught. The focus on the research questions reflected the student-directed activities in the classroom, the attitude of teachers toward technology, and the changes teachers saw in their teaching. The data also provided a view of the types of technology available to participants and allowed participants to evaluate if they are effectively using the technology in the classroom. Gaining insight into changed practices due to technology and professional development gives useful data to school and district administrators, teachers, and community stakeholders. The data also provided data on the types of technology available to participants.

Responses from the Teacher's Perception Questionnaire gave give insight into participants' attitudes regarding the use of technology with an option for personal experiences. The participants were given the option of the personal responses, but none chose to add personal responses. All data collected was from the selection of answers provided for teachers. The questions from the Teacher's Perception Questionnaire correlated with the research questions, creating consistency between the goals of the study and the data used. Software usage did not allow for the depth of information necessary to understand the impact of professional development. Triangulation allowed for depth even with a limited convenient sample. The best possible accuracy of the findings through triangulation and peer review ensured procedures remained in place for obtaining the best possible answers. Any discrepancies in questions were marked to be handled immediately.

A summary of the overall trends provided an understanding of where one score falls in relation to other score. Attitudes and behavior trustworthiness and understanding reflected the immersion of technology into the classroom after professional development. The personal participant insights could have provided narrative details for consideration, but none of the participants chose to add additional personal data. The additional demographic information showed the frequency of attitudes between core departments in responses through frequency using narrative analysis techniques. Each of the three data collection methods supported the findings of the others, thus showing accuracy of immersion. The patterns and relationships were supported in all the data. This data supported the value of teacher reflections on changing teaching strategies due to technology immersion.

Through the results of four research questions, the data showed that technology skills were essential to both teachers and students alike. Thirteen of the 15 participants indicated through the provided selections that they had participated in one to ten workshops or classes of technology training and one participant even indicated participation in more than ten. Technology-based professional development provided the participants with the skill sets they needed to incorporate technology into the classroom. Eleven percent of participants said that the strategies that were learned in the professional development trainings were easily adapted to the classroom. Sixty percent of the participants indicated that the classroom application of technology strategies have changed in the classroom as a direct result of technology-based professional development.

Research Question 1

The first research question asked in what ways professional development best practices are most frequently used in the classroom because of the participants attending technology-based professional development. The Teachers' Attitude and Demographics Questionnaire data showed that participants increased the use of technology after attending professional development. The two questionnaire results showed that 60% of teachers now use technology. Sixty percent of participants perceived that their strategies have changed due to the use of technology. This percentage could indicate technology immersion success in the classroom. The Learning Logs were not specific enough to give data for this specific question. Participants reported what strategies they used because of the professional development, but did not indicate whether they increased their usage.

Research Question 2

The second research question asked how potential participant's perceived current technology-based professional development they received and the impact on the use of technology-based teaching strategies. The Teachers' Attitude and Demographics Questionnaire results revealed that technology-based professional development was highly effective in changing teaching strategies. The Teacher's Perception Questionnaire results showed that participants selected all eight of the strategies. Fifty-three percent of participants reported they used two of the eight strategies, cooperative learning and student interactive strategies. Forty percent used individual strategies, 47% used teacher directed strategies, and 47% used student directed strategies. Thirty-three percent used student led group activities, while 20% reported they used other strategies. The Learning Logs reflected attendance and patterns of the activities and concepts and strategies learned, but failed to provide information about implementation over time. No teacher added additional information to the questionnaire. The Learning Logs were the only source of narrative data.

Research Question 3

The third research question asked how potential participants perceived the professional development provided by the district with the additional emphasis on 21st century learning. The Teachers' Attitude and Demographics Questionnaire showed that student-directed technology better prepared students for the 21st century. This same questionnaire results also showed that 25% of participants perceived technology application better prepared students for the future. The Teacher's Perception Questionnaire indicated that 47% of the participants perceived the district as offering

opportunities for increased technology knowledge while 8% encouraged the use of technology. The results indicated that 7% of participants perceived the district continually asked what was needed by teachers. Additionally, 13% of participants perceived that the district did not support the use of technology. No teacher followed this up with a further explanation in the portion of the questionnaire. The Learning Logs did not address 21st century learning.

Research Question 4

The fourth research question asked how technology-based professional development experiences affected student-directed technology strategies in the classroom. Six of the 12 questions on the Teachers' Attitude and Demographics Questionnaire addressed student-directed strategies. The responses indicated that teaching strategies changed. The Learning Logs indicated that 100% of participants perceived professional development activities increased student-directed activities because of the training they attended. This change in perceptions might suggest technology-based professional development is changing education.

The Teacher's Perception Questionnaire results showed an increase in student-directed strategies in the classroom through the response data only. No teachers followed up the questionnaire with responses. Fifty-three percent of participants perceived an increase in cooperative learning, 47% of participants perceived an increase in student interactive strategies, and 33% an increase in student led group projects. The response data showed that 47% of participants perceived that student-directed technology-based activities increased, while 60% of participants also showed that they now make technology a daily inclusion in their teaching strategies. Sixty percent of the participants

indicated that students benefited from student-directed technology assignments. No participants perceived that teachers should direct all the activities in the classroom. Learning Logs indicated that 60% of participants utilize technology platforms. The Learning Logs again indicated that 100% of the participants perceived professional development activities increased student-directed activities because of the training they attended. This was consistent with the previous research question. These results might suggest change in technology immersion has occurred.

Additionally, the questionnaires asked participants how student success rates changed as a result of immersing technology-based strategies. The Teachers' Attitude and Demographics Questionnaire teacher response data indicated that participants perceived student success increased as a result of immersing technology-based strategies in the classroom. The Teacher's Perception Questionnaire indicated 47% of participants perceived an increase in student success due to technology immersion in the classroom. Fifty percent of participants perceived that student grades improved due to technology-based strategies and "clearly improved success." No participants perceived that student success decreased as a result of technology-based activities. Additionally, the results showed that all participants perceived some sort of increase in student learning. No teacher followed up a response to the questionnaire. The Learning Logs indicated that 27% of the participants perceived that technology promotes achievement. Teachers felt that technology increases learning.

In reference to the use of the district's 21st century technology, 8% of the participants said that the emphasis comes in the form of encouraging the use of technology, and 47% of participants indicated they offer opportunities for technology

use. Ninety-three percent of the participants indicated that technology skills were essential for all students. In addition, 87% of the participants indicated that the use of technology has increased over the past several years and students seem to be more enthusiastic about learning when using technology. Technology has become a common function in the educational setting and could remain a core part of the learning process.

Triangulation Results

Through the Learning Logs, the participants indicated similar information, stating that the professional development allowed them to track and monitor students' progress more closely and allowed for the ease of creating lessons. Additionally, through item 12 from the Teacher's Attitude and Demographics Questionnaire, participants were asked whether classroom application of technology strategies had changed their classroom instructional practices as a result of technology-based professional development. In response to that question, nine of the teachers indicated that their "technology strategies" had changed as a direct result of professional development. On a similar note, item one from the Teacher's Attitude and Demographics Questionnaire asked whether technology-based professional development was "highly effective in changing teaching strategies." In response to this item, the participants responded that they "*agreed*". The Learning Logs supported that teachers' felt that professional development "changed teaching strategies."

The Teacher's Attitudes and Demographics Questionnaire asked whether increased classroom application of technology student-directed strategies increased student success. Participants responded between "*agree*" and "*strongly agree*," and indicated they believe that "student achievement increased due to the use of technology

in the classroom." From the Teachers' Attitude and Demographics Questionnaire asked whether "student success has changed in a positive or negative way due to the use of technology." In response to this question, 47% of the participants indicated that they felt that there had been a "measurable improvement in scores. " None of the participants indicated a full explanation of their definition of scores being either standardized testing or class scores. The Learning Logs data indicated they saw improvement in the student's work. Some participants indicated that "students are better able to critique their own work" and show improvement based upon the knowledge students gained because of the use of technology in the classroom.

In the Teacher's Attitude and Demographics Questionnaire, participants were asked whether technology immersion "better prepares students for the future." In response to this item, 14 of the 15 participants chose "*agree*" or "*strongly agree*", indicating support for technology in the classroom. Teacher's Attitude and Demographics Questionnaire asked whether technology skills would be needed by all students in the future in order to be successful in a digital world. Ninety-three percent indicated that technology skills were essential for all students. No participants indicated that technology skills "will not make a difference in student success," that "technology will be a passing fad in society," or that "students simply need to read and write to be successful." Endorsement or lack of endorsement for all of these items indicated that participants felt that technology was a very important part of the success of students in the digital world. Participant reports in the Learning Logs. The limitation to the Teacher's Perception Questionnaire was that very few teacher chose to add a textual response to the

questionnaire. The Learning Log textual evidence supported that "technology skills are needed by students."

As the patterns developed from the Learning Logs, they were reflected in the two questionnaires. Patterns emerged showing how teachers felt they implement technology into the classroom, their types of new activities, their primary focuses of the new activities, the classroom applications for immersion, and the assessments of the activities. These patterns aligned with the questionnaire questions and reflected the coded patterns of the Learning Logs. The questionnaire also allowed for emerging patterns regarding experiences using technology and student-directed activities. None of the teachers chose to report on their personal experiences on the two questionnaires, but chose to respond in their own words in the Learning Logs.

Conclusion

This qualitative exploratory study was an exploration of the immersion of technology after professional development. The study was a triangulated data collection through a convenient sample of teachers. A Teachers' Attitude and Demographics Questionnaire, a Teacher's Perception Questionnaire, and archival district Learning Logs were used to assess whether teaching strategies and teacher's attitudes have changed as a result of professional development.

This research design gave beneficial results and aid in improving professional development. It allowed administrators and school and district administrators, teachers, and community stakeholders to assess the effective inclusion of technology resulting from professional development from an overall study of teachers in five high schools. Descriptions of the types of support given and activities after professional development

provided insight into the effectiveness of professional development toward the integration of technology immersion and strategies. The Teachers' Attitude and Demographics Questionnaire, the Teacher's Perception Questionnaire, and the archival Learning Logs all gave a partial picture of the improvements in student learning immersion that showed a variety of professional development activities.

The result of the study was the discovery of educational transformation reflecting student success taking place in the classroom. Technology immersion had become more a part of the norm, but the variety of activities interfered with a common goal between teachers. The discovery assessed if technology-based learning strategies become a part of the standard for class instruction due to professional development activities that resulted in student success. These technology-based learning strategies might improve learning and save money for the district.

In order to compete successfully in the global economy, schools and school districts must continue teaching using technology strategies and showing the progress of students using advanced 21st century skills. *The Partnership for 21st Century Skills* (2008) felt teaching students how to think critically, solve complex problems, be creative, communicate, and take charge of civic and financial responsibilities helps the systems survive the test of time and alleviates employment demands. The summative results aid the schools and school district in making formative funding decisions toward effective professional development and technology inclusion that result in student success in learning. These professional development opportunities help students be prepared for the demands of employment in the future. This exploratory study using qualitative data might

help educators and stakeholders make informed decisions regarding professional development activities offered to teachers (Stake, 1995; Yin, 2011).

Howard Gardner (2007) emphasized that these eras of learners must undergo fundamental changes by obtaining the skills to be connected with others, to communicate with each other, live with one another, and create a common cause for each other. The synthesized and disciplined mind of connected learners must also be creative and ethical. With the instant access through technology, these skills must be taught and practiced through strategies and connections in the classroom (Bell, 2011). Teachers can better provide skills in demand for the 21st century student. The data collection meets the goals of the project and provide data for analysis of how technology-based professional changes education to be more student-directed.

Assessing the level of technology integration that benefits schools might help plan effective technology professional development and result in successful student learning. Twenty-first century society might benefit when students are technologically centered in a digital environment.

Section 3 presents the white paper for consideration by the district and gives the purposes of a white paper and benefits to using this genre for educational purposes. The white paper will give the suggestions for goals for future discussions, a time frame for implementations, and suggestions on how the white paper might help create social change. The overall outcome of the white paper is to build the capacity to further discussions that encourage collaboration and dialogue around the immersion of technology.

Section 3: The Project

Introduction

The system of education is moving toward total immersion into technology for students who are prepared for the 21st century (Banister & Fisher, 2010; Downes, 2012; Gleick, 2008). Technology-based professional development provided by the district might create opportunities for teachers to learn new techniques that would help them to implement student-directed strategies and technology-based activities. The findings from this study tentatively show that some change was occurring, but that technology immersion continued to elude the classroom. Teacher beliefs, along with a lack of programs that included technology support and a lack of equipment, disrupted the effort to promote total technology immersion in the classroom even after technology based professional development (Ertmer, 2005; Hess et al., 2010).

The school district used in this study had a district plan that required teachers to be trained in technology and include technology in their teaching strategies. The plan included the district funding future technology endeavors to meet the needs of teachers and students. The purpose of the research was to explore the degree to which participants were integrating technology into their instruction through the implementation of new strategies. The project that resulted from this research was a white paper that might aid the superintendent, school board, school teachers, and administrators in discussing technological immersion more broadly across the district. The white paper might aid in decision making with respect to infrastructure and resource allocation to equip educational professionals to engage in technology-immersed instructional practice. The white paper genre highlights necessary research information to make informal decisions.

The Problem and Solution through the White paper

The objectives of any white paper are to inform, educate, and persuade. A white paper helps stakeholders understand a problem and its solutions in a format that is easy to understand (Madden, 2009). This white paper helps to inform district stakeholders of the problem of inadequate technology immersion after providing training through professional development (Shapley et al., 2010; Wise & Jacobs, 2010). The need for a change in teaching strategies and the need to use massive amounts of information increases as technology grows in use. The challenge for the schools and the district in the study is to meet the district's vision of technology immersion and professional development goals to become partners in changing the classroom. This white paper format provides insight into the types of professional development teachers have attended and the immediate changes they have made in their teaching strategies, followed by additional insight by the same teachers immediately after they attended professional development. The white paper gives insight into how teachers felt toward using technology, which barriers teachers encountered, and how to increase the use of technology in the future in a more cost-effective manner.

Click (2013) suggested that educational systems that required new approaches used the basic white paper. Necessary information can be highlighted in a white paper to promote change within the system. Click (2011) also suggested five keys to an effective white paper were to (1) be aware of the audience, (2) describe the problem accurately, (3) make technical terms easy to read and understand, (4) make the examples easy to understand, and (5) focus on the interest of the reader. Hoffman (2013b) stated the white paper is an effective way to inform educators of the merits of technology products and

services. These documents provide useful information to the reader and lend trustworthiness to the solutions to a problem (Shadish, 2011). Educating decision makers becomes the function of a white paper, which helps to inform them that solutions are available. White paper reports are more likely to be disseminated within a system as departments enlist support for new initiatives (Hoffman, 2013a, 2013b, 2013c). White papers reach and inform an audience while informing and educating employees and partners. A white paper might convince technical decision makers that solutions actually work. The objective of the system can better be met with solutions based on a foundation of facts (MacArthur, 2008). Steinzer (2010) suggested that the white paper is a powerful tool and will aid decision makers in justifying and implementing solutions. Kemp (2005) suggested that the more simple the terminology used, the more easily decision makers will be convinced of the need for change. In creating the white paper for this study, I employed the suggestions of such researchers as Hoffman (2013a), Gordon and Gordon (2003), Graham (2013a; 2013b), and Kemp (2005). The white paper suggests that professional development needs be assessed, technology be provided with adequate support, and funding be allocated for both needs.

This study's white paper addresses the issue of professional development Learning Logs of the district being studied reflecting teachers' experiences and student implementation of learning into the classroom after teachers are given technology training. The white paper also includes a comparison between qualitative Learning Logs, a Teacher's Attitude and Demographics questionnaire, and an open-ended option Teacher's Perception Questionnaire that reflects what teachers learned after professional development, how teachers implemented the technology into the classroom, and teachers'

experiences with technology. The narrative explorative format allows and creates a justification for a comparison to assess the effectiveness of training. The strategy for data collection was sequential with the professional development occurring first, followed by assessment of the transformation that occurred as a result.

District leaders desired that the problem be identified, so that they could find workable solutions that addressed teacher and student technology needs and could provide funding to support those needs. The white paper (Gordon, 2013b) offers basic solutions to open future collaborative discussions regarding assessing needs through formal needs assessment and follows the cost effective suggestions of educational research, while allowing a medium to encourage additional discussions (Duncan, Cannon, Kitchel & Arnett, 2011; Ertmer, 2005; Project Red, 2010). Identifying the need, offering enough equipment to meet those needs, finding support for problems, and allocating funding to supplement teaching student-based strategies might move the district toward student- directed technology immersion activities (Amzat & Al-Hadhrami, 2011; Baek et al, 2008). Change in the focus of the district toward technology might change the format of the brick and mortal environment while controlling the impact of technology on education (Ally, 2004; Gleick, 2008; Jones, 2009). Teachers and students together could change the environment of today‘s classroom as both learn technology together. Students will be prepared to enter the world of future technology developments as a result of increasing collaborative discussions regarding technology immersion.

Description and Goals of a White paper

This white paper project shows the immersion of technology by teachers after participating in technology-based professional development. The problem identified in

the original proposal was that not enough technology immersion was occurring in classrooms in the district being studied as teachers learned new technology strategies but continued to use traditional teaching strategies (Shapley et al., 2010). The research goal of this study was to explore the degree to which participants were equipped to use technology immersion and integration after attending technology-based professional development. The majority of the participants indicated that the main goal of professional development was to learn to utilize technology platforms for integration into the classroom. The majority of the teachers indicated that technology applications prepared students for the future. The narrative explorative project considered technology and the immersion of technology into education to prepare students for 21st century usage. This exploration of technology immersion was of interest because my research and study showed that students need to be prepared to work proficiently and independently in a technology-based society (Prensky, 2010). Warschauer (2011) reported that technology assessment raised standards especially for low-performing students. Therefore, districts might accommodate in technology. The changes suggested in the white paper not only involve budget allocation discussions, but also technology-based curriculum collaborative discussions that focus on student-directed learning strategies.

Educating school and district administrators, teachers, and community stakeholders about technology immersion might aid administrators in additional options to fund technology to better ensure educators' success in implementing technology immersion practices in instruction (Project Red, 2010). A white paper format allows administrators, teachers, and stakeholders to expand the breadth of knowledge about the challenges and opportunities of technology immersion by providing opinions, input, and

experiences on technology and student-based strategies. The data collection, analysis, and interpretation were based on data taken from five high schools, with four teachers in each high school participating. Comparisons of archived Learning Logs, demographic data, and questionnaires results created a triangulated assessment that was summative in nature showing the amount of technology immersion from the number of teachers who volunteered to participate. The out-come based goal included assessing whether transformation occurred and whether the goal of 21st century preparation for students was met.

Scholarly Rationale of the White Paper

The white paper format is becoming more popular as stakeholders have more information available and less time to decipher the meaning of massive amounts of data. White papers are persuasive essays based on facts and logic from research to promote services and technology (Gordon, 2013b; Madden, 2009). A white paper is neither a brochure nor a long report, but a report that contains an executive summary, is to read, is short in length, is based on well-researched facts, and is used to inform decision makers (Gordon, 2013a). The white paper has become an effective format to inform educational school and district administrators, teachers, and community stakeholders regarding a problem and possible solutions.

Experiences of technology immersion after professional development have led to discussions regarding how to provide better professional development. The suggestions for opening forums for discussions on providing allocations for technology equipment and software and will demonstrate ways to change to more specific teaching strategies (Lawless & Pellegrino, 2007). The economy has become a challenge for all educators as

students and parents demand the latest of technological devices (Hanusehek, Jamison, Jamison, & Woessman, 2008). The costs of technology and technology training continue to spiral, and cost effectiveness and student success must become partner in preparing for the 21st century skill base (Project Red, 2010). The white paper suggests that further technology funding should be part of future discussions.

Implications of the White Paper

The objectives of any white paper is to educate and persuade. The white paper helps stakeholders better understand a problem and its solutions in a format that is easy to read (Madden, 2009). This white paper informs the district of the problem of inadequate technology immersion after providing training through professional development (Shapley et al., 2010). As the use of technology increases, the need for new teaching strategies and better student preparation becomes necessary. The current research study hopes to challenge district officials to become partners with teachers in creating a vision that includes technology immersion and professional development to meet the needs of students. The goal for this white paper is to provide insight into the relationship between professional development, teaching strategies, and the use of technology in the classroom. The white paper information outlines teacher's feelings regarding the use of technology and financial barriers that may prevent teachers using of technology in the future.

Click (2013) suggested that the field of education may require new formats for the basic type of business white paper. White papers outline necessary information and promote change within the system but the field of education has unique characteristics and uses information differently than corporations. Hoffman (2013a) added that the white

paper is an effective way to inform educators on the merits of technology products and services. The white paper is a tool used to increase the understanding of administrators, teachers, and stakeholders about complex technologies involved in financial decisions. This document provide useful information to the reader and provides possible solutions to a problem (Chen et al., 2011). White papers are written to educate decision makers and convince them that solutions are available through collaborative thinking and planning -. This type of report is more likely to be disseminated within the educational system to support and enlist help for new initiatives (Hoffman, 2013a, 2013b, 2013c). A white paper reaches and informs an audience while educating employees and stakeholders. White papers are structured to convince decision-makers that the proposed solution works. The objective of any business or educational system is better achieved via solutions that are based on a facts (MacArthur, 2008). Steinzer (2010) suggested that the white paper is a powerful tool that aids decision makers in justifying discussions regarding the implementation of proposed solutions. Kemp (2005) suggested that using simple terminology in a white paper, increase the likelihood that decision makers will see the need for change.

Review of the Literature

Use of the white paper was appropriate for this study because new frameworks for learning, in response to the connective view of learning, have developed over the past two decades. However, these frameworks still lack specific guidelines for student-directed learning (Gordon, 2013a; Kemp, 2005). Teachers continue to struggle to fuse independent technology-based learning, guided by students, with the traditional method of teacher directed instruction. Teachers are expected to adopt integrated technology in

the classroom as their views change. The combination of constructivist theory and technology produced the most appropriate applications for Internet and computer use, allowing students to be independent learners (Liu, 2011). Integrating theoretical digital designs creates learner-centered classrooms that place the emphasis on learning with understanding, not just knowing (Prensky, 2010). In essence, these theoretical designs are used to improve social and cultural experiences (Siemens, 007). The goal for creating a technology based environment is to improve the world. (Davidson & Goldberg, 2009; Prensky, 2010). This researcher's goal for the white paper included making the learning environment more productive for the 21st century learner; creating this environment will require open dialogue between administrators, teachers, and stakeholders.

Analysis of the Research of a White paper

Research on the use of white papers in education is limited. However, the current research on technology in the classroom demonstrated that changes are occurring; however, changes in education must keep pace with changes in business and society (Salend, 2009; Siemens & Conole, 2011). Using a white paper was appropriate for this problem because it will allow school and district administrators, teachers, and community stakeholders to individually read study results and dialogue about needed change. The white paper is a synopsis of the study, an expository review of the research study (Graham, 2013a). It presented facts geared toward promoting a solution to the challenge of technology immersion (Gordon & Gordon, 2003).

The white paper followed a prescribed format and contained the following components: (1) introduction and identification for the reader of technology immersion; (2) problem statement; (3) background on the research that supported the identification of

the problem' (4) literature review; (5)findings from the exploratory study (6) suggestions for topics of future discussions; (7) time-line to begin open dialogues; and (8) conclusion. The purpose of this white paper was to inform and educate district superintendents, administrators, teachers, and stakeholders on these topics (Gordon, 2013).

Interconnected Analysis of Theory and Research to Support the White paper

White papers address major issues by using data from studies (Graham, 2013b). This white paper addressed teachers' attitudes about technology immersion, a major issue in the school districts in the study. White papers summarizes in-depth information (Graham, 2013a). In particular, the information outlined in this paper is a strong recommendation to school and district administrators, teachers, and community stakeholders to recognize the importance of technology as education and society evolves. It further highlights teachers' need to keep abreast of the latest technology and teachers' struggles to adapt . White papers give recommendations that help create change (Click, 2011). One of the goals for this white paper is for educators to recognize that technology is the way of the future. This paper further outlined suggestions for educators to recognize that Prensky's (2010) "Digital Native" refers to the student of the present day classroom.

Although white papers serve many functions, they address results of a study and give recommendations (Hoffman, 2013a; 2013b; 2013c). The white paper addressed findings regarding inconsistencies in use of technology immersion in an effort to prepare students for the 21st century. Additionally, the content of the project supported the research questions and reflected findings from other educational researchers (Click, 2011). The research data from the current study indicated that strategies did change after

professional development. The foundation of this project included research and theories on professional development, educational student-directed strategies, technology available for the classroom, and the impact of implementing technology in the classroom.

White papers demonstrate how research and theories interconnect to guide teachers adaptation to change and inform decision-makers about the use of resources in an effort to keep pace with educational demands in the 21st century (Ferrier & Garry, 2010; Gardner, 2007; 2013; Project Red, 2010). White papers further help readers visualize the problem and offer possible solutions (Gordon & Gordon, 2003; Graham, 2013). This white paper interconnected theory and research by assessing teacher's needs, professional development, student-directed strategies, and allocating funding.

Assessing needs of teachers. In order to change the learning environment, administrators must conduct a technology needs assessment to find appropriate training and address teachers' needs (Ryan et al., 2011). Administrators must find methods that best support learning (Maskit, 2011). Additionally, technology must meet the new pedagogy of student-directed and guided learning (Renzulli, 2010; Renzulli & Learning, 2011). Technological changes will develop slowly without focused educational strategies defined by teacher's needs. Maskit (2011) found that when school officials addressed teachers' needs they were more likely to make changes in the use of technology immersion. Education is a continually changing entity; therefore, school officials must not allow teachers to only use traditional teaching strategies and ignore the benefits of new technology options for students. This study supports change, but this researcher recognized that full technology immersion has not occurred.

The push toward change comes as a result of unmet teachers' needs (Matzen & Edmunds, 2007; Ottenbreit-Leftwich et al., 2010). November (2010) stated that when teachers needs were met, they were more likely to empower students to use their technological skills. Perkins (2012) emphasized that when teachers' technological needs were met, teachers used better strategies and were able to justify the cost to stakeholders. As a result of the justification, district officials can plan technological professional development around teacher's needs.

Professional development. Teachers must be involved at all levels of professional development to have "buy-in" (Matzen & Edmunds, 2007). The length of training and technology preparedness emerged as significant factors in successful technology immersion outcomes (Kanaya, Light, & Culp, 2005; Guskey, 2000). Teachers successfully made changes when training consisted of multiple sessions and included follow-up (Guskey, 2000). The learner-centered environment available through the use of the internet focused education on active modes of learning with students having greater input on learning. Students have become active learners (Bonk, 2009; NCES, 2010). The white paper allowed school and district administrators, teachers, and community stakeholders the opportunity to consider and openly discuss new options for student-directed learning as decisions are made regarding professional development in the future.

Studies show that change occurred when teachers participated in intensive professional development. These development trainings allowed teachers to form learner communities and helped to maintain the focus on goals for student learning (Bellanca & Brandt, 2010; Bonk, 2009). The professional development experience empowered educators to assist students' success in the digital era (Siemens, 2007). The need for

instructional approaches, which are engaging and active, offers learners greater control, but require more teacher involvement (Bonk, 2009). Understanding the needs of the digital learner is a work in progress and require school districts to provide effective professional development for teachers (Bonk, 2009; Prensky, 2010).

Professional development that included instruction on the use web-based information was more likely to create change (Peter, 2009). Results from the white paper supported web-based information classroom inclusion and the positive impact on students' progress (Brown, 2002). The Internet and web-based information became a medium of change as stakeholders demanded student-directed learning and student success. Both theorists and educators struggled to understand the impact of the new information systems in the world of lifelong learners, but the recognition of student success will continue to drive the demand for new strategies (Koehler & Mishra, 2009). Brown (2002) explained that the dimensions of knowledge accusation are dependent upon the community of practice and the element of change as teachers learn new ways in which students access knowledge. Brown (2002) further stated that the Internet built a fabric that combines the "small efforts of many people with large effort of a few" (p. 15) and introduced teachers to new technology-based practices in the classroom . Tteachers recognized that they must continue to learn through professional development focusing on student-directed strategies (Partnership for 21st Century Skills, 2008) to further student success.

Professional development could be used as a tool for scaffolding students' concrete learning through active learning, higher-order thinking skills, individually tailored feedback, and maximum opportunities for curriculum activity (Bonk, 2009;

Jonassen & Land, 2012). Maskit's (2011) findings showed that teachers should use technology and be conscious of its purpose and effectiveness. Conversely, Bonk (2009) found that training must challenge teachers to remain cognizant that technology increases learning and should be used for more than simply demonstrative purposes. Professional development produces student-directed strategies (Ryan et al., 2011).

Student-directed strategies. Student-directed strategies depend on teachers' ability to use mobile devices to enhance learning. Wong and Looi's (2011) theory of learning, embodied in the mobile student-directed learning, can be incorporated in the classroom as a useful tool for teachers. . Wong and Looi (2011) asserted that mobile devices are like "learning hubs" because they are student-directed activities. Mobile technology linked students inside and outside the classroom, creating a continuous learning medium (Wong & Looi, 2011). Mobile seamless learning, as a result of the use of mobile devices, extended the digital era to encompass formal and informal learning, personalized learning, and social learning. The Internet and affordable mobile devices introduced the digital era to all learners (Schmidt & Cohen, 2013).

The ability to access knowledge anywhere and at any time changed the face of education and digital access (Prensky, 2010). Accessibility to knowledge combined the digital world with physical locations through technology and innovative software (Tamim et al., 2011). Learners are able to access knowledge more efficiently and interact in real time with the environment and people from other cultures (Van Santen et al., 2010). Students can be "present" in the digital and physical environment through mobile IPhone technology (Wong & Looi, 2011). The synchronous and asynchronous use of multiple devices added another element to the educational environment giving students access to

information at any time (November, 2010). The access and synthesis of knowledge through the Internet became a real-time reality that solved educational questions and problems (Wong & Looi, 2011).

The connectiveness and transformational theories guided the development of the white paper and focused on the following obstacles that prevented teachers from immersing technology into the classroom: (a) lack of student input into learning, (b) limited teacher input, (c) inadequate infrastructure, (d) inadequate training, (e) external pressures to conform, (f) personal experiences with technology, and (g) weak technology support work together to become challenges for classroom immersion. The study encountered the following challenges: (a) teachers' lack of time to change curriculum, (b) teacher knowledge of available information technology resources, (c) weak software hardware skills, (d) lack of available computer labs, and (e) lack of technicians to eliminate the frustration in learning new strategies (Agosta et al., 2010). The study also found that teachers were unable to keep pace with changes in technology and were therefore unable to keep pace with new skills (Wong & Looi, 2011).

Allocation of funding. Hanusehek et al., (2008) posited a need for increased funding to support the use of technology-based professional development. Additional funding can also be used to support technological student-directed strategy training, additional technology equipment, and educational programs, which will result in student success (Gray, 2010; Hanusehek et al., 2008).). The implementation of new technology must be cost effective for everyone involved. The biggest challenge concerning cost effectiveness and more efficient education is more revenue to support technology and (Project Red, 2010).

Literature saturation. Literature search and saturation revealed that the focus was on the types of technology versus technology immersion. Additional research dealing with the amount of r technology immersion in the classroom is becoming available. Search terms included technology immersion, digital learning, technology in education, technology theories, and technology barriers. Current studies, published articles, books, and Internet sites produced repetitive information and showed that educational technology-based immersion is facing a transformation to meet 21st century skills as technology use increases (Agosto et al., 2010; Ferriter & Garry, 2010; Warschauer, 2011). The research literature was saturated with information regarding teachers' use of technology, but did not fully support student-directed strategies (Baek et al., 2008; Ferriter & Garry, 2010; Lei, 2009; Levin & Wadmany, 2008). The literature addressed the need for increased use of technology to provide students with a platform to stay abreast of new information (Green, 2007; Hart, 2010; Liu, 2011) and benefit regarding the students' ability to direct their own learning (Bolch, 2010; Burke 2011; Gardner, 2007).

Project Implementation

The white paper will be presented to district officials, school administrators, teachers, and stakeholders. The purpose is to educate and persuade them to engage in further discussion and collaborations regarding technology immersion. School and district officials should begin discussions regarding types of professional development and consider ways to help teachers with technology immersion. Additionally, they must provide equipment and support to fully prepare students for the future. Leaders must

initiate a suitable timetable to implement this project, hopefully resulting in more open dialogue.

Needed Resources, Existing Supports, and Potential Barriers

Resources will be needed to produce and distribute the white paper to the district and local schools. The cost will cover printing and binding the report for presentation purposes. I will ask the superintendent for permission to present the white paper to the School Board, school principals, and teachers. The report will be presented both informally to principals and teachers and formally to the School Board.

Presenting this white paper to the School Board and other officials may be hindered by their perception of the lack of value the information represents. I request that the white paper be made available to stakeholders through the district's website or as a hardcopy to help inform stakeholders of technology immersion. The degree of open communication will serve to determine the level of success of the white paper.

Distribution of the white paper will create a commitment to ongoing dialogues, reflections, and discussions. I am available to discuss results outlined in the white paper with administrators, teachers, and stakeholders as a group or individually to further the immersion of technology. I will continue to be an advocate to encourage ongoing discussion and collaboration regarding technology.

Resources may include funding to provide new ways of data collection, review of teachers' technology professional development needs, funding to develop an electronic system for recording learning logs, and input on modifying existing professional development. Funding may also be a potential barrier to offering professional development in the current calendar year. Lack of funding may cause delays in

implementation during the subsequent school year; moreover, school administrators' priority will determine implementation. Lack of technical support, sufficient equipment, available software, and general frustration with the new technology may present additional barriers. The discussion forums will help stakeholders openly discuss these barriers and actively consider options for solutions. Hopefully, all barriers can be overcome.

Proposal for Implementation and Time Table

Following completion of the university's requirement for this researcher, the white paper will be presented to the district and school administrators. The superintendent and other school board officials will be presented with a copy of the paper to update them on current technology immersion in the five high schools. The hope is that district administrators and principals will consider implementing topics outlined in the white paper and open a dialogue regarding questions related to professional development. Technology immersion and student-directed strategies and support to encourage students and teachers are more beneficial. School personnel and other stakeholders have a unique view of technology immersion. The white paper will be made available to stakeholders through the district website. The goal is that the district, principals, teachers, and stakeholders will consider implementing outlined suggestions and collaborate to make beneficial changes. Educating and providing information to stakeholders to incorporate technology immersion practices in instruction would benefit the schools and the district under study. Educators will have the opportunity to set the direction for professional development and resource allocation. The results outlined in the white paper will strengthen the current research base and support effective learning and technology

immersion. This researcher further recommends that the district continue to explore technology immersion and the implementation of new technology skills in the classroom.

The goals included (1) discussing changes made by schools to assess professional development needs(2) collaboration on immediate changes in the classroom beginning as soon as possible (3) additional training in both traditional and technological environments. (Barbour & Ferdig, 2012). Additional goals include discussing the most effective experiences and teaching strategies and in-services.

Roles, Responsibilities, and Others Involved

Data were collected from teachers from five local High Schools, who voluntarily participated in the study. The principal and assistant principals contributed ideas and aided in encouraging this researcher to continue the project. Students were not involved in the implementation of this white paper. A consultant guided the writing and editing of the final project and the creation of the white paper, but had no access to the raw data. My Walden University doctoral committee chair served as a guide and offered constructive feedback. My role as a practitioner and researcher included gathering the data to create a report that would transform the learning environment in the district.

Project Evaluation

Evaluating this project required understanding the issues that stimulate discussion in a forum that include all stakeholders. The justification for using a white paper centered on the district's lack of immersion technology. This study aimed to bring stakeholders together to openly discuss changes necessary to prepare student for 21st century skills. Outcomes and indicators should be viewed in light of the limited number of participants in the exploratory study. However, it provided an opportunity for open discussions and

possibly created an opportunity to provide more depth in future studies. The overall goal for the white paper was to evaluate the implementation of technology immersion and start a dialogue between administrators and stakeholders. This researcher will measure successful outcomes by the increased collaborations between teachers and dialogue by stakeholders regarding future changes in technology immersion. Additionally, the success of the study hinges on continued dialogue between stakeholders and recognition of the need for continued research with additional participants.

Description of White Paper Evaluation

The white paper might be used as a device to building capacity and encourage discussion about the explorative study with district officials. Outcomes addressed in the white paper provided explicit information to district officials regarding changes that resulted from technology immersion and new teaching strategies following professional development. The overall goal was to provide ideas on topics that would foment dialogue on social change in the high schools within the district. I offered the information in order to create an open dialogue with teachers, using the technological needs assessment. Evaluation of the white paper results will support that an open dialogue has occurred and teachers' technology needs have been more fully met.

The review of the literature outlined in the white paper tied classical research theories to current technological theories in education. The review highlighted changes that occurred in schools and changes that might continue to occur as a result of advances in technology.

The goal of the literature review and resulting white paper was to inform school and district administrators, teachers, and community stakeholders the extent of the

problem of technology immersion and the changes in teaching strategies to meet student 21st century needs in a broader context. The focus of the study was to attain new knowledge and increase the understanding of school and district administrators and stakeholders regarding the need for change (Gordon & Gordon, 2003).

The white paper provided leaders in the school district with information to initiate a conversation about strategies about training for teachers in the 21st century. The white paper was not originally presented to school/district administrators, teachers, or community when initiallycompleted, because it was pending evaluation. This researcher would deem the white paper a success if it produces the type of dialogue that furthers technological and social change in the field of educational.

Overall Goals of White paper

The overall goal was to provide information to support dialogue about technology immersion and how it will transform the way students are taught to access and use information. Results from the current study indicated that teachers believed that technology skills are essential for students; therefore, participating teachers were willing to collaborate with stakeholders and others to make necessary changes. The information in the white paper will assist school and district administrators, teachers, and community stakeholders in the discussion on how to assess the inclusion of technology after professional development. Iincreased discussions by stakeholders resulting from teacher input might lead to changes in the way courses are taught. Furthermore, it will influence student-directed curriculum to include students' needs, and support for open and collaborative format for teachers.

Receptiveness by district leaders, clarity regarding solutions to the current problem, and open dialogue can be considered measures of the white paper's success. Results from the white paper reflected solid and relevant points and presented current evidence and highlighted the importance of the topic (Gordon & Gordon, 2003). School and district administrators, teachers, and community stakeholders should be able to read and understand the white paper's format. The objectivity of the paper, along with adequate support for discussion, will provide a step in furthering technology immersion in the classroom (Hoffman, 2013b). This researcher hopes to disseminate the white paper to decision-makers and other stakeholders who have influence in the educational system (Graham, 2013b). Thus, providing the white paper to decision-makers will promote change (Gordon & Gordon, 2002).

Implications Including Possible Social Change

Implications for this study involved a discussion on access to information and increased student functionality in the world of technology. Technology can open communication, connect the world, and create connections to solve personal, local, and world problems; additionally, it provides a medium of communication medium and changes in education . Immersing technology in education can also create social change through increased collaboration between those who have a vested interest in education.

Local Community

New technology learning mediums open discussion regarding social change when students are allowed input regarding the learning process. Local school and district administrators, teachers, and community stakeholders can use information collected in the white paper to talk about preparing students for the world of advanced technology, a

more efficient educational environments, and technologically sophisticated work environments. Students should be invited to join the discussion about the benefits of technology as it relates to instruction and skills required in their future. Alumni can join the dialogue along with school and district administrators, teachers, and community stakeholders.

The project addressed the needs of individual school and districts administrators, teachers, and community stakeholder to provide quality technology immersed education for students in hopes that students will become productive contributors in the community. The ability to collaborate and use information to help themselves and others is clearly a benefit to independent learners. Providing students and teachers with computers, technology support, Internet connections, curriculum, assessment resources, and professional development will increase the success of student learning throughout the district (Shapley el al., 2010).

Access to technology provides administrators, teachers, stakeholders, and sstudents the opportunity to work in the school, in the district, and the community to enhance student learning. As a result, students will be able to share their experience with stakeholders. Teachers and students can exert influence on administrators, parents, and community leaders to support technology immersion in the classroom. Although the district under study had a technology plan in place, leaders needed to be more engaged in open discussions about putting the plan in place (Bellanca & Brandt, 2010).

Far-Reaching

Preparing students to be useful and productive citizens is one of the goals of the educational system and this project. Connections through technology allows students be

interdependent. Using knowledge to solve local and world problems may be the contribution proficient students bring to the 21st century. Seels and Richey (1994) stated that technology would not decrease; the world would need to embrace it, and bring the world together with common fields of knowledge.

As a result of technology immersion, students may become knowledgeable in many aspects of other societies and contribute in the resolution of social and economic issues as a result of their ability to interact quickly and efficiently with others. Future societies will no longer be isolated; instead there will be increased worldwide interconnectivity. When societies successfully interact to better their circumstances, change occurs. The larger context of bringing the world closer together to share information and solve problems is the ultimate goal for this project.

Conclusion

The white paper gave the district and school administrators information to begin discussion on how to further educational changes and prepare students for a digital environment in the 21st century. Transformation created upheaval in the educational system as changes in traditional teaching methods were replaced by current technology. The white paper opened a forum for discussion and collaboration between those interested in the future of education. Section 4 will include the reflections on the study process and concluded the project study.

Section 4: Reflections and Conclusions

Introduction

I have learned that scholarly writing should be clear and concise and required several rewrites and editing. Writing my thoughts in a logical and coherent manner took time and effort. Reading my original words only conveyed a fraction of my thoughts Becoming familiar with the rules of scholarly writing versus creative writing was challenging. Conforming to these standards required focus and many rewrites. Creating professional scholarly writing accessible to practitioners was an ongoing challenge. I depended on the expertise of committee members to guide me through this process. Although this process was not easy, it was worth the effort.

Project Strengths

The white paper explored results of professional development regarding technology integration and immersion for secondary teachers. Results further highlighted the potential to educate and persuade administrators, teachers, and stakeholders, and to open a dialogue on technology-based professional development. Additionally, the white paper will help to explain the present technology immersion by teachers and students and may prompt discussion on strategies to increase technology immersion among those who read it. Additionally, the white paper explored problems and highlighted issues with technology immersion. Additionally, the white paper provided suggestions for identifying technological professional development by using instruments like Borich Needs Assessment and Delphi technique model to create uniform experiences for teachers (Cannon et al., 2011; Warschauer, 2011) These models have been shown to accurately assess the technology-based professional development needs of secondary

teachers. They also identify and provide a forum for open dialogue among educators. Increased understanding will spur interest in more rigorous research in the future. The project was designed to identify and provide an understanding of the problems that disrupted total technology immersion and transformed teaching strategies. The hope is that administrators, teacher, and stakeholder discussions, along with additional research, will lead to the identification of more disruptions to technology immersion.

Another benefit of using this format is that it created a collaborative environment to discuss professional development to further technology immersion. A professional development focus may better address the needs of teachers and provide relevance regarding the use of technology in instruction. The white paper included additional strengths which included: (1) providing data to open discussions on the lack of coordination in training options, (2) a focus on issues that prevent teachers from using technology, (3) goals, challenges, and needs openly discussed by district and school administrators, (4) a new system that might benefit education as technology changes, (5) additional studies within the district that might further technology immersion, and (6) the increase of student-directed strategies. A final strength is that the white paper suggests topics of discussion to consider technology's overall costs and how those costs can benefit student success.

Project Limitations

Essentially, the white paper was only limited by stakeholders' level of commitment to read and engage in dialogue regarding the topic. Specific limitations included, (1) the exploratory data should have been more concise; (2) the issue should have been presented as a problem statement that was important enough to be dispersed to

district and school administrators; (3) lack of previous studies using Learning Logs; (4) administrator unfamiliarity; (5) the importance doing an exploratory study was not appropriately covered and therefore not taken seriously by administrators; (6) lack of information regarding Learning Logs; and (7) teachers lack of interest in the problem, which may lead to diminished discussion. Change will only occur when educators are open to new data and accept technology and strategies that students need for the 21st century (Davidson & Goldberg, 2009; Liu, 2011)

Remediation of Limitations

Leaders in the educational system and other decision makers might be limited by decreased economic stability, as well as limited funding options as they address topics presented in the project (Project Red, 2010). Education success will improve by providing students with the most recent technology (Hanusehek et al, 2008) and most effective technology instruction (Castells, 2010). The project's success was limited by a lack of adequate hardware and software, as well as technical support.

How to Address the Problem Differently Based on the Study

The white paper outlined the following recommendations; (1) educational leaders and policy makers should weigh the costs of technology immersion; (2) stakeholders must consider barriers that prevent teachers from completely buying into 21st century skills strategies (Project Red, 2010); (3) district leaders should consider technology training as an investment rather than an expense; (4) leaders must tie technology to educational improvement to prevent poor implementation (Shapley et al., 2010); (5) financial results must be tied to academic performance to reduce additional expenses; and (6) leadership efforts must be supported throughout the system to realize the full benefit

of technology in schools. Project Red (2010) reported that 1 in every 1,300 principals has the knowledge and experience to be highly successfully in implementing technology plans. However, school expenditures have increased over the years as the school system faced economy challenges. Disengaged students and low achievement are aspects of costs and are addressed in the white paper. These issues can be buffered through the immersion and integration of technology into the classroom.

Changes in staff development might lead to teachers' growth and excitement about technology immersion, thereby providing a cost savings as professional development increased changes in teaching strategies. There is also a need to create uniform technology-based professional development activities for all teachers so there can be collaboration and shared learning experiences (Warschauer, 2011). Teachers must be satisfied and happy with their own growth and accomplishments. When teachers contribute to the growth of students and the system, as a result of technology professional development, they will become more creative and more readily integrate new technology strategies.

Teachers may benefit by completing Learning Logs at least 3 months after implementing new strategies and participating in professional learning communities to share ideas and assess the effectiveness of the training. Learning Logs can be an effective means of data collection if they are used on-line as part of either a quantitative or qualitative design of data collection after teacher experience technology-based professional development.

A final recommendation involves assessing student strengths and needs, allowing students to have input in their own learning, and making resources available to students

to ensure changes. Renzulli (2010) posited that "you don't produce future scientists and inventors by forcing them to learn in a one-size-fits-all drill and practice curriculum" (p. 14). By engaging students in a 21st century skill-based environment, applying a pedagogy that guides students to individual learning, and creating financially responsible supports, stakeholders and teachers will achieve change.

Analysis of Learning

My learning was personal, and it was a challenge to remain unbiased. Having the ability to look at the process and impact of social change required looking at the choices made in the process of completing the project, and obtaining the best information to show the potential for social change. Becoming a critical thinker required a level of exploratory study analysis that was challenging. Discovering significant errors in my thinking and making appropriate corrections proved as difficult as researching the work of others. What I learned and how I learned it, provided another level of academic growth.

Scholarship

Scholarship is thought to be a process that requires assimilation of multiple sources of information into a format to be shared with others. This project required an inordinate amount of reading, individual class requirements, research on multiple topics, and researching specific information on technology to complete the dissertation and white paper. My scholarship developed as I become more knowledgeable about professional development, technology immersion in the classroom, challenges teachers face, and funding options. The time commitment required of a researcher helped me

develop specific thinking skills to understand the topics. Scholarly thinking helped me remain focused on the field of education and the changes that would benefit learning. I developed more effective skills as I read and analyzed the work of other researchers.

Instructors and peers contributed to my growth as a scholarly thinker by offering direction, support, and feedback. The doctoral committee served as a source of support and confidence building as they critiqued my work and steered me toward the path of scholarly thinking. They were patient when I did not understand scholarly writing instructions and struggled with many rewrites. After working with them, I began to see how they saw a professional statement as opposed to a practitioner's description. I am grateful for the committee's commitment to reading my project and providing guidance. My instructors, doctoral committee, and peers helped me develop into a scholar, researcher, and critical thinker, as I gathered and interpreted data, developed research questions, and wrote in a scholarly voice.

Experts at the Walden Writing Center guided and assisted me with the final product, thereby contributing to scholarship development. The Writing Center provided a safe forum to write my dissertation because it did not have the added pressure of having to achieve good grades. Professionals at the Writing Center focused on my writing, grammar, and mechanical errors, and often served as guides in the use of APA format.

Walden's Research Department support included documents and templates that guided me as my paper slowly became more scholarly. The use of templates created a scholarly format for my dissertation and rubrics guided the content.

Finally, understanding what constitutes a state of scholarship increased my professionalism and helped me focus on the type of work that will contribute to the field

of education and promote change in society. My journey took me on the path of many revisions. Although my writing seemed complete, it was incomplete and confusing to the reader. Each revision moved me closer to becoming a scholarly writer. Revisions brought additional clarity to me and the reader.

Project Development and Evaluation

Determining the best way to organize and present the data to schools, district administrators, teachers, and members of the community became a challenge during development of the project. A white paper was the best format to deliver recommendations, changes, and other information to school and district officials. Topics outlined in the white paper ensured that assimilation of the data reflected the problem and solutions. Each section added to the overall understanding of the problem. Gordon (2012) and Madden (2009) gave guidelines for creating an effective white paper and provided checks and balances to create an clear document that provided usable information.

It was a challenge to decipher the difference between the project and the study. Requirements for the white paper were different than those for the dissertation; for example, information on the white paper was more condensed than the information outlined in the full research project. This condensation required outlining the most germane information; resulting, in the elimination of information that initially seemed important.

Leadership and Change

As a result of writing the white paper and conducting the study, I developed leadership skills. I noticed a subtle change in thinking about scholarship as a result of reading and understanding the subject matter. My desire to influence decision makers and

to improve educational opportunities became stronger with each class and each step toward finishing the process. My goal was to obtain a degree, but developed into a desire to see the educational system embrace technology to improve students' skills. Preparing students for their future in a technology-based society became my ultimate goal. Completing the white paper opened the possibilities of presenting my exploratory findings to professionals.

I found that leadership was not only the ability to bring about change, but was also the ability to listen to others. I also found that I could influence colleagues and peers as the research proceeded. Being a teacher/leader in a school environment gave me a level of humility as the work and efforts of others were fully understood and appreciated. I began to pay more attention to the leadership qualities of administrators and district leaders. I also compared their leadership styles to examples from class readings and the academic literature. I began to observe the actions of leaders in the school in a more professional manner. I examined by own teacher skills and leadership skills more closely. This examination of skills and leadership was an unexpected change.

Analysis of Self

Self-inquiry required an examination of my growth as an educator, as a professional, and as a researcher. My objective was to reflection on my individual mental activity and completion of the project. I also realize how far I must still go to be an effective researcher and writer.

Scholar

Putting aside my personal views and accept input from others was challenging. Bringing clarity to my thinking, at each juncture of this journey, helped create a more

mature learner and scholar. Criticism about my writing from other scholars was not easy to accept during the first few months. I was unable to hear the wisdom in the advice of other. I continually attempted to include in my writing what learned instead of scholarly information and results from the study.

Garnering information from participants was more difficult than I expected. I worked to obtain buy-in from teachers regarding the importance of the research study. Participants, who were unable or unwilling to identify with the problem, were also unwilling to participate in the study. Additionally, I had to develop an overall understanding of the needs of the participants, and the infrastructure challenges that blocked the technology immersion by the teachers.

I learned to manage my schedule to accomplish the research study. For example, I had to learn how to balance my time between family, class requirements, individual class projects, attending doctoral residencies, and overall demands of writing. I also learned to manage my time and developed a sense of professionalisms and pride. Collaborating in a distance learning environment added to my ability to complete many steps in the various assignments. The members of the classes inspired each other to stay on task. Working independently on this qualitative study created a challenge that lasted until the day I finished. I was constantly stressed but had pride in by my ability to complete the project with the higher level of academic requirements.

One of the greatest challenges in completing the study understands the communication system and doctoral process in an online environment. Attending Walden University doctoral residency helped me gain a sense of community with members in the class. Interaction with professors during the residency increased my understanding of the

University's expectations. Interacting with professors and other struggling students helped me understand the research process and theoretical literature. Other students faced similar academic challenges that helped me understand that novice researchers faced common challenges while being a full time employee and researcher. I learned to separate my personal, professional, and research responsibilities, in order to more fully contribute to the field of education in order to influence decision-makers. Being a researcher who also works for the school district required maintaining confidentiality about problems with those involved in the study.

Collecting feed-back from colleagues that resulted in me being self-reflective was often uncomfortable. I had to focus on constructive input and more focused on the purpose of the study. The current research study forced me to be deliberate in seeking information, systematic in data collection, and reflective in the final analysis. Addressing the situation in a non-biased way was also challenging. Achieving a high level of academic focus required limiting personal input. Reflecting on current classroom experiences with an emphasis on transformation changed my views regarding teaching strategies. By focusing on transformation, I was able to view classroom routines through the lens of technology. Teachers and practitioners view the classroom through different lens; practitioners must use a critical eye when addressing real situations.

Practitioner

Teachers such as me will grow when supported by administrators. I found it difficult to keep the research relevant and motivate teachers to participate in the study. As a research practitioner I had to read and understand studies in which researchers asked teachers to volunteer their time and personal records. I used the information to develop

my study and select participants. I learned that I would change the way I conduct future studies to elicit greater participation. I would create a shorter questionnaire and expand the participant pool to include all teachers in the district.

The academic literature increased my understanding of the value research adds to education. I found that the more I read other reports I appreciated them. This experience helped me understand the personal commitment researchers make in contributing new knowledge.

Project Developer

The process of developing the white paper and subsequently finishing the project was overwhelming, but it gave me a sense of pride. There was also a great deal of frustration in trying to ensure the trustworthiness of the project. Developing a project that would create a reflection on social change was challenging.

Becoming a project developer and a scholarly writer required a commitment to learning and growing as a researcher. Finding an appropriate study design required extensive preliminary research. I was unfamiliar with many of the methods; therefore, I reviewed the literature several times to increase my understanding of the format. Producing a product that would be used by decision makers to bring about timely change required collaboration and open communication with administrators. Being a project developer in a functioning educational environment, while remaining objective, was challenging.

I learned that developing a project takes time, research, discussions, consultations, advice, trials and errors, reworking the project, and many hour of reading and analysis of the data. I persevered although I was often confused and frustrated. I also learned that the

outcome is not always what I expected. Soliciting participation was not easy and participants did not always complete the online questionnaire.

Researchers must ensure objectivity by being aware of our bias and keeping them out of academic writing. I fully realize the need to eliminate pre-conceived ideas. As a project developer I hope to provide suggestions that will open discussion regarding technology immersion in the district, access of technology by teachers, focus professional development toward technology immersion and student-directed strategies, and discussions regarding the allocation funding for technology.

My research on white paper allowed me to have the knowledge to write a document that the district and school administrators would accept. I felt school and district administrators, teachers, and community stakeholders would gain usable information to have open discussions regarding technology immersion to further student-directed strategies. The many revisions of the white paper helped me make it more concise so it would convey the information in a clear and focused format.

Reflection of the Work and the Project's Potential Impact on Social Change

A refection of the work showed that didactic instruction alone does not prepare students to use a digital platform in the future. Changes come from: (1) sufficient technology, (2) sufficient Internet connections, (3) consistent access to technology for classroom use, and (4) support from administrators to make significant changes in education. Students now easily use blogs, voice threads, web-based student response systems, and endless new developments of technology to assimilate information and this requires new methods of instruction in the classroom (Richards, 2010). Students now have connections that allow them to access problems both local and international.

Students and teachers working together with access to Internet and media technology-based connections allow input from many perspectives. Project Red (2010) posited nine keys to student technological success that are based on effective communication and cost-effectiveness. This project assessed the benefits of technology immersion, allocation savings, and suggests changes . I anticipate increased collaboration between district officials and stakeholders to make changes. Districts must set examples for other district leaders through their focus on teacher needs, increased technology access and support, and a commitment to preparing students for the 21st century skills required of today's learners.

Implications, Applications, and Directions for Future Research

Increased understanding of the project enabled me to complete the work and increase the possibility of influencing change in the field of education. Easy-to-understand applications allowed decision-makers to more readily accept recommended changes. Future research will be needed to ensure that technology immersion keep pace with technological changes in the world.

The study highlighted the benefit of technology-based professional development, to meet technology immersion demands, for teachers. Many technology initiatives have failed due to lack of equipment or teacher training. These failures will not deter teachers from continuing to plan, build solid technology infrastructure, and schedule professional development to ensure integration of their time and resources. The study was limited by the small number of participants. A larger pool of participants would make future studies more generalizable. The implication is that discussions should include district

administrators, schools administrators, teachers, and community stakeholders to find ways to include technology in the classroom.

The limited number of participating schools and teachers decreased generalizability. A greater number of participating schools and a larger pool of participants might produce better outcomes. Future research should focus on assessing teacher needs, providing training to teach new student-directed strategies, and collect data to review the allocation of funds for technology immersion. Future research would also prove funding for adequate equipment and software, and provide support for technology to ensure changes will quickly occur. These applications will save funding dollars and ensure students are prepared to use technology. Assessing these needs through Learning Logs, collected via a computerized database, allowed results to be easily compiled and used by stakeholders.

The first recommendation on the direction for future research is to make suggestions for discussions regarding opportunities to open discussions on technology needs. The second recommendation is to find ways to improve technology-based professional development. The third recommendation is to increase discussions on ways to expand funding for technology support. The fourth recommendation is that future studies should include a larger sample size through a research method suited to the district. A larger sample size that includes more teachers in the district increases the prospect of generalizability. The fifth recommendation is to address how teachers can change strategies to implement technology at higher levels without abandoning traditional teaching strategies. Without changes in teaching strategies, educational technology might not be effective to meet the students' needs in the future (Bellanca &

Brandt, 2010). Future studies should focus on how technological strategies benefit and/or impacted student learning through a research study designed by the district. District leaders can influence teachers' views regarding the transition from using traditional methods to student-based technology strategies through increased dialogue and collaboration. Future studies should investigate the effectiveness of different venues for presenting technology professional development. Some teachers might benefit from using online sharing designs, while others may benefit from tradition professional development designs. Conversely, some teachers are more receptive to before or after school meeting times (Beetham & Sharp, 2007; Dalziel, 2007). School districts must be in tune and make available the best options for professional development and keep in line with budget constraints (Roschelle et al, 2010).

If teachers do not change to keep pace with technology students will not be prepared to function in a technologically-based work environment. Technology is not going away, but the results of technology immersion in the classroom will require continued assessment regarding the impact on student learning.

Conclusion

Outcomes from this study were presented in the form of a white paper report. Section 4 of the study outlined the strengths, limitations, self-analysis, project development, and project evaluation. The self-analysis reflected a review of what I learned about my own scholarship and leadership as I prepared to become a project developer. The ultimate goal for the study is to prepare students to use technology.

The white paper provided an educational summary of the exploratory research to help district administrators teachers, and community stakeholders make educated

decisions surrounding the impact technology will have on education. Part of the development and project planning meant evaluating the reliability of the project. The white paper informed the school and administrators, teachers and community stakeholders about the state of technology immersion in the classrooms. Collaboration and discussion might aid in improving student learning decision-making to further technology immersion.

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Appendix A: The Project

AN EXPLORATORY STUDY: PATHS FOR MEANINGFUL DIALOGUES

A WHITE PAPER

Peggy Johnson

Walden University

June, 2014

Executive Summary

Introduction

Educational systems are faced with the demands of a technologically changing world.

What is Technology Immersion?

Technology immersion is one-on-one technology for all students using student-directed curriculum that allows students in curriculum to make learning meaningful.

The Problem

The significance of the problem is that the trends toward technology immersion are not occurring in high schools for students on the cutting edge of technology.

An Exploratory Study of Technology Immersion

This white paper focused on the consistency of teachers immersing technology into their classroom instruction after experiencing technology-based professional development.

The Exploratory Findings and Paths to Rich Discussions

Findings of the study showed that changes are occurring, but suggestions are that administrators, teachers and stakeholders have open dialogues on increasing student learning through technology professional development.

Conclusion of Exploratory Technology Immersion

Participant's believed that change is occurring, but dialogues and collaborations on strategies for using technology to improve education are the suggestions of this white paper.

Table of Contents

Introduction

Technology has become a formidable trend and force in today's society. Educational systems are faced with keeping up with the demands of a constantly changing technological world. Technology immersion in Seminole County Public Schools has been progressing at a rate that has not been keep up with the technology students need to be successful in today's world (November, 2011). As a teacher in SCPS, I understand how we work every to prepare our students to be proficient in the skills they need to be proficient. Technology demands that we, as teachers, are skilled and have the latest equipment to teach our students through our training. Technology demands affect professional development, teaching strategies, and allocation of educational funds. Educational systems are forced toward total immersion of technology as students are prepared for the 21st century technology demands (Banister & Fisher, 2011; Downes, 2012).

New technology-based professional development creates opportunities for us as teachers to learn the most recent teaching techniques and strategies so we can implement student-directed learning and technology-based activities to keep pace with the changes. We know that our schools and districts face the demands to increase the use of technology in the classroom by developing and acquiring new equipment, hardware, and software, while providing support for teachers. We work to understand the dilemma as we work in our PLCs and as individual in the classroom. We work to implement student-direct strategies with the technology we have. We understand that students need to have input into directing their own learning. We as teachers strive to give students some

control and ownership to face their technological future where they will be accountable for massive amounts of information in their future.

Change is occurring in education, but total technology immersion continues be sporadically used in the classroom. Several things impact the immersion of technology, such as, adequate professional development, adequate equipment, software for individual student computers, and inadequate technology funding (Ertmer, 2005). Issues in these areas can block the total immersion of technology within the curriculum for the 21st century learner. Districts must ensure adequate facilities, materials, equipment, and funding for staff development to meet the changes education faces today. The district being studied presently is at the recognition stage of the needs of the future and works with teachers. Where the district needs to be is to continue to communicate and work to identify ways to move constantly forward. The district being studied may get there by having open communications and rich discussions that identify needs toward the most cost effective ways to meet equipment and professional development goals to ensure immersion of technology benefits for all teachers and students. Having efficient technological records of professional development also benefits the district to prepare students to be proficient in their digital futures.

Predictions are that by 2019, more than half of all high school courses will be delivered through the online medium (November, 2010). November (2010) questions whether schools are ready for this change. Improving learning is still at the core of all future educational endeavors. This white paper suggests that teachers are ready for changes using the latest technology. Teachers using new technology-based teaching strategies to deal with the information available through the Internet, computers, and

mobile devices will cause changes in the educational systems and society as a whole (Mayes & Freitas, 2010; Wong & Looi, 2011).

What is Technology Immersion?

Technology immersion is having one-on-one technology available for all students while teachers provide student-directed curriculum to allow students to be fully involved in their own learning process. The administrators of the district being studied has moved toward technology immersion as they are providing supportive and focused professional development, student laptops, wireless Internet connections, curricular and assessment resources, and technological and pedagogical support that will lead to a total system support of 21st century skills (Shapley, Sheeham, Maloney, & Caranikas-Walker, 2010). Teachers also report that they still use non-technology-based teaching strategies after participating in technology professional development and fail to contribute the full immersion of the use of technology. The district being studied technology plan showed that administrators do not see the amount of technology in the classroom that they would expect after time and money spent on training (Shapley, Sheeham, Maloney, and Caranikas-Walker (2010) stated that achieving full implementation is challenging because schools selectively used technology, and schools reported having trouble changing instructional practices. This element alone could stand in the way of a school fully using technology with all students with student-directed learning strategies. The white paper reflects some of these same elements as changes are occurring faster than educational facilities can keep pace.

Instructional technology immersion can expand the potential of the 21st century learner when they are surrounded by a collaborative, 24 hour learning period, globally intertwined environment addressing relevant and personal concerns (Lepi, 2012). Students become global consumers of information as they immerse themselves in the endless amount of data available. The technology focus of student immersion should be on the welfare of the people of the world (Siemens, 2009). Students should be taught how to immerse technology to become an asset for all mankind. Technology is an endless field of creations and inventions that students can explore and find connections to themselves and to other people in the world. If individual school does not teach students how to use technology wisely, not only will they not be able to use it effectively to help themselves, they will not have the skills to look beyond themselves to serve society (Lepi, 2012).

Teachers become 21st century facilitators when immerse students in technology and allow them to access data using student-directed strategies that allows collaboration and team work to solve personal, local, state, and global concerns. Teachers understand that students must be immersed in new programs and equipment to create a better learning environment (Shapley et al., 2010). Students have come to expect teachers to keep up with changes in the world and teach using what students have in their daily lives. Technology alone has opened the world to all teachers and learners to be immersed in technology. It has created an environment where the educational facilities are those that must guide students in using information to benefit the future of society (November, 2010). We, as teachers in the classroom, are facilitators and do have students that expect us to keep pace with the most up-to-date technology programs and equipment.

The students of the district being studied and of all districts need to be along beside students having constant access to the Internet through laptops and wireless connections. Those primarily impacted by technology are students as they face a world of the Internet and endless connections. Shapley et. al., (2010) stated that student uses of laptops were the strongest implementation predictor of achievement and technology immersion in all schools. Student achievement, along with involvement in learning, rise as students are allowed to have input into their learning (Siemens & Conole, 2011). Technology has impacted every aspect of student lives. Manual tasks are now done electronically. Complex and critical processes can be carried out with greater efficiency (November, 2010). Student can be quicker and more efficient as they access information and complete assignments while sharing information. How students get to constant connections is through being provided with the proper equipment and adequate programs.

Technology is impacting education and has become the number one trend for all educational endeavors (Lepi, 2012). Lepi (2012) reports that one of the most important ways that technology impacts students is that digital devices save students and teachers time. Lepi also reports that technology impacts students by creating opportunities where they more frequently do their homework. Technology has become a daily part of students' lives to the point that students report using mobile devices at least once every 30-45 minutes , with some now predicting every 5 minutes. Print textbooks are losing their use by students as students now use laptops, EReaders, and IPads.

The ability to quickly access information on-the-go to check facts and review before tests has become a reality for most students. Lepi (2012) further reports that students say it saves them many hours per day of accessing information and completing

assignments. The same students reported they now take online classes to replace traditional class environments. Students now have the option to not only attend a brick and mortar school, but also choose to experience a hybrid type of learning environment (Lepi, 2012). Communication between faculty and students has become more digital as students accept the use of emails, social media sources, blogs, and websites. The delivery system for class announcements and teaching materials are more readily available through these digital sources. As a result of the new trends, the white paper reports that students and teachers in the district are directly impacted by not having sufficient equipment and enough student-directed strategies to positively impact their academic life as they face the world of technological demands of the 21st century. SCPS alone is adding more wireless connections every day in all the schools as teachers are given new ways every week to now connect with students. IPads, IPods, Remind 101, and wireless connections are going in throughout every building at a rapid pace requiring us to constantly adjust our teaching strategies. This is where students need to be in the future, and how they will get there.

The Problem

The significance of the problem is that the trends toward technology immersion are not occurring at a pace to keep 21st century student on the cutting edge of new technology trends (Shapley et al., 2010). The school district leaders reported that technology applications in the classroom are not keeping pace with how students expect to be taught. This is where the district schools are at the moment, and they need to be helping students to keep pace with the predictions while saving the time of students (Lepi, 2012). To better meet classroom and student demands, allocations of funding from

local, state, and federal sources should better work together to prepare students for their technological futures and provide students with only the most efficient experiences in high school (Project Red, 2010).

The school district leaders have the mindset of being dedicated to improving teaching and learning through the use of 21st century tools and strategies. The future of teachers starts now, and the district is focused on teacher preparation. The problem focuses on the process being slower than expected. The commitment, funding, and equipment must be immediately available with adequate training and support. We know as teachers that the district is trying, but it is difficult to play constant catch-up when education has been so far behind what has been occurring in society (Siemens & Conole, 2011).

School administrator and district leaders must be completely committed to student access to technology and a comprehensive approach to teaching strategies and funding (Project Red, 2010). Funding challenges will be faced by educational systems, but these challenges must not stop growth toward increased student success (Allsopp, McHatton, & Farmer, 2010; Davidson & Goldberg, 2009). Without the commitment to further increase student-directed teaching strategies and technology-based sources of information, the district will not meet the needs and demands of the 21st century learner. They will not be able to maximize teaching and learning strategies that empower all students.

The district's vision of transforming teaching and learning through the new methodologies of technology prepares students to be successful in a technologically-based society. The district vision remains flexible toward creating a student-centered learning environment that empowers students. Technological changes will continue as

more technology becomes available and more teachers will embrace and immerse technology into the classroom as student success increases. Teachers are discovering that traditional teaching methods no longer meet the needs of the 21st century student. Teachers are discovering through professional development that they are the key to change in the district. Professional development and technology must grow as teachers grow. Teachers and administrators need ongoing professional development and collaboration with support to understand technology and digital expectations for instructional improvement. The district visualizes designing a future that will pave the way for 21st century learners by providing sufficient training and support for all teachers. The district administrators and all high school principals are working day and night to meet those needs, but still have a gap to fill to full meet the needs of students.

The district developed a self-assessment tool for teachers to guide their own professional technology growth and increase technology immersion. The district's vision supports teachers' continual growth through technology-based professional development. The district leaders support any training need to reach higher stages of technology use. The stated vision by administrators encourages administrators, teachers, and stakeholders to believe that technology infusion benefits academic achievement.

The district administrators further acknowledges that teachers many times lack training, and access to technology that stand in the way of complete immersion. The acquisition of hardware is one the first priorities of this technology plan. The number of computers and peripherals on campuses must increase to provide enough opportunities for all students to reap the benefits of curriculum based technology immersion. School

and district administrators openly support the move to grow technologically and have every school on the cutting edge of the technology trend.

Teacher's sharing ideas, mentoring each other, and collaborating toward total immersion would increase teachers' participation in technology use. The significance of the problem is that the district administrators aggressively seeks to move toward the implementation of 21st century skills for all students, but faces the reality of training, time, equipment, and support for all concerned. Furthermore, administrators face the reality of difficult economic times. The school and district administrators are working to integrate technology successfully and support technology use by teachers for productivity purposes. Schools are beginning to see immersion in the classroom, but still have a gap to fill. The study has shown that more immersion is necessary. Creating additional student-directed learning situations would be one example to further increase technology immersion.

An Exploratory Study of Technology Immersion

The white paper is focused on the consistency of teacher immersion of technology into the classroom resulting from technology-based professional development through an exploratory study. The white paper considers teacher's attitudes toward technology and technology use in the classroom. A reflection of teacher ideas for improvements yields suggestions to improve the future use of technology. Teachers' beliefs and experiences tentatively showed that it impacts them to use technology with their students. The white paper incorporates a qualitative, narrative design to assess the technology immersion of 15 teachers in five high schools after technology based professional development was reported through district Learning Logs. Although teachers received technology-based

professional development training over the past 3 years, there was little evidence of immersion and integration of technology in the classroom after 3 years.

Purpose of White paper

The purpose of the white paper includes an exploration of the relationship between professional development and technology immersion through changed classroom strategies that increased student learning. Responses from two Teacher's Perception Questionnaire and the district Learning Logs gave insight into teachers' attitudes regarding the use of technology through personal experience.

District Learning Logs are carefully collected and tallied after teachers attend professional development as the district's method of following the effectiveness of professional development and to record how teachers are implementing the results of the professional development into the classroom. Learning Logs consist of recordings of topics of discussion with concepts and strategies learned during the training which would have been the primary focus of the session. Teachers are also asked what classroom applications they learn to increase student achievement. The final section of the Learning Log is a reflection, evaluation, and assessment section where teacher record how the training has impacted their classroom environment. The Learning Logs are non-specific in their format to be submitted for professional development point credits. For research purposes, the format with more specific choices in answers would benefit for future analysis.

Educators' Impressions

Table A1 demonstrates the percentages of major responses by teachers. Teachers did not proved personal to any questions on the questionnaire.

Table A1

Responses From Questionnaires and Learning Logs

Responses	%
DEMOGRAPHICS	
Male Participants	27
Female Participants	73
TEACHER PERCEPTIONS	
Teacher have grown as a direct result of professional development	100
1-3 Workshops on Technology linked to school improvement, that increased technology student achievement, and increased cooperative learning using technology and student interactive skills	53
TEACHER RESPONSES	
Teacher feel effective approaches to use technology are when it fits the curriculum as a direct result of professional development	60
Teacher feel they face problems of not enough equipment in the classroom	80
Teacher face difficulty in accessing school computers	67
Teacher face time constraints to plan for technology use	60
Teachers now incorporate technology more frequently	67
Teacher technical and school support increases the use of technology	69
Teacher technology use has increased over the past several years	87
Students are more enthusiastic about learning using technology	87

Note. Percentages do not total 100 because participants endorsed more than one option.

Responses from a Teachers' Attitude and Demographics Questionnaire, as well as answers from open-ended questions from the Teacher's Perception Questionnaire answered questions asking what teachers had learned, how they taught in the classroom, what they needed, what kind of support was provided, and how funding met their needs. Research questions addressed how educators immersed technology into daily activities. Research questions provide a picture of teaching strategies through an exploratory qualitative research design of how teachers' technology-based professional development prepares students for the 21st century technology demands.

Research Questions

The first research question asked in what ways professional development best practices are most frequently used in the classroom because of the participants attending technology-based professional development. The Teachers' Attitude and Demographics Questionnaire data showed that participants "increased the use of technology after attending professional development. " The two questionnaire results showed that 60% of teachers "now use technology. "Additionally, 60% of participants perceived that "their strategies have changed due to the use of technology."

The Learning Logs were not specific enough to give data for this specific question but teachers did say they were "taking new ideas back to the classroom. "Participants reported what strategies they used due to the professional development, but did not indicate to the extent they increased their usage. The Learning Log format did not allow for teachers to choose categories for the amount of use and the changes over time. The abstract format of the Learning Logs did not allow for rich data to be obtained.

The second research question asked how potential participant's perceived current technology-based professional development they received and the impact on the use of technology-based teaching strategies. The Teachers' Attitude and Demographics Questionnaire teacher response results revealed that technology-based professional development was highly effective in changing teaching strategies. The Teacher's Perception Questionnaire results showed that participants selected all 8 of the strategies. Fifty-three percent of participants reported they used 2 of the 8 strategies, "cooperative learning and student interactive strategies," 40% used "individual strategies," 47% used "teacher directed strategies," and 40% used "student directed strategies." Thirty-three

percent used “student-led group activities,” while 20% reported they used “other strategies.” The Learning Logs reflected attendance and themes of the activities and concepts and strategies learned, but fail to provide information about implementation over time. The themes reflected: 1.) students better analyze their own work, 2.) teachers analyze data, 3.) teachers face obstacles, and 4.) teachers promote achievement. The Learning Logs did not provide adequate information to be fully useful for data collection purposes.

The third research question asked how potential participants perceived the professional development provided by the district with emphasis on 21st century learning. The Teachers’ Attitude and Demographics Questionnaire teacher responses showed that “student-directed technology better prepared students for the 21st century.” The Teacher’s Attitude and Demographics Questionnaire teacher response results also showed that 25% of participants perceived “technology application better prepared students for the future.” The Teachers’ Questionnaire indicated that 47% of the participants perceived the “district as offering opportunities for increased technology knowledge” while 80% stated the district “encouraged the use of technology.” The results indicated that 7% of participants perceived the “district continually asked what was needed by teachers.” While 13% of participants perceived that the “district did not support the use of technology”, the results were a small percentage. The Learning Logs did not address 21st century learning and none of the participants added additional information.

The fourth research question asked how technology-based professional development experiences affected student-directed technology strategies in the

classroom. Six of the 12 questions on the Teachers' Attitude and Demographics Questionnaire addressed student-directed strategies. The responses indicated that teaching strategies changed in a "positive manner." The Learning Logs indicated that 100% of participants perceived "professional development activities increased student-directed activities because of the training they attended." There were no indications to the amount of increase or an indication as to the type of student-directed activities. The format of the Learning Logs did not elicit such specific responses.

The Teacher's Perception Questionnaire results showed an "increase in student-directed strategies in the classroom." Fifty-three percent of participants perceived an "increase in cooperative learning," 47% of participants perceived an "increase in student interactive strategies," and 33% perceived an "increase in student led group projects." The data showed that 40% of participants perceived that "student-directed technology-based activities increased," while 60% of participants also showed that they now make "technology a daily inclusion in their teaching strategies."

In the Teacher's Perception Questionnaire, 67% of participants indicated that "students benefit from student-directed technology assignments." No participants perceived that "teachers should direct all the activities in the classroom." Learning Logs indicated that 60% of participants "utilize technology platforms." The Learning Logs again indicated that 100% of participants perceived professional development activities "increased student-directed activities because of the training they attended." The Learning Log format did not provide specific data information to correlate the activities to the specific professional development.

Additionally, the Learning Logs and questionnaire asked how student success rates changed as a result of immersing technology-based strategies. The Teachers' Attitude and Demographics Questionnaire indicated that participants perceived "student success increased as a result of immersing technology-based strategies in the classroom." The Teacher's Perception Questionnaire responses indicated 47% of participants perceived an "increase in student success due to technology immersion in the classroom." Fifty percent of participants perceived that "student grades improved due to technology-based strategies" and "clearly improved success." No participants perceived that "student success decreased" as a result of technology-based activities. Additionally, participants noticed a "positive change in success." The results showed that all participants perceived some sort of "increase in student learning." The Learning Logs indicated that 27% of participants perceived that technology promotes "positive" achievement. Teachers reports that technology "increases student achievement and student success. "Due to the format of the Learning Logs, being specific regarding the amount of achievement and success was unclear.

The project indicated that "student-directed activity curriculum changes prepare students better by teaching them to have input into their ideal learning situation." Teachers have become learners along with student because "students now have such a wide variety of information sources available thanks to the Internet and mobile devices." This change is "intellectually stimulating for both students and teachers" and allows both to grow and explore 21st century concepts and skills. It is imperative that future discussion regarding allocations of funding support the growth of students and teachers through technology. Supporting changes in teaching strategies through questions that

create discussions listening to teacher needs and providing them support in their process of making changes will make a difference. Student achievement may increase through the use of technology in the classroom when implemented and immersed to a maximum level (Siemens & Conole, 2011).

The Exploratory Findings

This study explored the participants' use of technology in the classroom after professional development and how the participants implemented new skills into instruction. The research design gave beneficial results and aided in possibly improving professional development offerings. The white paper provides a more accurate picture of increased learning and transformation. s in the classroom while using technology based on the questionnaire and the Learning Logs results. The results of increased learning can potentially save money for the district, but must be timely in the opportunities provided to teachers and students. The white paper's participants had an average of 10 years teaching experience and had at least three technology-based professional developments.

Teachers (73%) reported that the training on student-directed strategies helped them positively impact student learning. Teachers reported using student focused cooperative learning activities, group projects, research projects, connections with other schools, and increased writing skills all due to the ability to use technology. Teachers reported that they use technology as a daily part of their teaching in some way or another. Some teachers were unsure if their strategies had changed, but they did use some technology in the classroom. They also reported through data that they see positive changes in student learning as a result of technology. The results from teachers support that technology use has increased in the district. The majority of the data was obtained

from the two questionnaires, but the Learning Logs provided the narrative data regarding the types of technology-based professional development teachers attended. The long term impact of immersion into the class environment was unclear as the date of completion for the Learning Logs was unclear.

Table A2

Change in Teaching Strategy

Responses	%
I have changed my teaching strategies	60
My teaching strategies have not changed	20
My teaching strategies will change in the future	40
I am not sure if my strategies have changed	7
I am not sure if strategies need to change	0
Additional comments	7

Note. Percentages do not total 100 because participants endorsed more than one option.

The changes in teaching strategies were noteworthy. Even with the small number of participants in the study, those volunteering their time to participate in the study show that progress are being made in the district. Sixty-seven percent stated that professional development gave them "options for using professional development in the classroom and gave them information to make changes in the classroom." Teachers are attempting changes, but have not "fully immersed technology into their classrooms." The teachers did not indicate this change in their narrative reporting on the Teacher Perception Questionnaire.

The obstacles to technology immersion included "not having enough equipment, not having enough time to work for planning how to use new programs and equipment, a concern that technology be mandatory due to availability to students of lesser means, and lack of technological and peer support when using new equipment." Teachers perceived

the district "encouraged them to use technology," thus technology has become an essential element in teaching. "All teachers indicated that they "perceived more funding was necessary to fully meet the changes for the future." These consistent results through all five schools show some consistency through the district. The Learning Logs did not provide enough narrative details to give clear results of the amount of funding and the type of support needed by teachers. A more specific Learning Log may provide more usable data. Table A3 demonstrates teachers' support of 21st century skills.

Table A3

District's 21st Century Technology Support Through Professional Development.

Responses	%
By offering opportunities for technology use	47
By encouraging the use of technology	80
By constantly asking what is needed by teachers	7
Is not supported at all	13
Other.	13

Note. Percentages do not total 100 because participants endorsed more than one option.

The increased opportunities for professional development in all schools have had an effect on all teachers. The majority of teachers reported that professional development had a direct impact on how they "presented information using technology" in the classroom. The district encourages the use of technology and 80% of teachers report using technology. The Learning Logs did not indicate this element. Exhibit D demonstrates the responses of teachers regarding the results of attending professional development. Professional development is seen as a positive experience to support technology.

Table A4

Teachers Completing Professional Development Programs

Responses	%
Showing me how to use technology	67
Giving new ideas for daily activities	67
Increases my confidence using technology	53
Do not give me enough information	20
Other personal technology needs	0

Note. Percentages do not total 100 because participants endorsed more than one option.

The questionnaires results showed that without professional development, teachers would not be exposed to the latest in technology use or the latest programs for student access. The use of electronic equipment such as writing tablets, social media sharing, Blackboard usage, electronic pens, Internet interface programs, test creators, student assess software, and the teacher website all "contribute to a new way of teaching and to increased input by students into their learning. "Eighty percent of participants further reported that they "did not have enough equipment and software to have each individual student fully connected," nor did they "have enough time to plan for technology use." Regardless, almost 70% of teachers now use technology in the classroom. Participants reported frequently using technology, but felt they could "use it even more in the future." The Learning Logs did not address these topics.

Teachers reported that they regularly participate in technology-based professional development that provides them with the "skill sets they need to incorporate technology into the classroom." Seventy-three percent of the teachers indicated that "technology-based professional developments" are linked to "overall school improvement and student achievement." Teachers further indicated that the strategies that are learned in the professional development trainings are "easily adapted to the classroom." Sixty percent

of participants indicated that the classroom application of "technology strategies have changed in the classroom as a direct result of technology-based professional development. " The Learning Logs did not provide data for these questions.

Of the participants 80% perceived the "district encourages the use of technology," while 93% indicated that technology skills are "essential for all students, and students seem to be more enthusiastic about learning when using technology." The common theme among the teachers was there must be "sufficient programs and computers available to fully immerse technology into the classroom."

Teachers also indicated that "administrators and technological support" are both important elements as the use of technology increases in the schools. Teachers felt "administrators encouraged the use of computers and try to support them in all technology use." Technology has become a common function in the educational setting and will remain a core part of the learning process. Technology opportunities increase each year and administrators and stakeholders will remain under the pressure to respond to the needs of students as they demand technology. The questionnaires and Learning Logs reflected through the narrative dialogues that the district and the schools are supporting the teachers as much as possible with equipment and training. Exhibits E and F indicate how important support is to teachers.

Table A5

Participants' Reflection of Consistent Technology Use Due to Support

Responses	%
It creates additional stress and frustration	60
It makes me feel I can overcome frustrations	33
It does not affect me at all	13
It is not useful at all	0
Other personal experiences	20

Note. Percentages do not total 100 because participants endorsed more than one option.

Table A6

Participants' Use of Technology After Support

Responses	%
It creates additional stress and frustrations	20
It makes me feel as if I can overcome frustrations	47
It does not affect me at all	27
It is not useful at all	13
Other	7

Note. Percentages do not total 100 because participants endorsed more than one option.

There is a great drop in the addition of stress and frustration with the addition of support and the use of technology. The 40% drop in the stress and frustration indicates that teachers would be more inclined to use technology more often. To provide training on technology and technology applications when teachers do not have access to appropriate help using hardware and software hinders them from immersing changes in teaching strategies. It often impacts teachers' attitudes toward making the changes toward 21st century technology skills.

Having professional development at a convenient time when support will be available to then help teachers apply it to the classroom will create the "maximum of use in the classroom." Teachers feel they can "overcome their frustrations when someone is

there to answer their questions and help with new hardware and software." Teachers stated, "We, as teachers, know that school and the district administrators are working to provide what we need to meet students' needs," but open discussion on how to now provide teachers needed support would make the path smoother for teachers to feel less frustrated when programs and equipment do not function to meet expectations.

Paths to Rich Dialogues

The suggestions focus on district and school administrators creating opportunities for educational forums for rich dialogues on increasing student learning through technology based professional development, increasing student-directed learning, and prioritizing funding of technology trends. Discussing methods to obtain Learning Logs from teachers would through new technology based formats would allow teachers to return to the classroom and reflect the changes over time and might more accurately reflect the impact of technology immersion on student-directed learning. The overall educational discussion goals are to move to meeting the goals of the new digital student and his/her preparation to function in a world based platform.

These suggestions are a result of this white paper are meant to create questions and collaborative discussion between administrators, teachers, and stakeholders to aid the students of this district toward moving to the future. Because this study was exploratory and did not successfully collect enough data to fully support the findings in a quantitative or a full, rich narrative qualitative manner, recommendations would not be in order. The impressions obtained from the study required a larger number of participants to definitively come to a conclusion and concrete recommendations. Suggestions are to begin rich discussions.

The exploratory study did allow for the administrators, principals, teachers, and stakeholder to consider a number of questions raised by teachers concerning technology immersion, professional development, student-directed teaching strategies, and technology equipment and access in the classroom. Collectively teachers have presented a number of topics to give a deeper understanding of the problems that can open rich dialogues for the future.

The study showed that because teachers did not voluntarily add additional comments to one of the questionnaires, additional opportunities for teachers and administrators to provide input on these topics would be beneficial. Additional dialogue to openly discuss these topics would provide rich input to proceed and possibly create actions from the suggestions for discussions of this study.

The white paper is a mechanism to elicit input from all concerned with professional input to address technology immersion and student-directed strategies preparing students for the future. Collectively coming together in preparations for the 21st century skill levels are needed for students to be successful beyond secondary education opportunities and function successfully in a world of global digital connections.

Suggestions for Prioritization:

The suggestions are based on the following changes in discussions and communications between administrators, teachers, and stakeholders to possibly be implemented in the order they are listed. Discussion to assess the needs of teachers is the most important item when assessing how technology can most effectively be immersed into the classroom. Professional development that meets the academic needs teachers must have to prepare

their students is paramount to insure success for students of the future. Only teachers' input can define these needs.

Readiness Dialogues for Assessment of Teachers:

Discuss the needs for technology-based professional development of teachers:

- ☐ Involve teachers in focus groups for professional development needs.
- ☐ Open discussions on the needs of teachers regarding barriers to immersion of technology in their classrooms. What are the present barriers?
- ☐ Discuss with teaches their needs for technological support. What are needs today?
- ☐ What are teacher suggestions for additional equipment and software?
- ☐ Discussions with administrators, teachers, and stakeholders to identify technology-based professional development delivery systems to ensure the delivery of training in the most cost-effective way. Does online delivery work for teachers?
- ☐ Open forums on ways the district Learning Logs could be completed in an online method that records the impact of technology strategies implemented into the classroom. What are ideas to change collection methods?

Considering Professional Development in Discussions:

- ☐ Discussions regarding Learning Logs completed in a digital quantitative and qualitative design format at least three months after professional development and PLCs to assess the impact of professional development on student learning.
- ☐ Forums to discuss providing professional development to prepare teachers for student-directed classroom environments using technology integration.
- ☐ Discussions on how to increase Internet based technology and software training.
- ☐ Forums on professional development helping teachers create and teach technology based lessons to fully utilize and connect students to their individual learning.
- ☐ Teachers groups forums on periodically attend mandatory technology-based professional development peer support using technology and.
- ☐ Educators discuss through professional learning communities recent research that investigates the impact of technology on student learning.
- ☐ Professional development can be considered successful when teachers increase student use of technology using student directed strategies.
- ☐ Professional development can be considered successful when teachers increase student use of technology using student directed strategies.
- ☐ Professional development will engage teachers in designing lessons using technology on a daily basis. What are creative ways to engage students using technology?

Student-Directed Teaching Strategies for Future Topics:

- ☐ Forums to discuss way provide teaching strategies to address needs of students through student-directed learning in professional development.
- ☐ Discussions on trainings on student-directed learning and teaching strategies focused on student needs and on the implementation of technology.
- ☐ Forums and collaborative discussions on how to use technology to create student-centered curriculum where lessons are authentic, multidisciplinary, and directly related to standards and student outcomes.
- ☐ Discussions on how to implement lessons in which students collaborate and integrate student technology standards into curriculum-based projects.

Questions on Options for Future Technology Funding:

- ☐ Forums and discussions on funding allocations to provide individual computers and adequate software for all students. How can it creatively be done?
- ☐ Discussion on how to find funding to purchase additional equipment such as an Elmo, video cameras, on-line testing programs, interactive communication programs, blogs, websites, and Quizdoms for test assessment to benefit learning.
- ☐ Forums on how to fund hardware and computers to provide opportunities for all students to reap the benefits of student-directed technology strategies.
- ☐ Discussions having more direct contact with parents through websites and emails to decrease communications and postage costs and earmark toward technology.

- ☐ Administrative, teachers, and stakeholder discussions and how to most effectively use the existing technology without additional expenditures.
- ☐ Open discussions on how to provide for an electronic system to collect and track the Learning Log data results. Is this even feasible or needed?
- ☐ Open forums on ways to access additional funding through grants and federal funding. What is available through state and federal systems?

Dialogue TimeLine:

The time line for dialogue and discussions will be individualized by administrators and schools. It would be optimal that discussion begins as soon as possible. Having teacher input through PLCs on professionall development might begin to open the input from teachers for training on focused on student-directed strategies using technology as soon as possible. The questions and discussions to create a technological system to collect the Learning Logs would move collection toward a more systematic method perhaps in a timelier manner. At the same time, the school district and school administrators could elicit questions from stakeholders on possibilities for funding increasing the amount of technology and technology support available to teachers and students. I would be willing to act as a source for bringing questions before administrators, teachers, or stakeholders if I was contacted by those reading this report. A step toward discussion to immediately address corrections in response to new trainings and integration of technology into the school curriculum could positively affect student achievement.

Conclusions of Exploratory Technology Immersion

The exploratory white paper suggests that participants believe that change is occurring. Teachers indicated that technology does improve learning and student interest. District and school administrators might deeply discuss what works for meeting teachers' needs and provide training that will ensure the greatest success. The district must not be left behind in preparing students for their technological futures, thus open discussions with all stakeholders will keep all options on the open. Immediately beginning to assess the needs of technology-based professional development and having discussions on timely changes will benefit teachers and students.

This white paper gives results and suggestions that could beneficially improve discussions regarding professional development, teaching strategies, and increased equipment availability. Continued exploration of technology across the district schools would give a broader view of technology immersion by teachers. Further dialogue on immersion of technology into the curriculum with the equipment to support that curriculum could possibly be the next step administrators could considers. Dialogue on allocation of technology funding could result in more student-directed strategies throughout the curriculum that fully immerse technology and prepare students for their future in a connected world. Integrating technological strategies in the curriculum discussions might result in better student performance and increased learning for the student of the future. A consideration and input into possibly a more efficient system of recording Learning Log results might benefit technological professional development planning in the future.

Discussion on district curriculum might include using technology strategies to allow students to successfully compete in the 21st century global economy. The district and school administrators might additionally continue discuss providing teachers with equipment and support to help students be successful. The district social, economic, geographic, and demographic factors might be taken into consideration as these plans are considered. .Partnerships in discussions with the community, business, and industry might be a component to ensure school and district administrators, teachers, and community stakeholders that support the 21st century learner.

The white paper suggests that genre is a mechanism to give district administrators, principals, teachers, and stakeholders the opportunity to freely dialogue and openly discuss and communicate. The white paper may also be a means to allow additional input and comments from more professionals in the schools and within the district that have input regarding technology immersion. The study was small in the number participants and additional input could add more depth to strengthen the findings from additional teachers and administrators. This white paper could possibly lead to the support of a larger study by the district to include all schools and teachers. A fully developed study of this 21st century district would reflect students that are technologically centered in a digital environment taking ownership of their own learning.

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Appendix B: Letter of Cooperation from ------ Public Schools

Dear -----,

Based on my review of your research proposal, I give permission for you to conduct the study entitled *Technology Strategies in the Classroom after Completing Professional Development* in cooperation only with ABC High Schools.

As part of this study, I authorize you to ask principals to ask teachers to participate in the study. Individuals' participation will be voluntary and at their own discretion. A copy of individual teacher learning logs will be provided along with personal emails in order to contact individual teachers for survey purposes. SCPS email systems will not be employed.

We understand that our organization's responsibilities include: assisting in contacting teachers and assisting them in providing the requested information to the researcher. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting. I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the research team without permission from the Walden University IRB.

Sincerely, -------

Deputy Superintendent, Instruction

----- Public Schools, Electronic signature:

Appendix C: Principal Letter

Technology Strategies in the Classroom after Completing Professional Development

Dear Mr.

Principal ABC High School

RE : Participation in Doctoral Research Study – --- University

I am contacting you to ask permission to have ABC High School to be a source for data collection to complete my doctorate research for---- University. I will also be asking the principals at ABC High Schools for permission. This research will require four teachers to participate from each of the five high school core departments (English, Math, Science and Social Studies). I must begin with your permission to contact four teachers and ask to use their learning logs. They must have attended technology-based professional development and complete Professional Development Learning Logs and be randomly selected from the core departments.

I will be collecting research data on technology immersion in the classroom after professional development. The reflective portion of the Professional Development Learning Logs will be coded to protect teachers. These teachers will be asked to complete a survey that further looks at technology immersion and instructional strategy changes. The objective is to gain insight in strategy and assess how education can better serve teachers through professional development.

With your permission, I will contact teachers for written permission to use his/her learning log for research purposes and participate in the online survey. I will obtain the learning logs through your office after teacher initial permission is granted. The learning logs will have all names immediately removed and coded so all identifying information is protected. Confidentiality will be protected at all times.

The teacher will be forwarded a link to the Data Use Agreement Form, Confidentiality Form, and Consent Agreement Form to be signed to participate in the 15-30 minute survey for data collection.

Thank you for your consideration and help.

Sincerely,

-- Doctoral Candidate

Appendix D: Participation Consent Form

You are invited to voluntarily take part in a study on the impact of technology-based professional development and technology immersion in high school. You were chosen for the study because you are an educator at in ------- Public Schools and attended technology-based professional development. You also completed a personal district Learning Log. Please read this form. Feel free to ask any questions before you agree to voluntarily be a part of this study. The data set will be personal Learning Log and Survey Monkey data collection. You will be giving your consent to use your personal Learning Log for data analysis and asked to complete an online questionnaire.

This archival data and two questionnaire study is being conducted by P. Johnson, who is a doctoral student at-----. Mrs. Johnson is employed by -----. Ms. Johnson does not hold any position of authority in the district.

Background and Procedures:

The purpose of this voluntary study is to assess the impact of technology professional development on changes in technology immersion and teaching strategies. This study will involve data collection from individual Professional Development Learning Logs. I requested volunteer participants to allow me to review personal learning log for research purposes. All names and ID information on Learning Logs will be numeric and alpha coded by the research to retain confidentiality.

The study will also include individual completion of a Survey Monkey online questionnaire. The questionnaire will take approximately 15-30 minutes to complete. The questions will reflect teacher strategies, attitudes, and technology immersion. This information will be compared with other participants in the study to assess if change occurs due to technology immersion over time.

Voluntary Nature of the Study:

Data usage from the Learning Logs and participation in this Survey Monkey questionnaire study is strictly voluntary in nature. This means that your decision on whether to participate or not will be strictly confidential. No one at ------- will have access to your decision to participate, nor treat you differently if you decide not to participate. If you decide to join the study now, you are still free to change your mind later. You may drop out at any time. Your confidentiality will be protected at all times.

There will be no risks for participation in this study. Assessing the level of technology integration will benefit schools by providing data on the effectiveness of technology professional development and successful student learning. Twenty-first century society will benefit when students are technologically centered in a digital environment.

Compensation and Costs:

This study will not include any compensation for participation. All participation is voluntary in nature. There will be no additional costs to the participants.

Confidentiality:

Any information provided by for the purposes of this study will be kept confidential. The research or university will not use your name or information for any purposes not directly related to this research project. Your name or any identifying information will be coded in any written reports of this research project. All participant legal rights will be safe guarded.

Contacts and Questions:

The researcher's name is -----. The researcher's faculty chair is ----. If you have questions, you may contact the researcher via telephone at ---- (cell), or email at -------. The adviser may be contacted via email at -------. If you wish to talk privately about your rights as a participant, you may contact the -----. The IRB will contact you immediately. ----- approval number for this study is ------ and it expires on -------**.**

If you agree to participate in this study, please reply to this email with the words "I Consent. " A link to the questionnaire will be given to you after your consent has been received. Please retain a copy for your records.

Appendix E: Teacher's Attitudes and Demographics Questionnaire

Please share your opinions regarding technology-based professional development. Choose the answer on the questionnaire after each question that most closely aligns with your response. Please complete the demographic questions.

Technology and Professional Development	Highly Agree (1)	Agree (2)	Does Not Apply (3)	Disagree (4)	Highly Disagree (5)
Technology-based professional development is highly effective in changing teaching strategies					
There is a positive relationship between technology use in the classroom and technology-based professional development experiences					
Student-directed technology-based learning has increased the success of my students					
I have increased the use of technology with students as a result of professional development					
Technology applications seem more user friendly after professional development workshops					
As a result of professional development focused on technology, I use more student-directed learning methods					
Student–directed technology inquiry methods will better prepare students for the 21st century					
My assessment methods have changed to include more technology-based assessments					
My students are more successful on assessment as a result of using technology					
Technology makes teaching more effective and improves student success					
Increased classroom application of technology student-directed strategies increase student success					
Technology application better prepares students for the future					

Teacher's Attitudes and Demographics Questionnaire

Demographic Information: Please choose all/one that most closely describe(s) you.

1. My gender is:

    a. Male
    b. Female

2. My age is:_____ years old

3. My years of teaching experience are:_____ years

4. The core course I teach is:

    a. Math
    b. Science
    c. English
    d. Social Studies
    e. Other

5. I completed at least one technology-based professional development learning log:

    a. 2-4 weeks ago
    b. 4-12 weeks ago
    c. 3-6 months ago
    d. 7-12 months ago
    e. 12-24 months ago
    f. Over 24 months ago

Appendix F: Teacher's Perception Questionnaire

The following questions will help assess the experiences and changes due to technology-based technological professional development.

Please bubble an answer that most closely reflects your present teaching situation.

If one of the multiple choice answers does not fully describe your experience, an additional comment box has been provided for you to give a more accurate description.

6. My teaching background includes technical education training. Choose as many as apply and feel free to add additional comments to fully share your experiences.
    a. No formal training using technology
    b. 1-3 workshops/classes of technology training
    c. 4-10 workshops/classes of technology training
    d. More than 10 workshops/classes of technology training
    e. Personal or University training only
    f. My personal experiences with technical education training not included in the choices

    _____
    _____
    _____

7. What are professional development programs that taught you how to integrate technology into your classroom? Choose as many answers that apply. Please provide any additional information that describes your teaching experiences.
    a. None
    b. Workshops alone
    c. Workshops followed by technical support
    d. Support and interaction from other teachers
    e. My personal experiences with PD and technology and not part of the choices

    _____
    _____
    _____

8. My professional development experiences include which of the following characteristics? Choose as many answers that apply. There is a comment box to add additional information.
    a. Workshops linked to overall school improvement and increased student achievement
    b. Meets the needs in my content area
    c. Was a positive experience
    d. Strategies easily adapted to classroom
    e. Provides practical instructional technology student-directed strategies
    f. Connects new concepts to prior knowledge
    g. Is important effective use of my time
    h. Make long lasting changes in my teaching
    i. Helps me impact student learning in a positive way
    j. Projected knowledge and skill focus was clear
    k. Other characteristics of technology professional development that I have attended

    _____
    _____
    _____

9. Teaching strategies from technology-based professional development have changed to include many types of teaching strategies. Please choose all that apply and add comments.
    a. Individual strategies to help students
    b. Group activities led by students
    c. Student-directed strategies
    d. Teacher-directed strategies
    e. Cooperative learning, student focused strategies
    f. Student interactive strategies using technology
    g. Student-directed technology-based activities
    h. Other technology-based strategies I have learned.

    _____
    _____
    _____

10. Please identify any problems that impact the use of technology in the classroom. Choose all that apply and feel free to add comments.
    a. Not enough equipment
    b. Computer difficult to access
    c. Programs too difficult to use
    d. Not enough time to plan use in the classroom
    e. Inadequate training
    f. Inadequate support when problems occur
    g. Technology has not been an issue
    h. My personal experiences with problems with technology use in the classroom not included in the choices

    _____
    _____
    _____

11. What is an effective approach to using technology strategies in the classroom? Please feel free to add additional comments or opinions that apply to your personal teaching and professional development situation.
    a. Use only when have time
    b. Use when fits the subject matter
    c. Make it a daily part of teaching strategies
    d. Only allow students to use at home
    e. My personal experiences with effective technology strategies not in the choices

    _____
    _____
    _____

12. Student success has changed in a positive or negative way due to the use of technology. Choose all that apply. Please provide any additional information you feel would reflect your teaching experiences.
    a. Somewhat.
    b. A measurable improvement in scores
    c. Has resulted in lower measurable scores
    d. Clearly improved success
    e. None at all
    f. Student class grades have improved
    g. Has resulted in lower standardized scores
    h. Unable to measure effect
    i. Have not noticed a change
    j. My personal experiences with student success and technology not part of the choices

    _____
    _____
    _____

13. Classroom application of technology strategies have changed in my classroom as a result of technology-based professional development. Choose all that apply. Please feel free to add additional comments or opinions that apply to your personal teaching and professional development situation.
    a. Very little
    b. As a direct result of professional development
    c. Have had no impact on my teaching
    d. Has decreased because technology not worth the time
    e. The professional development does not help me use technology
    f. My personal experiences using technology strategies that are not part of the choices

    _____
    _____
    _____

14. I have grown in my use of technology in several ways. Choose all that apply. Please feel free to add any additional information that might show your personal experiences.
    a. Emails to students and parents
    b. Electronic gradebook use
    c. LCD projector
    d. Video sharing to enhance lessons
    e. Electronic writing tablets
    f. Social media sharing such as Facebook
    g. Blackboard assignments and discussions
    h. Electronic pens
    i. Skype and other interface programs
    j. Quizdoms and other electronic testing technology
    k. Teacher generated class website for student use
    l. Student computer use to teach student-directed lessons on a consistent basis
    m. Very seldom use technology except for record keeping
    n. Other technology I frequently use

    _____
    _____
    _____

15. What issues are you experiencing as a teacher using technology? Please share any information that reflects your teaching experiences by checking all that apply and add additional information at the end.
    a. Programs too difficult to use
    b. Not enough time to plan for technology use
    c. Not enough support when problems occur
    d. None
    e. My personal experiences with technology not included

    _____
    _____
    _____

16. I feel that I have grown as an educator through the use of technology and student-directed activities. Please choose those that apply and share any information that will help understand your growth as a teacher due to technology immersion.
    a. I frequently use computers and electronic equipment
    b. I try to incorporate when equipment is available
    c. I avoid the use of electronics and students working together
    d. A student directing their own learning through technology does not prepare students for their future
    e. Students benefit from student-directed technology assignments
    f. The content are does not lend itself to technology student-directed activities
    g. It is important that the teacher direct all activities in the classroom
    h. Students have become more sophisticated in technology and benefit from student-directed activities
    i. Student input into the curriculum benefits learning
    j. My teacher-directed strategies were successful and will be in the future
    k. Additional personal description of how you have changed as a teacher due to technology

    _____
    _____
    _____

17. I have grown in my use of technology and technology immersion in several ways. Choose all that apply. Please feel free to add any additional information that might show your personal experiences.
    a. Emails to students and parents
    b. Electronic gradebook
    c. LCD projector
    d. Video sharing to enhance lessons
    e. Electronic tablets
    f. Social media sharing such as Facebook
    g. Blackboard assignments and discussions
    h. Electronic pens
    i. Skype and other interface programs
    j. Quizdoms and other electronic testing technology
    k. Class websites for student use
    l. Student computer use on a consistent basis
    m. Very seldom use technology

    _____
    _____
    _____

18. Completing professional development programs help address, my technology needs through the following. Please feel free to add any additional comments or opinions that apply to your personal professional development experiences.
    a. Showing me how to use technology
    b. Giving me new ideas to plan daily activities
    c. Increases my confidence using technology
    d. Do not give me enough information to carry back to the classroom
    e. My personal technology needs through PD not included above

    _____
    _____
    _____

19. How does technology support affect your consistent use of technology? Please add additional information that may help understand your experiences.
    a. It does not affect me at all
    b. It makes me feel as if I can overcome frustrations
    c. It creates additional stress and frustrations
    d. It is not useful at all
    e. My personal experiences with technology support that more fully describes my situation

    _____
    _____
    _____

20. How does technology support affect your use of study-directed technology? Choose all answers that apply. Please add additional comments at the bottom.
    a. It does not affect me at all
    b. It makes me feel as if I can overcome frustrations
    c. It creates additional stress and frustrations
    d. It is not useful at all
    e. Other

    _____
    _____
    _____

21. What has been the effect of technology immersion in the classroom in your experiences over the past several years? Please choose any answer that applies.
    a. Education has declined as students use technology
    b. Using technology does not benefit student success
    c. Technology immersion slows down the process of learning
    d. The use of technology has increased over the past several years
    e. Students seem to be more enthusiastic about learning when using technology
    f. Technology immersion is too difficult to work into lessons
    g. Technology student-directed activities have not benefited student learning
    h. Teaching using the traditional methods of teaching benefits student success for the future
    i. Immersing technology has increased over the past several years
    j. My students have grown and benefited from technology student-directed activities
    k. Being a part of preparing students for their technology future is rewarding as a teacher

    _____
    _____
    _____

22. The culture of the school impacts my use of technology. Choose all answers that apply. Please add any additional comments.
    a. The school culture make me feel comfortable using technology, student-directed strategies
    b. There is sometimes a reminder to use the computers
    c. There are conversations and an excitement regarding technology use
    d. The administrators does not seem to care whether or not technology is used
    e. Teachers do not have an emphasis on technology strategies
    f. Teachers are encouraged to use technology
    g. No one cares how teachers teach or the strategies teachers use
    h. It is unclear the attitudes the school has toward technology
    i. Additional observations about the school culture and student-directed technology immersion

    _____
    _____
    _____

23. The district's 21st century technology emphasis is supported through our professional development. Please choose all answers and add additional comments if needed.
    a. By offering opportunities for technology use
    b. By encouraging the use of technology
    c. By constantly asking what is needed by teachers
    d. Is not supported at all
    e. Other.

    _____
    _____
    _____

24. Technology skills will be needed by all students in the future in order to be successful in a digital world. Choose all answers that apply.
    a. Technology skills are essential for all students
    b. Technology will not make a difference in student success
    c. There is not enough technology in the world to make a difference
    d. Students will be successful whether or not they are technologically proficient
    e. Technology will be a passing fad in society
    f. Students simply need to read and write and they will be successful
    g. Other opinions I hold regarding technology immersion.

    _____
    _____
    _____

25. Through my reflections on my responses to these questions and responses, I feel as if I have changed my teaching strategies after technology-based professional development. Please include all that apply.
    a. I have changed my teaching strategies
    b. My teaching strategies have not changed
    c. My teaching strategies will change in the future
    d. I am not sure if my strategies have changed
    e. I am not sure if strategies need to change
    f. Additional comments to explain my experiences

    _____
    _____
    _____

Appendix G: Archival Learning Logs

Public Schools, Learning Log **School Name/Cost Center _____**
Date/Date Range_____ **PRINT** **Name(s)_____** **Signature:_____ Employee ID(s) _____**
Activity Number_____ **Total Number of Hours Possible_____**
Title of Activity/Topics of Discussion
List Concepts/Strategies Learned from Sessions: See Form 278– "Primary Focus of Activity"
Classroom Applications to Increase Student Achievement
Reflections/Evaluations/Assessment

Principal/Designee Signature _____Date_____

Curriculum Vitae

PEGGY B. JOHNSON

Degrees Awarded

Ed. D. in Administrative Leadership, Walden University,
M. A. in Secondary Education
B. A. in Sociology and Social Work

Experience

Administrative and Leadership Certification
English, Reading, Gifted Education and Sociology Certification
AdvancEd Digital School Division Lead and Assistant Evaluator
National Board Certified Teacher in English Language Arts in Adolescence and Young Adulthood
Summer Institute for Literature, Oxford University, Oxford, England
Phi Delta Kappa International and Delta Tau Kappa Honor Society
Adjunct: Collin County Community College, Plano, Texas, English
Presenter University of Florida, College of Education: Technology
Presenter Florida Gifted Association State Convention: Gifted Skills

Curriculum and Instruction

High School

English Chairperson and Advanced Placement Teacher
English I, II, III, IV, Academic, Honors, and Correlated Transition
Advanced Placement Language/Literature and Composition
Pre-Advanced Placement Literature and Composition
High School Gifted Coordinator; Gifted Research/Methodology
National Honor Society Adviser; National Beta Club Adviser
Student Council Adviser
Prom Committee
Student Activity Director, senior class activities
Creative Writing, Technical Writing, SAT Preparation, UIL
Literary Magazine Advisory

Additional Education

National Board Certified Teacher for 10 years
Advanced Placement English Literature and Language and Gifted
International Baccalaureate Literature and Language
SAT and ACT Strategies
Cognitive Coaching
Socratic Seminar

Advanced Training

Digital and Blended Learning
Advanced Training; Boys' Town Discipline
Love and Logic Discipline
DuPont Management
Portfolio Development
UIL Team Competition sponsor
Computer Technology Advanced Training
Brain-Based Learning
Reality Therapy; Holistic Teaching
Ruby Payne, Poverty in Education Educational Training
Rubric Grading Systems
Creative Writing and Technical Writing Strategies;
Literary Magazine Publications
John Crain Curriculum;
ESOL and Reading Advanced Training
Orange County School District; Department of Social Services
Student Intervention Services and Truancy Officer
Orange County Human Services Planning Council
Grant Writing and Federal Funding

Civic and Volunteer Organizations

Who's Who Among Teachers district local organization
Plano, TX District Strategic Planning Committee
Information and Referral volunteer, Orange County, FL
PTA and PSTO
Chair, Seminole County and Local School Advisory Committee
United Methodist Church commitment and community involvement

Professional Organizations

National Council of Teachers of English
Florida Council of Teachers of English
National Association for Gifted Education
Modern Language Association
National Association of Secondary School Principals