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The Relationship of Faculty Demographics and Attitudes toward Technology Integration

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Walden University

COLLEGE OF EDUCATION

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Brian McKinley

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2014

Abstract

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MA, Frostburg State University, 2004
BS, Frostburg State University, 2000

Doctoral Study Submitted in Partial Fulfillment
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Abstract

Stakeholders in a midsized rural high school district were concerned that faculty failure to integrate educational technologies into instruction was adversely affecting student performance as measured by recent state mandated test scores. The purpose of this study was to determine if relationships existed between faculty age, gender, tenure, and overall attitude toward technology, and the implementation of technology into classroom instruction. Dewey's and Knowles' theories of adult learning were used as theoretical frameworks because they emphasize the practical application of knowledge in the transfer of learning. The research design was a one-time cross-sectional survey of teachers within the district. The data were collected using the Levels of Technology Implementation survey extended to include 5 additional questions about attitude towards technology developed using existing literature and consultation with experts. The convenience sample was comprised of 103 volunteer respondents at 3 midsized rural high schools. Analysis of the data utilized Pearson's correlation coefficients, independent samples *t*-tests, ANOVAs, and ANCOVAs. Findings indicated that technology implementation in classroom instruction for this group is generally deficient. No significant relationships between faculty age, gender, and tenure and technology implementation existed, but attitude toward technology proved to be a significant factor for increased technology implementation into classroom instruction. These findings led to the creation of a professional development program to increase the impact of technology on the transfer of learning. Increasing faculty expertise in implementing instructional technology into classroom instruction will lead to greater innovation in the classroom and improved student outcomes.

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Dedication

This study is dedicated to my family, especially my beautiful, caring, and loving wife Laura, whom I call the "solid rock of my life." She has endured many lonely nights, my mood swings, and many market trips alone so that I could work on this project while also providing me with unconditional support and love during this time consuming process. Without her, I would have amounted to nothing in my lifetime. This study is also dedicated to my beautiful children, Brady and Macie, who often made sacrifices in their lives so “Daddy” could work on his study. You two are the light of my life. I may not have been able to play with you guys as much as usual during the last year and a half, but I will make it up to you in the future. In addition, I dedicate this study to my parents, Gary McKinley and Bonnie Harper, and my brother, Steve McKinley. They have always guided me in the right direction in life and have been the most potent, driving forces behind my success throughout my career. Finally, I dedicate this study to my grandfather, Richard “Gassy” Valentine – the only man I was able to call “Pap Pap” for 11 short years of my life. I have thought about you in every adventure I have been a part of ever since the day you left this Earth. It is a shame that you will not see me become Dr. McKinley….. until heaven.

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Section 1: The Problem

Introduction

Although technology is used in numerous ways in secondary education classrooms throughout the United States and globally, many secondary education teachers are still unable or unwilling to effectively integrate technology into their curriculum and classroom instruction (Jeffreys, 2000; Laird & Kuh, 2005; Klopfer, Osterweil, Groff, & Haas, 2009). While many secondary level educators in the three midsized rural high schools included in this study have access to technology for classroom instruction (i.e. Smartboards, LCD projectors, Internet access, Laboratory software), many are still hesitant to implement technology into their instruction (R.L. King, personal communication, March 15, 2013). R.L. King (personal communication, March 27, 2013) also stated that an inconsistency in the amount of technology that is used in classroom instruction and the amount of technology that is purchased exists for many secondary educators in the three midsized high schools. Holland (2012) stated that "technology use in classroom instruction in these three midsized high schools is at most, dismal" (L. Holland, personal communication, February 22, 2012).

Several possible explanations for the lack of technology integration into daily instruction that may exist in these midsized rural high schools are an educator's age, gender, tenure, and attitude toward technology (Decuir, 2010). I focused on the causes in the classroom instructional practices at these midsized rural high schools to determine if secondary education teacher demographics (age, gender, and tenure) and teacher attitude toward technology affect technology integration in these schools.

While the amount of access and support to technology integration has increased, the amount of technology that is integrated into classroom instruction has remained the same, or decreased, throughout many classrooms across the United States (Cuban, 2001; Green & Eastman, 1994). The requirement by local, national, and global employers for increased technological skills, demanded by the technological advancements of the digital age, has significantly increased expectations for student learning (Laird & Kuh, 2005, pp. 213-214). As a consequence of the demand to use technology in classroom instruction, teacher technology integration accountability has become a major issue in secondary education (Velasquez-Bryant, 2002).

Students, ages 8 to 18, are engaged in social media or entertainment media on average for 7 hours and 38 minutes per day (Dessoff, 2010). Because of the amount of exposure to technology that is currently available, students in today's school systems interact differently, ultimately learning and absorbing information at a more rapid pace because of the immediate access to information (Black, 2010, pp. 92-96). Consequently, secondary education teachers, who do not use the most current technology available or relate the information with the best available technology, can significantly reduce student learning and comprehension of specific subject matter (Prensky, 2009). According to Byrnes (2009), "the fact of the matter is that the longer schools wait to use technology in their classrooms, the further behind their global peers students will become" (p. 52). Educators who are not using technology in the classroom are negatively affecting students who need to be prepared for future technology laden education and the global work environment.

Technology is defined by the International Society for Technology in Education (ISTE) (2009) as “any innovation in action that involves the production of knowledge and processes, which create systems that solve problems and expand human capabilities” (p. 1), and "the branch of knowledge that deals with the creation and use of technical means and their interrelation with life, society, and the environment, drawing upon such subjects as industrial arts, engineering, applied science, and pure science" (Sherwood & Maynard, 2013, p. 187).

According to J. Blank (personal communication, March 24, 2013), there are three basic types of technology that are used in these midsized rural high schools. The technologies that are currently used are information and communications technology (ICT), instructional technology (IT) or educational technology (EDTC), and social communication technology or social networking communication technology (SWC).

The No Child Left Behind Act (NCLB) of 2001 mandated that information and communication technology be integrated into curricula in order for states to qualify for state and federal funding. NCLB required that lesson plans should be written or re-written in accordance to the NCLB guidelines for ICT integration. Educators in turn would need to learn to use and integrate technology (software and hardware) into instruction. Although the NCLB act was disassembled and reconfigured in 2011, the focus on technology integration and preparing students for future technology laden education still remains intact (Dillon, 2012). For the purpose of this study, information and communication technology includes, but is not limited to, the Internet, personal computers, personal digital assistants, smart phones, and tablets.

Instructional technology and educational technology are two terms that are synonymous of each other. Furthermore, "most educators use the two terms interchangeably" (Earle, 2002, p. 6). According to Earle, educational technology encompasses a broad area of technology in all fields of education, whereas instructional technology covers a more content specific type of technology for a specific field of education. Thus, instructional technology is recognized as the more identifiable term in secondary education (Ely, 2008). According to Ely, instructional technologies, such as Interactive White Boards (IWBs), Digital Video Disks (DVDs), tablets, and the Internet, influence educational processes by direct interaction between the student and different types of media. The terms instructional technology and educational technology, for the purpose of this study, will be used interchangeably and will usually be referred to simply as “technology”, and will include: computers, computer hardware, computer software, multimedia software, IWBs, virtual graphing calculators, digital cameras, digital video cameras, IPads, DVD/CDs, and the Internet.

Social communication networks are making an impact for some secondary education educators inside and outside the classroom (Veletsianos & Navarrete, 2012). Boyd and Ellison (2007) stated that social networks are the “web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system” (p. 211). Some examples of SWCs, most known as Web 2.0 technologies**,** for the purpose of this study include, but are not limited to: blogs, weblogs, Podcasts, wiki's, Facebook

accounts, and Twitter accounts. Veletsianos and Navarrete (2012) posited that social networks help build relationships among students and teachers better than traditional methods. However, Selwyn (2009) posited that social networks create potential issues in the field of education. Selwyn posited that student privacy concerns, inappropriate relationship issues, usability issues, and faculty overload are potential problems. In order to eliminate social networking problems, teachers must act responsibly regarding interactions with their students. In other words, teachers must always maintain a professional relationship with their students and remember that virtual conversations should be no different than those in the actual classroom (Foulger, Ewbank, Kay, Popp, & Carter, 2009). Using social networks for appropriate reasons, such as updating homework assignments via a class Facebook page, or a project due date reminder for a class via a Twitter account, will allow students to gain exposure to multiple avenues of technology which can ultimately enhance learning (Veletsianos & Navarrete, 2012). For the purpose of this study, the definition of and use of the word technology will include and consist of ICTs, SWCs, ITs, and EDCTs.

Digital natives (students born after 1981) do not remember, nor can they envision a world without technology (Frand, 2006), and therefore need to be taught with technology during their elementary, middle school, and secondary education (Wang, 2012). Males (2011) pointed to the idea that "digital natives" do not use technology for learning; the technology they use is more for social use and for basic communication. However, the idea of Flipped classrooms is a new trend that is emerging throughout some educational districts. Flipped classrooms are classrooms that do not use any type of

technology and are strictly for homework (Fulton, 2012). Class time is reserved exclusively for teachers to assist with problems. The teacher does not complete any type of lecture or teaching method. Assignments and activities are designed by the instructor to be completed using various types of technology outside of the classroom. These activities include watching and listening to online videos, reviewing lectures online, blogging, researching education topics, viewing podcasts, and reading commentaries. The conclusions and inferences gathered from these activities are to be discussed among the members of the class during the following time period and homework assignments are completed during the specified class time. Flipped classrooms; however, have not made their way into the three midsized rural high schools, the setting for the local problem.

The three midsized high schools have populations of 725, 680, and 860. All three high schools are classified in the lowest population bracket in the state. In addition, the three midsized high schools have approximately the same demographics: White (90%), African Americans (9%), and all other races account for the final (1%). Each school has a teacher population that is approximately 60% female and 40% male (J.J. Harden, personal communication, December 20, 2012).

Recent advancements in the field of technology have made secondary education teaching easier and less cumbersome than in the past (de Oliveira, Martí, & Cervera, 2009). Technological tools, like the Internet, aid in research and social networking. Microsoft Word, which can be used for any discipline area, enables an educator to complete worksheets, tables, and documents relatively quickly and easily in comparison to traditional paper and pen methods, and grading programs allow teachers to complete

grades online, access free lesson plans, and upload grades immediately for student feedback.

Some technological developments have created a digital divide in the education world because of the swift change from one digital tool to the next (American Federation of Teachers, 2010). New technological tools such as SMARTBoards, interactive web lessons, Skype, www.teachertube.com, and SMARTexchange have significantly challenged more traditional teaching methods and ideas through their free web based lessons, pre-designed topic specific lessons, and interactive applications.

Dawson (2012) stated that secondary education teachers are using some types of technology, however, the technology that is being used is only to make regular simplistic educational tasks less burdensome (Hermans, Tondeur, van Braak, & Valcke, 2008). Tasks such as word processing, email, and Internet use are widely employed by secondary education teachers (Meyer & Xu Yonghong, 2009), but tasks that create digital communication or digital collaboration are rarely, if ever, utilized (Jenkins, 2006). Accordingly, Duff, Miller, Johnston, and Bergmann (2012) posited that digital collaboration and communication should be an on-going process between educators and students, in the classroom, as well as, outside of the classroom. Digital communication/ collaboration refer to the specific platforms (SMARTBoards, Moodle, Aspen, etc.) that educators use to transmit ideas, discussions, mini-instruction, and classroom interactions. For example, the IWB technology that exists, allows teachers to put full lessons on a digital screen that has touch recognition. This allows students to interact and become a part of the lesson instead of simply watching the instruction (Duff, Miller, Johnston, and

Bergmann, 2012). Common DVDs can be used to teach by simply using the touch recognition features of the IWB. This does not just encompass the IWB idea; the Internet has a plethora of uses that aide teaching in today's world as well. The teacher can use teachertube.com and post a video of a specific lecture they have taught so students can review the lesson, if absent, or use it as a reinforcement tool as well. In addition, technology like blogs, weblogs, Twitter, MySpace, and Facebook allows students to follow an educator's ideas and thoughts as well as possibly tweet about upcoming assignments, view class instructions, watch interactive videos with connected applets, and homework. Consequently, both teachers and students should utilize these technologies in the classroom setting in order to be productive in future educational and professional settings (Diaz, 2010; Grismore, 2012).

Technology use in secondary education classrooms across the United States has been affected by teachers' perceptions and attitudes (Christensen, 2002), by the amount of training that is needed to become technologically literate (Almas, & Krumsvik, 2007), and ultimately by the amount of financial backing that school systems are offered by local and state governments (Edweek, 2011; Simkins, 2011).

Technology that is needed for classroom instruction is supplied by the local school system. In times of economic recession, finances for technology must be shifted around from department to department. This often results in applications for grants and donations only some of which are actually funded as funds are becoming more difficult to find (J. Blank, personal communication, December 15, 2012). Simkins emphasized that "It is just a chore for schools to keep the lights on and the Internet connected"(p. 9) in

some school districts. Kotrlik and Redman (2005) posited that lack of funding and technology costs are problems that occur with technology integration. Financial troubles exist in many areas of educational systems in our country, especially at the higher education level, with 33% of colleges and universities considered to be on an "unsustainable financial path," and another 28% being "at risk of slipping into an unsustainable financial condition" (KinKade, 2012, p. 1).

However, technology companies and technology itself have not slowed the pace of production and have progressed well beyond the normal research/Boolean search Internet idea of the 1990's (Rycroft, 2006). As a result of this progression, students have independently adopted different approaches to learning and experiencing educational ideas in contrast to standard teaching methods (Wang, 2012). Students are already well versed and comfortable with using technology to structure their environment outside of school (Jones, Johnson-Yale, Perez, & Schuler, 2007). Students interact on a daily basis with technology and therefore should be taught with the same technological tools they already embrace (Shaffer, 2006).

Many school districts are increasing their technological capabilities while depleting other funds to try to accommodate the teachers' technological needs (Rentner & Kober, 2012). "School districts continue to struggle to keep up with the demands of upgrading their technological infrastructure" (Edweek, 2011, p.1). These districts try to encourage teachers to become technologically literate and technologically functional in the digital native era; however, teacher attitudes (Penland, 2011), and teacher age,

gender, and tenure often determine if and how teachers will incorporate technology into instruction (Meyer & Xu, 2009).

Littleton (2010) posited that teachers who view their technology skill level as minimal will not use technology as much as a teacher who views his or her skill level as confident. Littleton further posits that teachers feel inferior to students in regard to technology because they fear students possess more knowledge about technology than they do. Consequently, if the student is more knowledgeable about the technology being used during instruction, the student, de facto becomes the teacher which is problematic. Accordingly, teachers who maintain higher computer skill levels will not feel intimidated by student questions and overall knowledge of technology, and thus, be more open to incorporating technology into their instruction (Moore, 2010).

Incorporating technology into secondary education instruction has an inherent learning curve that is steep for many educators. Because of the pace of technological innovation, that curve will not slow down anytime soon (Fox & Hoffman, 2011; Mueller, Wood, Willoughby, Ross, & Specht, 2008). It is estimated that the learning curve for technology doubles every 18 months (Hicks, 2011). In the 1980's, the Internet was not accessible in many places; therefore, most educators had no reason to incorporate it into instruction in a systematic way. In the early 1990's, many teachers had heard of Microsoft Power Point and the Internet, but using these education tools to full advantage did not occur until the end of the century (Decuir, 2012). Early in the 21st century, while technological innovation grew at a consistent pace, most secondary education teachers

maintained their traditional style of teaching. The technology learning curve became steeper than ever (Mueller et.al., 2008).

Many secondary education teachers hesitate to use available technology because they fear change and are uncomfortable with the change (Dawson & Rakes, 2003). Kotrlik and Redmann (2009) found that interactive technologies are not routinely being integrated into classroom instruction. Technology is available and has been increasing during the past decade, but is still not being used in the secondary education classroom nearly enough (Russell, O' Dwyer, Bebell, & Tao, 2007). Williams (n.d.) stated that 99% of teachers in the United States have access to a computer, and they have had access at that percentage rate since 1999; 84 % had one or more computers in their classrooms. Williams also states that Internet connections were prevalent in 95% of schools, and 63% of classrooms have had access since 1999. R.L. King (personal communication, March 12, 2013) stated that even though technology is available in these three midsized rural high schools, interactive technologies such as SMARTBoard presentations, SMART lessons, DVD/video lectures, DVD/video lessons, Skype, discussion boards, and Internet use are not routinely being integrated into classroom instruction. This technology integration deficiency has limited teacher efficiency and effectiveness. Many secondary education teachers struggle with implementing technology based lessons, internet based research, and overall use of computer systems (Moore, 2010). Kotrlik and Redmann (2009) posited that as the age and experience (tenure) levels of instructors increases, the amount of technology integration in instruction often decreases.

According to Czaja and Chin (2007), older adults are willing to try using interactive technology, but they often have problems using the technology available within existing systems. Usability problems, sometimes referred to as first order barriers, are generally considered to be setting up a computer, inability to access programs and the Internet, navigate through websites via hyperlinks and browser tools, install software, access software and use it correctly, and install and access hardware (i.e. printers, faxes, scanners, etc.). Czaja and Chin stated that many educators have an intrinsic desire to learn and stay current with new trends, but internal (age, gender, tenure, attitude) and external (lack of resources, support, etc.) factors are inhibiting their progression to the necessary competency level.

The characteristics or barriers that interfere with educators integrating technology are called first order and second order barriers. ChanMin, Min Kyu, Chiajung, Spector, and DeMeester (2013) posited that first order barriers (hardware, software, computer problems, Internet connectivity, etc.) and second order barriers (attitude towards technology integration, confidence, student learning beliefs, or intrinsic factors) are affecting technology integration throughout many schools across the nation. Many teachers have tried, or are trying to incorporate technology into instruction, but some districts have neither the software, hardware, and Internet access nor the technological efficacy and attitude necessary to incorporate technology for instruction (Bers, 2010; Gulbahar, 2008).

Liu-Juan (2007) posited that technology integration in the secondary education classroom is extremely important because secondary level educators must prepare

students for the future, create a rich structured technology integrated learning environment, and develop a depth of understanding and critical thinking skills. Educators must understand that students have adapted their lives, as well as their education, around the digital age. Technology has been fully integrated into every aspect of their lives, including some of their educational experiences (Green & Hannon, 2007). Students have a desire to learn; but, Khumalo (2004) stated that teachers were not properly trained when technology implementation initially began and, due to limited knowledge of technology, are not prepared to teach successfully using these methods. Accordingly, Bower (2001) stated that the "fear of appearing incompetent may cause faculty to resist involvement in any activity for which they have not had the proper training" (2001, p. 1). Plair (2010) remarked that the more involved an educator is with technology, technology training, and integrating technology, the more the skills will be applied, and behavior and skills will progress for the better.

> "While technology is an undisputed necessity for the continuation of human living, not to mention the professional activity of the field of educational technology, it must be remembered that technology functions not only as a productive means but also as a device that structures perceptions and realities." (Davis, 2003, p. 11)

This study contributes to the body of knowledge needed to address this problem by identifying the factors that are affecting the amount of technology (SMARTBOARD presentations, SMART lessons, video instruction, video lessons, email usage, Skype, discussion boards, blogs, and Internet use) that is being integrated into classroom

instruction and ultimately affecting the academic achievement of students in these midsized rural high schools.

Definition of the Problem

Various gender, age, and seniority clusters of teachers in three midsized high schools are failing to integrate available technology into their instruction. In general, these teachers do not effectively integrate technology into their subject matter, curriculum, or classroom instruction (Jeffreys, 2000). Many secondary education teachers do not use technology because of both first order barriers (environmental issues such as problems with hardware, software, computer problems, and Internet connectivity) and second order barriers (teachers' beliefs, attitude toward technology, confidence, or intrinsic factors) (ChanMin, et al., 2013). According to S. Lewis, (personal communication, January 8, 2013) despite the professional development opportunities that exist, administrative support that is given, and one-on-one mentoring that has been provided, educators in the midsized rural high schools are still not incorporating technology into their classroom instruction to the fullest extent.

These midsized rural high schools do not have a clause in teachers' contracts that states that technology must be used for classroom instruction; yet, the system's Technology Acceptable Use Policy (TAUP) stated that technology must be used for grade reports and email or for school-related business only. The midsized rural high schools' TAUP policy suggested that teachers need to create an effective learning environment by maintaining a life-long learning relationship with an ever-changing society, promoting different modalities of learning, and using a variation of learning

styles and techniques. In spite of the desire of the local board of education (BOE), a problem still exists with technology integration in this small school district. Accordingly, there are various possible causes for technology integration problems in these midsized rural high schools, including an educator's age, gender, tenure, and attitude towards technology. I attempted to determine if secondary education teacher demographics (age, gender, and tenure (number of years of service) and teacher attitude toward technology affect technology integration in these midsized rural high schools.

Rationale

Evidence of the Problem at the Local Level

The purpose of this quantitative study was to examine three midsized rural high schools in a small city (population 22,000) in the state of Maryland to determine how age, gender, tenure status, and attitude are affecting the integration of technology into secondary educational instruction. For this study I will use quantitative statistical measures to analyze the data that were collected.

Some educational districts face a lack of technological resources because of budgets constraints, proper training initiatives, and lack of leadership skills (Simkins, 2009). M. Beal (personal communication, January 3, 2013), instructional technology coordinator, stated that these midsized rural high schools have not been affected, at least recently, by budget constraints from the technology standpoint. As long as the request is not outlandish (i.e. a full lab of computers or a full classroom of tablets), the educator will normally the technology he or she asks for.

S. Lewis (personal communication, August 12, 2012) stated that at the present time, all secondary education teachers in these aforementioned midsized rural high schools are issued the exact same technology tools to use for instruction. These include a new computer, an LCD projector, and Ethernet and wireless Internet access. However, S. Lewis (personal communication, November 20, 2012) also stated that if the teacher has demonstrated a thorough knowledge of technology use in instruction and uses technology during routine teacher evaluations, or teaches a computer science class, than he or she will be provided additional technology for instruction. He posited that technology in the midsized rural high schools is therefore provided by performance and initiative. If the technological tools are not provided, it is because the teacher declined to attend training or has declined to accept the technology in their classroom.

Plair (2010) stated that these issues are mostly observed in older educators, female educators, and those with either very little educational experience or too many years of experience. Teachers who possess more than the standard issued technological tools are at an advantage; however, in that they have acquired the technology on their own terms. Amidst the fact that all teachers have been given ample amounts of technology and professional development opportunities in the midsized rural high schools, since they are not being used to the full potential, there is still not enough evidence to consider these investments as practical.

Evidence of the Problem from the Professional Literature

Using technology to increase AP test scores, mandated state test scores, and overall grades of students in the midsized rural high schools has become a primary goal

of the local board of education. According to Pasco and Adcock (2011), recent studies have shown that secondary high school teachers and educators in general are becoming resistant to new technology that is advantageous to classroom management and teaching styles. Linn, Singer, and Ha (2010) stated that secondary high school teachers are not the only teachers resisting to change as interactive technology changes: so are college professors. Caldwell (2005) posited that when change happens within an organization or structure, it is not usually smooth and linear as one would expect. As a result of the rigid changes, secondary education teachers are keeping their classroom management and teaching styles the same throughout their entire careers.

Change is not always embraced by secondary education teachers (Melville, Barltey, & Weinburgh, 2012). Too many times the change is accepted or implemented at a professional development meeting, then disappears within a month's or year's time. This is not just a local issue; it is a state and national issue. According to Hutchinson (2009), educators at the local, state, and national levels are failing to integrate interactive technology and are dismal at becoming interactive technology literate. According to Holland (2011, personal communication), the state of Maryland has dropped many programs and has had to implement new curricular changes in the past 4 years due to unsuccessful implementation efforts and student failure rates on state mandated tests. Many teachers resist learning new technology integration practices, and as a consequence, students suffer.

Students are pursuing present technology advances at a faster pace than secondary education and higher education teachers, potentially resulting in a communication gap

between the groups (Chong, Brewer, Angel-Jannasch-Pennell, & DiGangi, 2010). It appears that too many curriculum changes, technology implementations, and state mandated test preparations have overwhelmed teachers in their learning and learning commitments. Irvin (2010) stated that programs, activities, and employment responsibilities are unsuccessful when they all occur at the same time. He posited that if too many job responsibilities (i.e. committee duties, professional development meetings, technology training, etc.) are placed on any one person's agenda at one specific time, it often results in a failure of implementation. Russell et al. (2007) stated that the primary responsibility of teacher education programs is to prepare new teachers for their job roles; including preparing the students for technology integration. This is not occurring at the rate, however, that it should be occurring. To rebut this claim, Walker and Shephard (2011) studied the effects of integrated interactive technology into an elementary school classroom. The pair found that teacher attitude toward technology can be increased through interactive technology integration exposure and on-going professional development, but not by themselves.

Definitions

Age: A person's age is determined to be how long someone has existed on Earth. Age is one of the independent variables that will be used in this study to determine if it is a factor that affects how much technology is integrated for instruction (Kooij, de Lange, Jansen, & Dikkers, 2008).

Attitude: A person's overall attitude toward an object is seen to be function of (a) the strength of each of a number of beliefs the person holds about various aspects of the

object and (b) the evaluation the person gives to each belief as it relates to the object (Rao, 2010). Attitude is how positive or negative, favorable or unfavorable, or pro or con a person feels toward an object (Rao, 2010). Attitudes are learned pre-dispositions to respond to an object or class of objects in a consistently favorable or unfavorable way (Roa, 2010). Attitude will be used as the covariate variable to the study.

BOE: The Board of Education (BOE) is the elected body of colleagues who write curriculum, design rules and outcomes for hirees, retirees, and firees, and run the school system in the aforementioned district (Perlozzo-Cross, personal communication, 2013).

Digital Native: Any person who was born after 1981 and has coexisted with technology since their birth (Prensky, 2001).

E-learning (Electronic Learning): "Learning facilitated by the use of digital tools and content that involves some form of interactivity, which may include online interaction between the learner and his/her teacher or peers" (Ministry of Communication and Technology of New Zealand, 2008, p. 1).

ICT: Interactive and Communications Technology. ICT is any type of communication that is completed with the use of technology (Genc, 2011).

Interactive White Board (IWB): See SMARTboard definition.

Newbie: Any person who is new to a specific task or activity (TechTarget, 1999). For example, you are a newbie when you tweet for the first time (TechTarget, 1999).

Skype: "An Internet protocol telephone service provider that offers free calling between subscribers and low-cost calling to people who don't use the service (Rouse, 2009,p.1) or want to use the Internet for free phone calls.

SMARTBoard: Is an electronic Interactive White Board. A SmartBoard is an interactive whiteboard, designed by Smart Technologies, that uses touch sensitive recognition for user input in the same way normal PC input devices, such as a keyboard, mouse, or stylus, direct input onto a computer monitor (WiseGeek, 2012).

Social Media: Social instrument used for communication purposes. These include blogs, weblogs, Facebook, Twitter, MySpace, and YouTube (Nations, 2012).

Technology Acceptable Use Policy (TAUP): The school district's TAUP document is a document that must be signed by all teachers in these midsized rural high schools in order to access or use the district's technology. It is a binding contract that states teachers will use the technology for school-related work, use the technology appropriately, and not for personal business (TAUP, 2008).

Technology integration: incorporation of technology into curriculum and instruction (Anderson & Dexter, 2005).

Tenure: Number of years of service at the same institution or organization (Batiuk, 2013, personal communication) "Continued employment until voluntary retirement or resignation" and " "Economic security that (a) cannot be compromised based on scholarship or teaching that falls within the limits of academic freedom, and that (b) includes: An adequate salary that is not reduced during the term of employment except for adequate cause and after fair procedure ; and adequate benefits the value of which is not reduced during the term of employment except for adequate cause and after fair procedures" (University of Michigan, 1994, 13). Tenure is an independent variable in this study, measured by years of experience/service, and will be used to determine if it is

a factor of technology integration in instruction.

Twitter: A social network that is used to communicate to other people who "follow" your ideas and ideologies. Posting quotes, ideas, and paraphrased statements is called "tweeting." (TechTarget, 1999)

Virtual Manipulatives: An interactive website or application that allow students to virtually explore subject matter within the context of the Internet (DeCuir, 2010).

Significance

This study adds insight into how teachers' attitudes toward technology and factors like age, gender, and tenure impact classroom technology instructional practices. It informs stakeholders about possible demographic and attitudinal characteristics that influence educators to use technology in classroom instruction. By identifying and analyzing possible causes of or barriers to technology integration, this study can help many school districts maintain, sustain, and support teachers with technology integration practices.

Guiding/Research Question

These midsized rural high schools have technology that is readily available to all secondary education teachers. The technology that is available in the local school district is being used for its intended purposes; however, it appears that the ratio between the amount that the technology costs and the time it is actually used is dismal (Holland, personal communication, 2012). In these schools, where first order barriers have largely been overcome, there are still many second order barriers (age, gender, tenure status, and attitude) that possibly affect the lack of technology integration in instruction.

The main research question that was explored is as follows: Do secondary education teacher demographic characteristics and attitude toward technology affect the amount of technology that is integrated into their classroom lessons and instruction? This study will be designed to answer the following research questions about which demographics affect the integration of technology into secondary education classrooms in the midsized rural high school the most:

1. How strongly is the variable of age associated with technology use in instruction?
2. Do males integrate technology more than females?
3. How strongly is the variable of tenure associated with technology use in instruction?
4. Does a positive attitude toward the integration of technology into classroom instruction affect how age, tenure and gender are related to technology use?

Review of the Literature

This section is a review of the literature regarding the effects of age, gender, tenure, and attitude toward technology and the status of integrating technology into secondary education instruction. The topic of technology integration into instruction among secondary education teachers use has been previously reviewed, reported upon, and studied by many researchers. Examining the technology integration practices across three midsized rural high schools will help identify the effects that age, gender, tenure

status, and educator attitudes toward technology will have on technology integration in the local school district as well as nationally.

"Technology is an ever-changing tool for educators to use to enhance learning within schools" (Littleton, 2010, p. 9). Technology, in the form of SMARTBoards, IWBs, tablets, Applets, Internet access, digital communication platforms, and virtual conferencing, has made teaching less cumbersome than ever before. SMARTBoard lessons, SMARTExchange lessons, and digital communication platforms allow teachers to retrieve pre-designed lessons, communicate with administrators, supervisors, and other educators more efficiently, via email, Instant messaging, and Facebook, and retrieve real world data instantly (Starr, 2012). All of these technologies eliminate the need to recreate a lesson or lecture and also supply students with data that is correct and up-to-date, and create less busy work for educators.

Littleton (2010) posited that even though technology is more prevalent in schools during this decade than the previous decades, many educators are still reluctant to integrate technology into their curriculum and instruction. Littleton found that technology is at the forefront of learning, the stakes are higher than ever before, and teachers need to learn technology and adapt to using it during instruction.

The literature review gives further details about the various factors that possibly impede secondary education educators from integrating technology into instruction. The literature review, which was performed through the local library, discussions with local college professors, phone calls to college professors throughout the United States, the Walden library, Google Scholar, ERIC, Educational Research Complete, and ProQuest

Dissertations and Thesis, provides a comprehensive overview of how age, gender, tenure, and educator attitude relate to the integration of technology in secondary education instruction. The key search terms for this project study included, but were not limited to the following: *technology, technology integration, age, gender, years of experience, tenure, tenure status, attitude, self efficacy, social networking, educational technology, communication technology, older people, men, women, and computers.* Any information found via Google Scholar was then researched in one of the aforementioned databases for validity and reliability. Peer reviewed journals, books, and articles provided most of the content for the research. In total, more than 95 peer reviewed journals, peer reviewed articles, and books were used to complete the research portion of this study.

Theoretical Framework

The theoretical framework for this study was based on Dewey's (1938) research that encompassed learning through experiences and Knowles' (1960) six assumptions that guide adult learning. Each theory has its own place in the investigation of this study.

Dewey (1938) found that learning is based on the experiences of the learner. Dewey focused on the idea that the development of learning stems from experiences that shape beliefs, attitudes, and further learning for future engagements and educational situations. Dewey emphasized that individual experiences are the basis of knowledge and understanding. Dewey posited that throughout the process of aging, a learner will gain knowledge through experiences, and gain knowledge through encounters with adversity, other human beings, and objects that create mental stimulation. The learner

must use these experiences as the link between prior knowledge and new knowledge to create an effective and efficient learning environment (Dewey, 1938). Dewey stated,

> The formation of purpose is ... a rather complex intellectual operation. It involves, (a) observation of surrounding conditions; (b) knowledge of what has happened in similar situations in the past, a knowledge obtained partly by recollection and partly from the information, advice, and warning of those who have had a wider experience; and (c) judgment which puts together what is observed and what is recalled to see what they signify. (Dewey, 1938, p. 68-69)

Knowles (1984) research reinforced Dewey's ideas about how adults learn. Knowles explained that his six assumptions of adult learning theory shape an individual's behavior by building upon prior knowledge, skill sets, and experiences. Knowles' six assumptions of adult learning or andragogy are:

1. As a person matures, his or her self-concept moves from that of a dependent personality toward one of a self-directing human being.
2. An adult accumulates a growing reservoir of experience, which is a rich resource for learning.
3. The readiness of an adult to learn is closely related to the developmental tasks of his or her social role.
4. There is a change in time perspective as people mature from future application of knowledge to immediacy of application. Thus, an adult is more problem centered than subject centered in learning.

5. The most potent motivations are internal rather than external.
6. Adults want to know why they need to learn something before undertaking learning.

Regardless of the specific discipline a teacher may teach, Knowles' (1984) adult learning theory promotes the idea that educators have the ability to use their prior knowledge and skill sets to explore, experiment, evaluate, and determine what types of current technology, or even technology that is outdated, would be most beneficial to their instructional techniques. According to Crawford (2004), adult learners usually learn tasks at a modest, but deliberate pace, and learn the skills efficiently, especially when the knowledge is needed to perform their job effectively and efficiently. Thus, if Dewey and Knowles are correct, learning new technologies and interacting with technology on a daily basis should provide opportunities for secondary level educators to increase their technological skill set, reflect on these processes, and apply the knowledge and skills in the classroom.

Knowles (1984) postulated that learners must recognize and formulate their own learning objectives and establish their own learning styles and needs before educators try to implement the ideas. Brookfield (1986) posited that adults engage and facilitate learning on their own terms; citing that participation is completely voluntary.

In conjunction with Knowles' ideas, Cross' adult learning theory states that aging, life phases, and the developmental stages of life affect learning and your learning processes as well (Cross, 1981). Cross posited that age and your life processes affect how adults learn, ultimately affecting how students learn in any educational setting. She

stated that age affects sensory motor capabilities (i.e. eyesight, hearing, etc.) but intelligence (decision making abilities, reasoning, etc.) tends to improve. Cross also stated that life stages (marriage, job status, etc.), which are usually directed to age, affect learning as well. Cross posited that situational characteristics affect learning. She stated that there are two types of conditions where learning occurs: part time learning vs. full time learning and voluntary vs. compulsory. Cross stated voluntary learning is strongly affected by schedules, locations, and procedural processes, but compulsory learning is self-directed and problem-centered in nature because it is normally learning that must be completed to perform your job effectively and efficiently. Cross formulated these assumptions:

1. Adult learning programs should capitalize on the experience of participants.
2. Adult learning programs should adapt to the aging limitations of the participants.
3. Adults should be challenged to move to increasingly advanced stages of personal development.
4. Adults should have as much choice as possible in the availability and organization of learning programs.

Dewey's (1938) and Knowles' (1984; 1994) theories of adult learning focus on learners' experiences, self-initiated learning, and prior knowledge. As a result of self-initiated learning, the educator has a greater opportunity to discover other avenues of technology integration. For example, an educator from the early to mid 1980s would use a VCR to play a video to initiate student interaction. At that point in time, VCRs were new and rarely used until they became more of a mainstream educational learning device.

The educator then brings his or her prior knowledge to all the new technology that is being designed for education. As a result, if educators use the idea of self-initiated learning to integrate technology into lectures, then as education progresses, educators can continue to integrate instructional strategies and ideas without falling behind the educational world. The same idea holds true for technology: if educators see the advantages to the new technological innovations, then they will teach themselves how to integrate the innovations into instructions by making connections with prior knowledge and skills (Knowles, 1980).

Using adult learning theory as the foundation for this study, I analyzed the relationship between the variables of age, gender, tenure, and attitude toward technology in a secondary education setting at three midsized rural high schools in the eastern United States.

Age

Based on the analysis of experimental research, experts have identified age as one of the variables that affect learning and ultimately affect technology integration into instruction. Kotrlik and Redmann (2002, 2004, 2005, 2009) have stated in numerous articles and research papers that an educator's age is one of the determining demographic factors that affect technology integration in classroom instruction. Specifically, Kotrlik and Redman (2009) found that the amount of technology that is integrated into instruction depends on four demographic or personal variables; gender, tenure, technology anxiety, and age. Waugh (2004) research showed that as age begins to increase, the amount of technology integration decreases significantly. Waugh posited

that when an educator reaches the age of 50, technology use decreases by one-third when compared to their younger counterparts. The primary age range at which an educator uses technology for instruction the most is during their thirties and forties (Kahveci, Sahin, & Genc, 2011). Kahveci et al. (2011) stated that this conclusion is logical because these educators would have been the first educators who were completely trained in college during the digital age. Males (2011), Waugh (2004), and Mumtaz (2000) discovered that a relationship exists between increasing age and tenure and lack of technology use and thus claimed that the older an educator tends to be, the less the educator uses technology in his or her instructional practices.

Caffarella, Merriam, and Baumgartner (2007) posited that biological factors, especially age, affect learning processes (p. 302). Caffarella et al. (2007) stated that the body and its primary functions are affected when the body begins to age. They explained that as a person ages, the mind is affected most drastically during the fifth, sixth, and seventh decades (Caffarella et al., 2007, p. 301); however, Alleyne noted that the mind actually becomes constrained to basic functions during the beginning of the fourth decade (2012). A younger brain, one that is between the ages of 1 and 40, completes involuntary and voluntary functions extremely quickly, but an older brain, a brain over 40 years old, completes normal functions at a much slower pace (Alleyne, 2012). As the brain begins to age, and the body and its functions begin to slow, the motivation to learn is compromised and can ultimately affect the use of technology (Ju Chun Chu, 2010).

Cafferella et al. (2007) stated that two distinct characteristics of aging are the loss of vision and hearing, which if not corrected or modified, ultimately create problems with

a person's learning processes and procedures. Cafferella et al. stated that vision loss also affects a person's ability to use technology, especially reading computer screens (p. 302-303). Wlodkowski (2008) also asserted that older adults have difficulty processing visual information from computer screens, projection screens, printed materials, and films (p. 37).

Sultan (2008) found that "with increasing age comes increased visual impairments and vision loss" (p. 1). Vision loss is defined as 20/60 by the World Health Organizational Group on the Prevention of Blindness (1972). Sultan stated that nine million Americans over the age of forty suffer from the four main debilitating eye problems: age related macular degeneration, cataracts, glaucoma, and diabetic retinopathy. Sultan proclaims that over 13 million people will have vision problems by the year 2020, while, Bambara (2009) found that 16 million Americans already suffer from vision loss. Even though these authors have different estimates and figures about vision loss, one thing remains true, many Americans suffer from vision loss, and vision loss impedes learning in the later years of adulthood.

Hearing loss can also cause problems within learning processes and procedures (Cafferella, et al., 2007, p.302). As adults tend to become older gradual changes in the inner ear and tinnitus, affect hearing and thus, learning. The gradual changes of the inner ear affect the amount of sound that is heard, because the structures become less responsive to sound, and tinnitus is a condition that creates a ringing noise with no external stimuli present (Whitbourne, 2005). Tinnitus alone affects two to three million Americans (Ahmad & Seidman, 2004).

Wlodkowski (2008) described that older adults develop a "translation" problem as they age and have a difficult time deciphering rapid and erratic speech. According to Bee and Bjorkland (2004) and Wlodkowski (2008), hearing loss is a progressive but steady process that increases with age, generally starting in the thirties affecting males more often than females. Kline and Scialfa (1996) added to this research and found that the process of hearing loss begins in the thirties, but most adults do not notice any distinct changes until their 50s and 60s.

The decrease of or lack of use of interactive technology integration in secondary education across the nation is attributed to more than just age, but age is one of the major contributing factors. Kooij, de Lange, Jansen, and Dikkers, (2008) suggested that age-related physical factors, as well psychological factors, may influence an educators motivation to complete work related tasks, but environmental factors at an educator's place of employment can intercede how age-related concerns are construed. Ju Chun Chu (2010) examined how age affects technology integration. The author reports that middle aged and older adults are at the biggest disadvantage in the digital divide. The author stated that gender and age alter the paths of motivational factors for learning new information and this lack of motivation to learn ultimately affects technology integration in the secondary education classroom (p. 263). This lack of motivation to learn creates a barrier to learning new technology and applying it in instruction (DeCuir, 2010, p. 32).

Meyer and Xu (2009) designed a causal model to explain technology use among faculty in higher education. Age, highest degree acquired, and work load influenced technology use, and the results indicated that younger educators use the Internet and

technology more often than older educators. They stated that “age is also a significant predictor (-.0999), suggesting that older faculty are less likely to use the web while teaching” (p. 65).

Czaja and Chin (2007) reported that older adults believe they are capable of learning new technology as long as it is readily available, but feel as they age, if the technology is not present, they will be unable to learn technology and stay up to date with the latest trends. Technology use by educators is widespread in secondary and higher education; unfortunately, it is often not the type of technology which enhances instruction and student outcomes. Instead, it is most often personal benefit technology such as email, Internet purchases, and Internet searches (Meyer & Xu, 2009). Consequently, secondary educators are using personal benefit technology in their private lives, but they are not making the transfer of technology use to the secondary education classroom (Russell, O' Dwyer, Bebell, & Tao, 2007). Some authors feel that older educators who are in the later stages of their careers, 22 years of experience or more, and beginning to bring their careers to closure, “choose not to adopt and seem to wish they could go back to the “good ‘ol days.” (Gillard, Bailey, & Nolan, 2008, p. 22-23).

Cross' (1981) adult learning theory states that aging, life phases, and the developmental stages of life affect learning and your learning processes. The idea that age and your life processes affect how adults learn, ultimately affects how students learn in a secondary education setting because of the influential factors that occur directly from education. The theory, as it is applied to this study, suggests that age is a determining factor of learning.

Gender

Based on the analysis of experimental research, experts have also identified gender as one of the variables that affects technology integration into instruction. Zhou and Xu (2007) stated that in regard to technology integration, "gender differences have attracted attention in today's educational research and practice" (p. 1). Meyer and Xu (2007) stated "with faculty technology use in teaching as the outcome variable, the proposed model suggests that there are direct effects from age, gender, education level, and academic discipline in this output measure" (p. 60). Steele (2006) stated that the gender gap in computer training and education has declined in size, but a gap still exists at the teacher education level.

Mims-Word (2012) found that females were abundant in the computer technology field just as early as men. Mims-Word noted that Lovelace, Goldstein, and Hopper were among the first women to create programming languages and work in the computer technology field, however, this was in the industrial market, not at home or in education (Mims-Word, 2012). Her findings stated that males start working with computer technology earlier than females, tinker with computer hardware more than females, and are introduced to computer technology earlier than females. Sutton (1991) and Kay (1992) also reported that males tend to possess a better attitude toward computer technology than females. Mims-Word's research did not find definitive results as to the effect gender has on technology integration in the classroom, she posited that differences do exist in various aspects of technology use and reported that males tend to "program"

and “game” more often than females, and females tend to trainings and software use classes for Microsoft word, PowerPoint, and Excel (Mims-Word, 2012).

Zhou and Xu (2007) studied the effect that gender plays in adopting technology. They found that males had more interest and felt more comfortable in using technology in instruction. The authors stated that females had a lower learning confidence index toward technology and learned more technology skills from other counterparts, whereas males learned more by self-directed learning methods. Venkatesh, Morris, Davis, and Davis (2003) researched technology performance and found that males performed task oriented procedures more prominently than women, and that this was consistent with other studies involving technology and gender including Kirchmeyer (1997) and Lynott and McCandless (2000).

Spotts, Bowman, and Mertz (1997) also showed that differences do exist in technology integration between males and females. Spotts et al. showed that differences occur within knowledge and expertise of technology and technology integration. The authors reported that male faculty possessed more knowledge and overall experience with computer technology than their female counterparts. Females were found to be less confident about their skill set and experience with computer technology. They identified lack of learning time and lack of contribution to professional advancement as the primary influential factors for the decrease in computer technology use, but found that a similar percentage of educators used technology in instruction.

Technology efficacy, specifically, Internet efficacy, has been proven to be weaker among female students (Chen & Tsai, 2007). According to self-efficacy research for

Internet use among adults, men are not influenced in the same manner as women when it comes to self-efficacy of e-learning and Internet use (Ong & Lai, 2006). Durndell and Haag (2002), Durndell, Haag, Cameron, Stocks, and Knox (1997), and Durndell, Haag, and Laithwaite (2000) have completed several studies across eastern and western Europe, Romania, and Scotland comparing gender effects/differences and technology use. Durndell and Haag's (2002) study showed a different aspect, in comparison to studies of the same time frame, concerning the issues of gender effects. The study stressed that male learners showed more positive attitudes and perceptions of the Internet than female counterparts, but when technology efficacy skills were tested statistical against each other, only user experience or amount of technology usage had a significance impact in predicting gender difference. Durndell, Haag, Cameron, Stocks, and Knox's (1997) study from Romania and Scotland found that Romanian students were far less experienced with computers than Scottish students. The study included a similar sample of 227 Romanian students and 136 Scottish students. Accordingly, Durndell, Haag, and Laithwaite (2000) completed a study based around computer self efficacy and gender roles throughout Romania and Scotland. The study included 200 Romanian students and 146 Scottish students. The authors found that males possess a greater sense of confidence of technology than females in advanced file and computer software skills, but basic skills remained to be equal among genders. In contrast, the authors found that Romanian females made up "more than double the proportion of females that were found in similar courses across the UK" in computer classes (Durndell, Haag, and Laithwaite, 2000, p.1040).

Gender has a significant role within education. The role lies within instruction as well as within administration and leadership positions where technology integration is the main focus. Leadership or supervisory roles affect the implementation of technology programs and integration of technology in various ways (Banoglu, 2011). According to Sugar and Holloman (2009), the technology needs to be implemented, not by just one administrator, but by, perhaps, a technology leader or technology coordinator, as well as a technology proficient administration. Conn, Roberts, and Powell's (2009) study found that supervisors who use technology are more likely to positively influence supervisees, educators, and students to use technology; stating that relationships between the parties take longer to develop with technology in this area. Thus, administrators who successfully employ, utilize, and use technology within the working environment are much more likely to influence employees and co-workers to do the same (Rahm, 1999). Banoglu (2011) studied the leadership skills of secondary education principals and their ability to coordinate technology integration throughout a school system. The findings show that principals, both female and male, have performed considerably well in technology leadership proficiency and positive perception of technology use in instruction. Banuglu (2011) noted that many principals perform at the expectation level of professional development trainers. The author posited that female principals were more effective in technology leadership, leadership vision dimension, and more open to collaboration than their male counterparts. In addition, the author stated that female principals are more successful “building up common values and integrating innovations into school activities when compared to male principals” (p. 211).

Although a contradiction between genders about the amount of technology that is integrated into lessons and within leadership positions possibly exists, there is no doubt that gender has an important role in technology integration. Research has placed a different perspective on gender in the field of technology integration. Research has indicated that females dominate participation and attendance portions of SMARTBoard trainings, and professional development trainings, and found that they felt just as comfortable and capable of performing the required duties as male counterparts (McNeese, Hartsell, McGarity, and Harper, 2003). McNeese et al. reported that females are dominating the attendance portion of technology trainings which indicates that females have a positive attitude toward technology integration and feel that integration of technology is important in education. Whether or not an educator is male or female, one thing is tantamount, and that is, supervisors, administrators, and technology coordinators need to reinforce to educators that technology is a valuable tool and is a tool that is not just going to disappear like so many other instructional strategies of the past.

Tenure Status

Based on recent research, the decrease in technology integration in secondary education across the nation is attributed to more than just age and gender. Some researchers feel that tenure is a crucial factor in determining if technology will be used in instruction. Tenure, or tenure status, is an accomplishment that is pursued by educators in secondary and post secondary academic institutions (Tyler, 2011). Tenure provides educators with protection from dismissal, for the content of their scholarly research and

teaching, thus giving educators freedom to conduct their research, and economic stability (Euben, 2005; Hurtado & Harkness, 2008).

College professors have the freedom to use whatever means necessary to teach once tenure is obtained; unfortunately, many choose not to use different methods of instruction because it is not a clause that is stated in their contracts (Surry, Stefurek, & Gray, 2011). In many educational settings, tenure occurs between 3 and 10 years of experience, but can be obtained in 2 years in some educational settings. Cleve (2012) stated that "the majority of states mandate periods of three years; the remaining states range from 1 to 5 years" (p. 3) for a tenure track position. O' Meara (2000) stated that "in most colleges and universities, tenure track faculty have a 5-7 year period of time before they come before a department, college wide and/or university for tenure review" (p. 41). Tenure and years of experience are strongly correlated, but tenure is not correlated with age. Thus, educators can achieve tenure at any age. Most secondary educators achieve tenure status between the ages of 24 and 54; however, this depends upon the time and place of employment. According to the Bureau of Statistics (2012), the median age for tenure at any place of employment was 4.7 years during 2012; using the age of 18 as the starting point (Bureau of Statistics, 2012). Therefore, tenure can be obtained before age 22, however, the percentage of workers that complete this feat is small.

Tenure was intended at the collegiate level to ensure that professors could continue to pursue academic freedom and continue to research without restraint (Ponjuan, Conley, & Trower, 2011; Hurtado & Harkness, 2008). In today's education settings, that is not necessarily the case; especially at some universities and secondary education

institutions. Kinnamon (1990) posited that teachers with 15 or more years of educating experience need to become familiar and practice with technology because computer technology was not part of their pre-service training. Klassen and Chui (2008) found that teacher self-efficacy for class management, student engagement, and instructional strategies decreased from 23 years of experience throughout the end of their career. This is not only true of the United States. Klassen, Bong, Usher, Chong, Huan, Wong, and Georgiou (2009) found that this occurs in international education as well.

Fairweather (2005) posited that in order to motivate faculty to teach using non-traditional methods, there must be a reward system for attaining tenure, and the institutions must place an emphasis on technology and teaching. Although it is not the case for all institutions, many tenure issues revolve around stipends, rewards, or research priorities (O'Meara, 2000, p. 41-49). Many college professors will reluctantly use technology in their instruction if a stipend is rewarded for it (Polly & Diaz, 2009). Wedmen and Diggs' (2008), as well as Stansberry's (2003) research, stated that tenure track professors are more likely to use technology in instruction if there is some type of reward, stipend, or value attached to it. The authors stated that the rewards were usually more technology integration tools, money for purchasing hardware or software, or physical access to more hardware.

Stansberry (2003) studied college faculty and educators and their use of technology in the classroom. Stansberry studied two colleges and the study involved 16 participants from both colleges and found that faculty members perceived the use of instructional technology among non-tenured educators to be extremely risky (2003, p.7).

Stansberry reasoned in his research that using technology, with the possibility of technology not working correctly or insufficiently, would be risky to any educator seeking tenure. Stansberry also found that the more incentives that were offered by departments and administration, the more technology is used. These ideas are similar to Wedman and Diggs' (2008) study about tenure and faculty.

Research has provided us with evidence that age and gender have a salient affect on technology integration, but research has not provided us with an answer as to the affect that tenure has on technology integration. Border (2008) posited that years of experience did not have an effect on technology integration but did imply that age affected the integration of technology. Age and tenure do not have a direct correlation; a close association exists because as age increases tenure acceptance stays at the same level, whether it is three years of service or ten years of service. Surry, Stefurek, and Gray (2011) stated that technology is affected by tenure because tenure ensures academic freedom, and academic freedom allows an educator to pursue whatever means necessary to educate his/her students. Thus, from their point of view, tenure, as it is used in the secondary education school setting has a profound effect on technology integration.

Educator Attitudes toward Technology

As technology has progressed through the last few decades, teacher's attitudes toward technology have become a major prerequisite for determining if the teacher was going to be successful in integrating technology into instruction (DeCuir, 2010). Lawton and Gerschner (1982) stated that a close relationship exists between teacher attitudes and technology usage. Genc (2011) posited that "attitude affects behavior and is linked to

usage, and it is important for in-service teachers to have a positive attitude towards ICTs" (p. 2466). Christensen (1997) pointed out that positive attitudes toward technology integration are directly correlated to positive experiences when using the technology to its full potential. Thus, as an educator becomes more familiar with any type of learning tool, the fear and anxiety that is attached to the tool disappears with this familiarity (Lloyd & Gressard, 1986).

Lawton and Gerschner (1982) posited that there is a close connection between a teacher's attitude and the amount of technology the teacher chooses to integrate into instruction. The importance of a positive attitude, while maintaining openness toward learning new concepts, teaching styles, or instructional strategies in classroom instruction will help to guide instructional behaviors for a lifetime (Pajares, 1992; Bandura, 1997). Al-Zaidiyeen, Leong Lai, and Fong Soon (2010) researched attitudes toward technology integration in Jordan schools. The authors found that one of the main factors for integrating technology into instruction is the attitude the educator possesses towards the technology. The authors concluded that "the attitude further related to the usage frequency of technology and usage amount of the technology" (p. 3) will determine if the teacher will use the computer as a teaching tool in instruction. In addition, their results indicated that educators held a negative attitude toward technology use in the classroom and thus did not use technology in instruction. Albirini (2004) reported similar findings in their research on attitudes and technology use in international education as well. The authors found that technology usage was directly correlated with a positive outlook and attitude toward the technology implementation. The research provides the literature base

with one central conclusion: attitude toward technology does affect technology integration into instruction (Albirini, 2004, p. 5).

The responsibility of integrating technology into classroom instruction is shared by many people: Administrators, supervisors, and trainers all have a role in the integration of technology and their positive attitude toward technology integration is a key factor (Littleton, 2010). Langran (2006) stated that in order for an educational setting to be proficient in integrating technology in instruction, administrators must provide the school, that is educators and students alike, with insight about the technology to be implemented, stay involved with the planning processes of the implementation, and show that they, themselves, are proficient with the new technology.

School leaders and supervisors should provide educators with tailor made professional development so that it fits the individual needs of the educators in that specific setting (Brooks-Young, 2006). The role may be small, for example, purchasing the tools for usage, or large, actually showing educators how to correctly use the equipment in a meeting, but, it needs to be individualized so "specifically relevant professional development information" is relayed to the "appropriate context" (Howland, 2009, p. 4-6). Conversely, the primary responsibility to integrate technology into instruction is laid upon the classroom instructor’s shoulders thus making it necessary for the instructor to exhibit a positive attitude toward integrating the technology (Beatty, 2003). A teacher's misperception of technologies, whether the technology is information and communication technology, social communication technology, or instructional technology, represents another potential obstacle for integrating these technologies into

instruction. Teachers have incomplete or irrational ideas about integrating technologies into classroom instruction, they are not likely to use any type of technology in instruction (Cakiroglu, Akkan, & Guven, 2012). Ertmer (2005) stated that the decision to use technology for instruction is a decision that must be personally made by classroom educators. Ertmer (2005) also stated that if we, as a society and educational system, demand that educators are to achieve fundamental changes in classroom instruction, then researchers need to examine teachers themselves and the beliefs they hold about teaching, learning, and technology. Littleton (2010) stated that if professional development training is not adequate enough, then educators must find a way to learn the technology on their own. Brooks-Young (2006) posited that educators are responsible for their own learning, thus, they need to attend technology workshops and conferences on their own. In Brooks-Young's (2006) research, the author points out that inadequate utilization of training pushes educators in a negative direction, ultimately causing the educator to have a negative attitude towards technology use in instruction.

One major issue for educators and administrators for upcoming technology advancements is the attitudes educators possess toward professional development which is required to properly train educators how to use the software, hardware, or equipment. According to Johnson, "a teacher who has not received proper training cannot be expected to utilize the technology" (2009, p. 29) to its fullest potential. In many of today's educational settings, educators have access to more technology than ever before, but the technology is not utilized because the educator has received poor training, not enough training, or the time frame for learning the technology was inadequate (Johnson,

Wisniewski, Kuhlemeyer, Isaacs, & Krzykowski, 2012). Accordingly, Kotrlik and Redmann (2009) also stated that when technology is readily available, it is used more frequently, but when the technology is scarce, whether it is scarce at home or in the place of employment, it is not used nearly as often.

Even though educators are subjected to professional development on a continual basis, conflicts still exist because of perceived attitudes about professional development trainings, professional development time, and technology use itself (Mierzejewski, 2009). Mierzejewski stated that many professional development meetings are considered, just that, meetings, and the information presented in these meetings is forgotten as soon as the meeting is concluded. Mierzejewski reported that in order for technology integration professional development to be successful, "real time opportunities on a frequency level of at least monthly" (p. 94) must exist. The mere existence of the technology may aid the learning process for educators (Ju-chun Chu, 2009), but it is not the only tool for influencing the use of it. Other factors that influence educators to use technology in the classroom include, but are not limited to, a technologically fluent administration, a social network of technologically fluent peers, and a desire to continue with lifelong learning (Caldwell-Hampton, 2008; Decuir, 2010).

Implications

This study will take place in a semi-rural setting with a relatively small number of participants. The research will ask whether age, gender, tenure status, and attitude towards technology affect integration of technology into classroom instruction. If the statistical analysis identifies definitive areas that affect technology integration, I will

provide the findings to the administration of each school as well as the local board of education to make mandatory changes in professional development, technology presentations, and overall observation/evaluation methods.

Summary

Section 1 was an overview of the technology integration problems that many school systems are facing throughout the United States. Although it is a requirement for many teachers to use technology in their instruction, many are still struggling with the basic concept of technology. Most are not willing to integrate technology into their daily lives. Their attitude is the key to making sure that they are continually introduced to new technological concepts and ideas, and push themselves to integrate it into their instruction.

Technology is constantly evolving throughout the world as well as within the educational system (Littleton, 2010. I tried to determine if an educator's age, gender, tenure, and attitude toward technology and technology integration, have an effect on the amount of technology that is integrated into instruction.

According to Decuir (2010), "the ramifications of educators not using technology are eye opening" (p. 52). Decuir posited that educators need to engage in the technological world because students need to have the skills and experience to compete in the job market locally, as well as, globally. In addition, Decuir stated that students who are not prepared to use technology in the classroom, or who are not prepared to use technology in their employment, are being robbed by educators of their education and their future (p. 53).

Adult learning theory played an important role in the design of this study. Adults learn in various ways and through various styles (Gardner, 2006; Knowles, 1980; Knowles, 1984). Knowles' six assumptions of adult learning and Dewey's (1938) theory, theorize that adults, if presented with experiences, both positive and negative, can use the experiences to learn and cognitively grow. Dewey and Knowles both posited that all adults learn through experiences and perseverance.

In Section 2, I describe the methodology and data collection process and the statistical tools used to examine the relationship between the variables of tenure, age and gender, and technology integration into the classroom. I discussed the results of this analysis, and draw appropriate conclusions. In Section 3, I described the development of a project, informed by the research data, to enhance the abilities of secondary school teachers to integrate technology into classroom instruction. In Section 4, I recommended ways to address the problem differently, discusses an analysis of what I learned, and discusses the study's implications, applications, and ideas for possible future research.

Section 2: The Methodology

Introduction

In this study, I explored the relationships between variables such as age, gender, tenure, or teacher attitude toward technology, and the type and amount of technology being used in classroom instruction. Quantitative results were highly reliable, carefully designed, and gave me the ability to explore and investigate causal relationships between variables (USC, 2013). The data were analyzed using Pearson's correlation coefficients, independent samples *t* tests, ANOVAs and ANCOVAs.

Waugh (2004) found that as age increases, the amount of technology use decreases. Klassen and Chui (2008) studied the affect that tenure has on technology integration. Klassen and Chui found that as an educator's years of experience increase, the amount of technology integration decreases. Mims-Word (2012) posited that males and females use technology in the same capacity, except that males start using technology earlier in their lives. Zhou and Xu (2007) formulated that males are more interested in technology and use technology more than their female counterparts. Christensen and Knezek (2000) deduced that educators who displayed a positive attitude toward technology integration are more likely to use technology in instruction than an educator who displayed a negative attitude toward technology.

Research Design

A cross sectional survey design was used. A cross sectional survey design allowed data to be collected from participants in a brief period, or single period, of time (Creswell, 2012, p. 377). This was usually from a single setting during the specified time

period (Creswell, 2007, p. 146). According to Creswell (2003), cross sectional research design is a preferred research method because of (a) the economy of the design; (b) the rapid turnaround in data collection; (c) the surveys are simple; and (d) cross sectional designs provide the researcher the ability to compare various groups of participants based upon attitude, beliefs, and opinions with a single instrument. This survey design was applicable for this study because I could open the administration of the Levels of Technology Implementation (LoTi) survey during any specific time period and allow participants the freedom to take the survey when time was available.

The LoTi survey (see Appendix F) was used for this study. Five demographic questions were answered at the beginning of the survey. The survey, is a 37 item, eight point Likert scale survey that examines the level of technology implementation in instruction and classroom practices (LoTi), personal computer use (PCU), and current technology based instructional practices (CIP). The LoTi survey was designed by Dr. Chris Moersch in 1994 to address the need for higher level thinking and technology use in classroom instruction (LoTi, 2011). For the purpose of this study, five Likert scale questions were added to the original 37 LoTi questions. These questions were created to obtain information about attitudes toward technology integration. The five questions were designed by the researcher and were based upon previous findings about positive and negative attitudes toward technology use in the classroom stemming from DeCuir (2010), Christensen and Knezek (2000), and Brooks-Young (2006). Three other doctoral level educators and the LoTi custom survey staff helped me model the questions to align with the LoTi framework. These five questions were the first section after the demographic

section on the LoTi survey (See Appendix F).

Participants, Setting, and Sample

The research site for this study was a small, Northeastern, semi-rural, public school district with three midsized high schools that are comprised of 150 secondary education teachers. All secondary education teachers in the three midsized high schools were eligible to participate in the study and were asked to participate in the study. The participant ages ranged from 22 years old through 70 years old. In addition, the participant years of experience ranged from 1 year of experience to 48 years of experience. All secondary educators in the three high schools being studied were considered highly qualified by the district's standards and were up to date with state recertification requirements (Harden, personal communication, 2012). The secondary education teacher population was comprised of 45% males ($N = 68$) and 55% females ($N = 82$).

To ensure a valid and reliable study, I included all secondary education educators. Since all available educators were included at the local setting, this was a convenience sample. This allowed for an equal dispersion of the population and their associated subject matter disciplines, as well as an inclusive sample of all secondary level educators. According to Lodico, Spaulding, and Voetgle (2010), "Even though there are no 'hard or fast' rules for determining sample sizes, there are general guidelines to consider when planning a study" (p. 146). Lodico et al. stated that if the population of survey research is less than 200 participants, then all 200 should be tested" (p. 146). The authors also posited that a minimum of 30 participants should be tested if it is a correlational study"

(p. 146). Weimer (1993) posited, "For most purposes, the normal approximation is considered good provided $N \geq 30$" (p.351). Thus, hoping that the completion rate would be approximately 70%, I used all of the secondary educators in the district and invited them to participate in the study to try to ensure enough participation for a quality study. Laguilles, Williams, and Saunders (2011) stated that "response rates higher than 50% are now anomalous, and rates lower than 40% are quite typical" (p. 538). If the initial response rate did not reach at least 70%, I would prompt the participants to complete the survey via email. If at least 106 participants, 70% of the population, did not complete the survey, I would once again prompt the population to take the survey. This procedure was repeated until the 70% level is reached or until saturation occurred.

Instrumentation

The LoTi survey (See Appendix F), is a Likert scale survey that is used to examine the level of technology implementation in instruction and classroom practices (LoTi), personal computer use (PCU), and current technological instructional practices (CIP). The survey consisted of a total of 44 questions. The first five questions were demographic questions, followed by 5 attitudinal questions, and then 34 questions centered around technology. The demographic section had four direct answer questions (i.e. How long have you been educating? What subject matter do you teach? What is your highest level of education? What is the primary grade level you teach?) and 1 interval answer question (What is your age: 22-27, 28-33, ...). The questions involving an educator's attitude toward technology were answered using the following responses: (1) *Strongly Disagree*, (2) *Disagree*, (3) *Neutral*, (4) *Agree*,and (5) *Strongly Agree*. The

answer choices for the last 34 questions ranged from 0 to 7. The answer statements that matched the numeric values were changed to *Never (0), At least once a year (1), At least once a semester (2), At least once a month (3), A few times a month (4), At least once a week (5), A few times a week (6),* and *At least once a day (7)* (Loti, 2012*)*. The LoTi survey was designed by Moersch in 1994 to address the need for higher level thinking and technology use in classroom instruction (LoTi, 2011). The LoTi survey ranked teachers according to their technology implementation, personal computer use, and current technology-based instruction practices with a six level scale: Level 0: Non-Use, Level 1: Awareness, Level 2: Exploration, Level 3: Infusion, Level 4a: Integration (Mechanical), Level 4b: Integration (Routine), Level 5: Expansion, and Level 6: Refinement (Mehta, 2011).

To provide validity and reliability to the LoTi survey, Stoltzfus (2005) completed an extensive validation study on the content domains. Each domain achieved content validity (r = .93). In addition, Schechter (2000) and Griffin (2003) both scored the LoTi survey using Cronbach's Alpha for internal consistency reliability. Schechter reported Cronbach's Alpha values of 0.7427 for Levels of implementation, 0.8148 for CPU, and 0.7353 for CIP. Griffin did not report individual Cronbach's Alpha levels for LoTi, CPU, or CIP, but reported an overall Cronbach's Alpha level of α=.94. The higher the Cronbach's Alpha score, the more aligned the test items were with underlying constructs (Tavakol & Dennick, 2011). Accordingly, Rakes, Fields, and Cox (2006) used the LoTi survey in 2006 to find deficiencies in teacher technology implementation in 11 school districts throughout one Southern state and Berkeley-Jones (2012) used the LoTi survey

to investigate the relationship between teacher technology implementation and Texas state assessment scores. Both studies provided the researchers with evidence that educators are lacking technological skills.

For the purpose of this study, five Likert scale questions, centered upon teacher attitude toward technology, were added to the beginning of the survey. The five attitudinal questions, with input from three other doctorate level educators, were modeled after the LoTi Framework.

Upon receipt of the Data Agreement Use form (See Appendix G) from the LoTi survey company, and with permission granted from the local BOE, as well as the principals of each of the three midsized high schools, the participants logged into loticonnection.com via the internet. Each participant was sent an email that contained a consent form (Appendix E) and the hyperlink for the study. The participants logged into their email account, read the consent form and selected the LoTi Digital Age Survey hyperlink if they agreed to be a part of the study. The participants used a survey specific login password and a participant specific LoTi username (for anonymity purposes) to complete the survey. The participants answered the 37 LoTi framework questions plus the five demographic questions and five attitude-based Likert scale questions. Every participant received an overall LoTi, CPU, and CIP score. This score was recorded by the LoTi survey company; all other data were compiled, and everything was transferred to me via SPSS.

Variables

For the purpose of this study, the independent variables or predictor variables were age, gender, tenure, and attitude toward technology integration. In addition, attitude towards technology integration was the covariate as indicated in the literature (Genc, 2011). This variable was created by summing the five added questions discussed above (See Appendix F). The covariate of attitude was used because of its salience in the literature as an important predictor of technology integration into instruction. The dependent variables for the study were the amount of technology that is integrated into instruction, based upon the PCU scores, and the different types of technologies that are integrated into instruction, which were based upon the CIP score. The LoTi survey (see Appendix F) ranked all participants according to their technology implementation, personal computer use, and current instruction practices with the aforementioned six level scale. The scale runs from Level 1 (Awareness) to Level 6 (Refinement). The main question to be answered by the data: Are the variables of age, gender, tenure, and attitude toward technology integration associated with technology use in instruction and for what amount of time?

Hypothesis and Variables

- Independent variables: Age (interval and recoded into categories), gender categorical), and tenure (interval/ratio and recoded into categories) of the participants or educators in the study.
- Dependent variables: The LoTi, CPU, and CIP scores from the LoTi survey.
- Covariate: Educator attitude toward technology was used as the covariate.

- H_1: The older the educator, the lower the score on each of the dependent variables.
- H_2: Male teachers will score higher than female teachers on each of the dependent variables.
- H_3: Educators with longer tenure in the system will score lower on each of the dependent variables.
- H_4: Educators with a positive attitude toward technology (as measured by five added attitudinal questions, see Appendix F) will score higher on the dependent variables than educators who possessed a negative attitude toward technology integration regardless of age, gender or tenure.

Data Analysis Method

In order to determine if age, gender, tenure, and attitude toward technology affect the amount of technology that is used by the educators of these midsized high schools, I used a correlation design to investigate the affects that age, and tenure had on the amount of technology that is integrated into each educator's instruction. According to Creswell (2012), "It is unethical to not have measured the appropriate control variables" (p. 353), thus, the researcher must account for all possible situations that occur with the possibility of causation, correlation, covariates, and assumptions. The effects of gender were analyzed using an independent samples *t*-test, and calculating eta squared as an effect size.

Before any statistical tests were performed, I performed an Exploratory Data Analysis (EDA) to check all the variables (age, gender, and tenure) for symmetry,

skewness, and normality. Bluman (2012) posited that a researcher should verify that a population distribution is "normal" before proceeding to complete any parametric statistical tests.

To check for normality, I used SPSS to construct a Normal Probability Plot (PP). According to Bluman (2012), as long as the data appear to have a linear shape, then the data should be considered normal. In order to be 100% sure the data was normal or approached normalcy, I used the Shapiro-Walks test for normality. This test is used to check for normalcy in studies with samples less than 2000 participants (Conover, 1999).

The EDA determined if I would use parametric or non-parametric tests. Since the data was parametric, I calculated the means and standard deviations for age and tenure. Once the means and standard deviations were calculated, I further analyzed the data by calculating the Pearson correlation coefficients in order to analyze the relationship between age and tenure and the amount of time that technology was integrated into instruction. Since gender and tenure were categorical variables, I used independent samples *t* tests to compare the means of both genders against their overall LoTi score, PCU, and CIP scores and again to compare tenure status against these scores. Since age contained several categories, I used an ANOVA to compare age groups against their overall LoTi, PCU and CIP scores. Finally, I used an ANCOVA, employing the variable attitude towards technology as the covariate, to determine if a significant difference existed between the groups while controlling for attitude. If the data had been non-parametric, I utilized the Spearman Rank Correlation Coefficient test, a Mann-Whitney test, and a Kruskal-Wallis statistical test respectively.

Data Analysis Assumptions

I used Pearson's correlation coefficients, independent samples *t* tests, ANOVAs and ANCOVA tests to differentiate which variables had the greatest effect on the integration of interactive technology into instruction (controlling for attitude in the case of the ANCOVA). Of the four statistical tests that were used for the study, Lodico et al. (2010) stated that Pearson's product moment correlation "is the most stable test with the smallest amount of error" (p. 229). Green and Salkind (2011) stated that before any of the tests could be performed, the researcher must analyze the assumptions of each test, and determine if the outcomes are true.

Bluman (2012) stated that Pearson's Product Moment Correlation Coefficient is used "to determine the strength of the linear relationship between two variables" (p. 539). Green and Salkind (2011) posited that a researcher must assume the following assumptions to be true before conducting the test: (a) there is normal distribution, (b) population variances of the dependent variable are equal to all levels of the independent variable, and (c) the sample is representative of a random sample.

Green and Salkind (2011) hypothesized that underlying assumptions exist when a researcher wants to use a *t*-test for data analysis. The pair stated that three assumptions must be met in order to perform a *t*-test: (a) the tested variable is normally distributed, (b) the population is comprised of a random sample, and (c) the scores of the test variable are independent of each other. I used Levenes' Test for Equality of Variances to ensure that the population variances were equal. Once this was proven correct, the researcher could continue to analyze the data with an independent samples *t*-test.

According to Green and Salkind (2011), using an Independent Samples t-test, ANOVA, or ANCOVA to test a relationship among variables, a set of assumptions should be verified to be true. These assumptions are:

1. The dependent variable is normally distributed for any specific value of the covariate and for any one level of a factor.
2. The variances of the dependent variable are equal.
3. The cases represent a random sample from the population and the scores on the dependent variable are independent of each other.
4. The covariate is linearly related to the dependent variable within all levels of the factor, and the weights or slopes relating covariate to the dependent variable are equal across all levels of a the factor. (p. 212)

In order to control specific variables, I used an ANCOVA procedure, which is a statistical procedure that allows comparison of the mean scores of the two groups of educators after the effect of the extraneous variable is removed. Controlling for the variable, attitude, allowed me to determine if age, gender, and tenure affect technology integration in instruction regardless of the attitude of the instructor.

If the prior conditions were not met, the data would then be classified as non-parametric, in which case, I would use the aforementioned non-parametric test equivalent.

Assumptions, Limitations, Scope and Delimitations of Study

This study had the following assumptions:

- Honesty, integrity, and willingness of the participants to answer the survey questions could be problematic since the survey was on a volunteer basis and not a clause in their contracts. All participants were assumed to answer all questions with 100% honesty and effort.
- Participants selected for the study could possibly skew the results because the survey was completed online. Therefore, I assumed that technology deficient participants who could not access the survey would not contribute to the "true" results of the study.

This study had the following limitations:

- The LoTi survey was designed using the Likert scale with 8 numbered responses (0-7). Thus, the survey did not contain a section for qualitative interviews or explanatory responses, which could possibly expose a reason for the lack of technology integration in education programs in the mid-sized rural high schools. In addition, the variables (age, gender, tenure, and attitude toward technology) that were measured in the survey were only one specific indicator of possible barriers that affected the integration of technology. It is plausible to suspect that other indicators affected technology integration.
- The study assumed that internal threats, like diffusion and attrition, existed. It was likely that participants would talk to each other about technology integration while data collection was in process (diffusion), and some participants would start the survey but not complete it (attrition).

This study had the following scope and delimitations:

- The study investigated and illustrated the level of technology integration in secondary level education in three midsized rural high schools.
- Various characteristics affected technology integration within individuals. Some of these characteristics included: formal education, formal training, training methods, interest in technology, and background. The scope of this study only focused on the characteristics of age, gender, tenure, and attitude toward technology integration of secondary level educators.
- The survey was administered to secondary education teachers. If the survey had been administered to elementary education teachers, middle school teachers, or higher education educators, the findings could be different.
- Since the study only included three midsized rural high schools, and was restricted to only one district in a state with 26 districts, the study may not have depicted the level of technology integration among all secondary level institutions.
- I used a convenience sample for the study. However, in educational research, convenience samples are not ideal for generalizing results to larger populations (Creswell, 2012, p. 145; Johnson Christensen, 2012, p. 230).

Human Subjects

Since I was conducting research in my home school and a geographical area where he had taught for 13 years, I minimized bias during sampling, data collection, and analysis, by only obtaining demographic variables from the participants. For anonymity purposes, all teachers completed the survey instrument independently and no personal identifying information was collected. To ensure anonymity, all participants used a survey specific login password and a participant specific LoTi to complete the survey. To preserve confidentiality, the LoTi score for each participant was linked to a number code kept by the LoTi data collection software. I did not have access to any of the number codes. All study findings were reported in aggregate so that no individual study participants could be identified.

Upon receipt of the signed letter of cooperation from the Board of Education (See Appendix C) superintendent, I sent an email to the LoTi connection and all participants' email addresses were assigned a specific login password. Once LoTi had all the accounts set up, I sent an email with the consent form (Appendix E) to each participant. Each participant was informed that the study was voluntary, what would occur during the study, what expectations were involved, no health risks were involved, and how complete anonymity would be maintained. All participants were informed that, if at any time, they wanted to withdraw from the study; they would be able to withdraw at any time.

By completion of the survey, the participant provided me with evidence for his/her willingness to participate. Since all participants were over the age of 18, only demographic information was collected, all information was kept completely

confidential, and the study was completely voluntary, protection from harm was achieved. Upon the completion of the survey, the data was collected from the LoTi connection website and I secured it in a safe location. The data was transferred to the SPSS statistical software platform to be analyzed and I interpreted the data. When the statistical analysis was complete, I kept one, and only one, record of the results at my home school on a secure mainframe that is password protected. All of the records will be destroyed after a 5 year period. Any unused data was destroyed by me immediately after analysis.

I was not in a supervisory position nor had he ever been since being hired by the board of education in 2000. The only duties that I completed for the local board of education were regular teaching duties. Therefore, coercion to participate in the study was not present.

Since I was not in a supervisory position, permission to conduct the survey was obtained from the superintendent of schools. I had the superintendent of schools sign a letter of cooperation form (See Appendix C) to authorize completion of the study during professional time (2:40 - 3:10 p.m.). In addition, special permissions were granted to the researcher, both written and verbal, by all three principals at each of the schools for administration of the survey. The principals completed a data collection coordination request form (see Appendix D) and returned it to the researcher before any data was collected.

Researcher's Role

For this study, I was to gather quantitative data from Moersch's (2013) LoTi survey to determine if age, gender, tenure, and attitude toward technology affected technology integration into classroom instruction. Since my data was not qualitative, and the survey was not taken online, my biases and speculations for or against technology integration in classroom instruction would have no effect on the survey results. I did not interact with any secondary education teachers during the open survey period. Although the LoTi survey has been tested by numerous researchers, Stoltzfus (2005), Schechter (2000), and Griffin (2003) to name a few, and found to be reliable and valid, according to Creswell (2012), personal biases and beliefs about the content of any study should also be identified by the researcher to guarantee that the study is valid and reliable.

Results and Findings

Results of this quantitative study were compiled during the 3 week period that data was collected from June 10, 2013 through July 1, 2013. During the survey period, all 152 secondary level educators in the school district were sent the survey via email. Due to retirement, there were 144 participants who met the eligibility criteria of whom 103 completed the survey resulting in a response rate of 71.5%. According to Laguilles, Williams, and Saunders (2011), online survey "response rates higher than 50% are now anomalous, and rates lower than 40% are quite typical" (p. 538). Consequently, my 71 % response rate gave me a good indication that the results were accurate.

While analyzing the results of the survey, I made various connections between age and technology integration in instruction, gender and technology integration in

instruction, years of experience and technology integration in instruction, and attitude toward technology and technology integration in instruction. Using the connections that were established by data analysis, I attempted to answer the four research questions.

Descriptive Statistics

The descriptive statistics of the 103 participants on the demographic variables of age, gender, and tenure were quite atypical for a secondary education population (See Table 1). The sample contained 46 males (44.7%) and 57 females (55.3%). The participants' age ranges were from 21-30 (N = 9, approximately 9%, Males = 4 , Females = 5); 31-40 (N = 30, approximately 29%, Males = 14 , Females = 16); 41-50 (N = 32, approximately 31%, Males = 16, Females = 16); and over fifty (N = 32, approximately 30%, Males = 9 , Females = 23)

Table 1

Sample Description by Age, Gender, and Tenure Status

	Males		**Females**	
Age	Tenure	Non-Tenured	Tenure	Non Tenured
21 – 30	4		5	
31 - 40	13	1	15	1
41 - 50	16		16	
51+	9		23	
Total	42	1	59	1

Note. N = 103

I used the SPSS graduate pack version 21.0 to analyze the data from the LoTi survey. I did not need to calculate Cronbach's Alpha for the LoTi survey because it had already been calculated numerous times by other professors, namely Schecter, and Griffin, within the past 7 years. Schechter (2000) reported Cronbach Alpha values of

0.7427 for Levels of implementation, 0.8148 for CPU, and 0.7353 for CIP, and Griffin (2003) did not report individual Cronbach's Alpha levels for LoTi, CPU, or CIP, but did report an overall Cronbach's Alpha level of α=.94. The goal, while analyzing the data, was to answer all four of my research questions. Those findings are reported in the following paragraphs.

Green and Salkind (2011) posited that descriptive statistics allow researchers to dissect all possible occurrences and variations that occur within a set of data. Building on this idea, I wanted to gain an overall idea of the survey, so I performed basic descriptive statistical tests on all participants to see what patterns emerged. The mean LoTi score for the entire sample was 2.17, the median LoTi score was 2, and the mode LoTi score was 1. The scale for the LoTi scores is from 0 - 6. A "0" on the LoTi, PCU, and CIP scale stands for "Non-use" and a "6" stands for "Refinement." The results place 72.8% of all the educators below the "Exploration" score on the LoTi scale. The results also show that only 27.2% of all participants scored above a 2 on the LoTi, scale and only one individual scored above a 3. Moersch (2013) stated that "At a Level 2 (Exploration) the instructional focus emphasizes content understanding and supports mastery learning and direct instruction. Teacher questioning and/or student learning focuses on lower levels of student cognitive processing (e.g., knowledge, comprehension) using the available digital assets" (Loti, 2013, p. 5).

To ensure that this was a statistically valid conclusion, I conducted a 1-sample *t*-test to evaluate whether the mean was significantly different than 3, the accepted mean for educators in general. The sample mean of 2.17 (SD = 1.121) was different from the

accepted mean of 3, $t(103) = -7.554$, $p<.05$ ($p=.000$). Therefore, I concluded that this difference was significant at the .05 level. The 95% confidence interval for the LoTi mean ranged from 1.95 to 2.38. This provided me with the indication that most of the educators in this school district, after having technology in their rooms for the past 10 years, were still in the exploration phase.

The mean PCU score for the entire sample was 2.49, the median PCU score was 2, and the mode PCU score was 1. This was all based on a scale of 0 - 6. A "0" on the LoTi, PCU, and CIP scale stands for "Non-use" and a "6" stands for "Refinement." This placed 71.9% of all the educators below the "Infusion" score on the PCU scale. The results showed that only 28.1%, or 29 out of 103, of all participants scored above a 3 on the PCU scale. Moersch (2013, p. 5) stated "A PCU Intensity Level 2 indicates that the participant demonstrates little to moderate fluency with using digital tools and resources for student learning. Participants at Intensity Level 2 may occasionally browse the internet, use email, or use a word processor program; yet, may not have the confidence or feel comfortable using existing and emerging digital tools beyond classroom management tasks (e.g., grade book, attendance program). Participants at this level are somewhat aware of copyright issues and maintain a cursory understanding of the impact of existing and emerging digital tools and resources on student learning" (LoTi, 2013, p. 6).

This information provided me with the indication that educators in this school district use computers on their own via email, class attendance, and internet browsing, with only moderate or little knowledge of how to use them in the classroom. The mean CIP score for the entire sample was 3.71, the median CIP score was a 4, and the mode

CIP score was a 4. This was all based on the same scale as the LoTi and PCU scores, thus a"0" stands for "Non-use" and a "6" stands for "Refinement." This placed 56.3%, or slightly more than half, of all the educators above the "Infusion" score of 3 on the CIP scale. According to Moersch, "At a CIP Intensity Level 4, the participant may feel comfortable supporting or implementing either a subject-matter or learning-based approach to instruction based on the content being addressed. In a subject-matter based approach, learning activities tend to be sequential, student projects tend to be uniform for all students, the use of lectures and/or teacher-directed presentations are the norm as well as traditional evaluation strategies. In a learner-based approach, learning activities are diversified and based mostly on student questions, the teacher serves more as a co-learner or facilitator in the classroom, student projects are primarily student-directed, and the use of alternative assessment strategies including performance-based assessments, peer reviews, and student reflections are the norm" (LoTi, 2013, p. 7).

This provided me with the indication that about half of all the educators in the school district use technology in instruction.

Table 2

Number of Responses by Sub-Scale and LoTi Instrument Sub Scale Central Tendencies

									Central Tendencies		
Sub-Scales	0	1	2	3	4	5	6	7	Mean	Median	Mode
LoTi	3	25	48	10	17	0	1	0	2.17	2	1
PCU	8	32	21	14	12	10	6	1	2.49	2	1
CIP	3	6	14	22	26	17	12	3	3.71	4	4

Note. N = 103. Central Tendencies = Mean, Median, and Mode.

Although the PCU and CIP score indicated that instructors are using technology in their personal time, the LoTi, PCU, and CIP scores indicated that predominately all educators, as a whole, are still in the "Infusion" or "Fluency" process and could all use professional development or remediation to support technology integration into their lesson plans and instructional practices.

Inferential Statistics

Research Question # 1

To address the first research question, "How strongly is the variable of age associated with technology use in instruction?," I performed a Pearson's correlation coefficient test that would try to establish if a relationship between age and LoTi score, PCU score, and CIP score existed. In addition, I performed a Pearson correlation coefficient test to see if age and the frequency of technology use in instruction were related.

The Pearson's correlation coefficient test showed that age and tenure were closely related for this school district's population (N=103, r = .788), but age did not have a direct affect on LoTi, PCU, or CIP scores (See Table 3). The Pearson's correlation coefficient for age versus LoTi score was r = .096, p>.05, which was not significant. Since it was not significant at the p <.05 level, there is no correlation and the null hypothesis was accepted. This means there was no relationship between age and levels of technology implementation, personal computer use, or current instructional practices. As well, the Pearson's correlation coefficient for age versus PCU score was r = .103, p >.05, which was not significant. Since it was not significant at the p <.05 level, there is no correlation

and the null hypothesis was accepted. Moreover, the Pearson's correlation coefficient for age versus CIP score was $r = .084$, $p >$, which was not significant. Since it was not significant at the $p<.05$ level, there is no correlation and the null hypothesis was accepted.

Table 3

Correlation between Age and LoTi Instrument Sub-Scales

	Pearson's *r*	*p* value	Significance
LoTi	.096	.334	NS
PCU	.103	.301	NS
CIP	.084	.398	NS

Note. N = 103. NS = Not Significant.*p<.05.

Finally, I performed the Pearson's correlation coefficient test for age versus frequency of technology use in instruction. The Pearson's correlation coefficient *r* value for age versus frequency of technology use in instruction was not significant, $r = .049$, $p>.05$. This was concluded to not be significant; therefore, I accepted the null hypothesis. This specific data analysis provided me with the understanding that age does not affect how often, what types, and how much technology is integrated into instruction.

Finally, since age had already been re-coded into categories, I used a one-way ANOVA to test the relationship between age and specific questions. A one-way ANOVA was conducted to evaluate the relationship between age and technology integration in classroom instruction. The independent variable, age, included four levels: 21-30, 31-40, 41-50, and 51+. The dependent variable was labeled as question #12 on the LoTi survey. In the LoTi survey, question #12 states that "I alone use the digital tools and resources in my classroom for tasks such as planning, preparing, presenting, and/or grading instructional activities" (LoTi, 2012). The ANOVA was not significant, $F(94,$

102) = 1.281, p = .268 (p >.05). This indicated that the test was not significant and I accepted the null hypothesis. The strength of relationship between the age of the participant and the amount of technology that is used in classroom instruction, as assessed by η^2, was weak, η^2= .087, with the age accounting for less than 1% of the variance of the dependent variable, which further indicated that age does not affect technology integration in classroom instruction.

Research Question # 2

To address the second research question, "do males integrate technology more than females?" I used an independent samples *t*-test to determine if a relationship exists between gender and technology use in instruction. I performed the test three times on the construct domains for gender and LoTi score, gender and PCU score, and gender and CIP score (See Table 4).

First, an independent-samples *t*-test was conducted to evaluate the hypothesis that male educators integrate technology more often than their female counterparts using the LoTi score as the test variable and gender as the grouping variable. The test was not significant, $t(101) = -1.04$, $p>.05$, $p= .917$, therefore, the results did not support the research hypothesis and I accepted the null hypothesis.

Secondly, an independent-samples *t*-test was conducted to evaluate the hypothesis that male educators integrate technology more often than their female counterparts using the PCU score as the test variable and gender as the grouping variable. The test was not significant, $t(101) = 1.097$, $p>.05$, $p=.766$, therefore I rejected the hypothesis and accepted the null hypothesis. Male participants (n = 46, M = 2.70, SD = 1.762) on

average scored slightly higher than their female counterparts (n = 57, M = 2.32, SD = 1.734).

Finally, an independent-samples t-test was conducted to evaluate the hypothesis that male educators integrate technology more often than their female counterparts using the CIP score as the test variable and gender as the grouping variable. The test was not significant, $t(101) = -1.439$, p>.05, p= .153, therefore I rejected the hypothesis and accepted the null hypothesis. Male participants (n = 46, M = 3.46, SD = 1.601) scored slightly lower than their female counterparts (n = 57, M = 3.91, SD = 1.596).

Table 4

Differences between Genders by LoTi Instrument Sub-Scales

Sub-Scales	Male	Female	t-test	p- value	Significance
LoTi	2.15	2.18	-.104	.917	NS
PCU	2.70	2.32	1.097	.766	NS
CIP	3.46	3.91	-1.439	.153	NS

Note. N = 103. NS = Not Significant.*p<.05.

Research Question # 3

Thirdly, I investigated the third research question, "How strongly is the variable of tenure associated with technology use in instruction?" to determine if any relationship existed between tenure and technology use in instruction. I analyzed the variable of tenure versus LoTi, PCU, and CIP scores using an independent samples t-test.

An independent-samples t-test was conducted to evaluate the hypothesis that tenured teachers, or teachers with more years of service, do not integrate technology as much as teachers with less tenure (See Table 5). The independent samples t-test for tenure versus the LoTi score was not significant, $t(70) = -.342$, p>.05, p = .733 and thus, I

rejected the hypothesis and I had to accept the null hypothesis. The independent samples *t*-test for tenure versus the PCU score was not significant, $t(50) = .444$, $p>.05$, $p = .659$, so therefore I rejected the hypothesis and accepted the null hypothesis. The independent samples *t*-test for tenure versus the CIP score was not significant as well, $t(50) = .458$, $p>.05$, $p = .652$ and therefore I accepted the null hypothesis.

Table 5

Differences between Tenure by LoTi Instrument Sub-Scales

Sub-Scales	Tenure $n = 101$ (Mean)	Non-Tenure $n = 2$ (Mean)	*t*-test	*p* value	Significance
LoTi	2.15	3	.000	.998	NS
PCU	2.49	2.5	-.025	.801	NS
CIP	3.69	4.5	.009	.927	NS

Note. $N = 103$. NS = Not Significant.*p< .05.

Research Question # 4

I investigated the final research question, "Does a positive attitude toward the integration of technology into classroom instruction affect how age, tenure and gender are related to technology use?" to determine if any relationship existed within these variables. I used an ANCOVA, with attitude as the covariate, to investigate the affects that age, tenure, and gender, have on LoTi, PCU, and CIP scores, while controlling the variable of attitude toward technology, on technology integration in classroom instruction. Attitude was measured using five questions designed by the researcher and based upon previous findings about positive and negative attitudes toward technology use in the classroom stemming from DeCuir (2010), Christensen and Knezek (2000), and Brooks-Young (2006). Three other doctoral level educators and the LoTi custom survey

staff helped the researcher model the questions to align with the LoTi framework. These five questions were the first section after the demographic section on the LoTi survey (See Appendix F).

One-way ANCOVA statistical tests were planned. The independent variables included age, gender, and tenure. The dependent variables were the LoTi, PCU, and CIP scores from the survey. The covariate was attitude toward technology, which was re-coded for the analysis as 1, 2, 3, 4, and 5. For the covariate scale, a "1" indicates a negative or weak attitude toward technology integration, and a "5" indicates a positive or strong attitude toward technology integration. A preliminary analysis was conducted to determine the homogeneity of slopes between the dependent variable and the covariate; an assumption that is usually tested in an ANCOVA test.

Age and Attitude toward Technology Integration

I performed homogeneity of slopes test to ensure that the ANCOVA test could be performed. The covariate, or control variable, should not have a significant relationship with the other test variables. Therefore, if the slope of the regression lines are equivalent or interact significantly, or the slopes are considered homogenous, the relationship between the dependent variable and the covariate are similar and thus, the ANCOVA test cannot be performed (Bluman, 2012).

Here, the homogeneity of slopes test was found to be not significant at the. $p<.05$, $p=.862$ level for the variables of age and LoTi so I proceeded with the ANCOVA.

The simple main effects test was significant for older educators and LoTi scores, while controlling for attitude. For the 21-30 group, $M=1.89$ ($SD=.928$), for the 31-40

group *M*=2.03 (*SD*=.850), for the 41-50 group *M*=2.31 (*SD*=1.355) and for the 51+ group *M*=2.22 (*SD*=1.157)The simple main effects test revealed that *F* (3, 98) = 3.852, *p*<.05, *p*=.053, and the eta squared value, η^2= .017 and therefore, since the test was significant I accepted the hypothesis for age and LoTi. Means were highest for the 51+ group with attitude as the covariant.

For PCU and CIP scores, the homogeneity of slopes test was not significant at the *p*>.05, *p*=.239 level for CIP scores and *p*>.05, *p*=.870 level for PCU scores. Therefore, I proceeded with the ANCOVA.

The simple main effects test was significant for older educators and PCU scores, *F*(98, 103) = 10.861, *p*<.05, *p*=.001, and the eta squared value, η^2= .100. Means as standard deviations were as follows: for the 21-30 group, *M*=2.33 *SD* =1.581, for the 31-40 group *M*=2.17 *SD* =1.487, for the 41-50 group *M*=2.66, *SD* =1.789 and for the 51+ group *M*=2.66 *SD* =1.994. Means were highest for the 41-50 and 51+ groups.

The simple main effects test was significant for older educators and CIP scores as well. The score for the ANCOVA test concluded that, *F* (98, 103) = 11.225, *p*<.05, *p* = .001, η^2= .103. Means and standard deviations were as follows: for the 21-30 group, *M*= 3.78 *(SD* =1.563), for the 31-40 group *M*=3.37 (*SD* =.964), for the 41-50 group M= 3.88(*SD* =1.792) and for the 51+ group M=3.84 (*SD* =1.903). Means were highest for the 41-50 group.

Thus I accepted the hypothesis for both the PCU and CIP scores as well. These tests confirmed that attitude is an important covariate when examining the relationship between technology integration and the age of an instructor.

Gender and Attitude toward Technology Integration

The homogeneity of slopes test for gender and LoTi scores was found to be not significant and was at the $p<.05$, $p=.302$ level. The simple main effects test was not significant for gender and LoTi scores, while controlling for attitude. For the men, $M=2.15$(SD =1.229) and for the women, $M= 2.18$ (SD =1.037). The test revealed that $F(1, 100) = .002$, $p>.05$, $p = .966$ and the eta squared value, $\eta^2= .000$. This is not significant at the $p<.05$ level and therefore I rejected the hypothesis and accepted the null hypothesis. These conclusions about the hypothesis indicate that gender and LoTi scores were not affected by the covariate of attitude toward technology integration.

For gender and PCU and CIP scores, the homogeneity of slopes test was not significant at the $p<.05$, $p=.084$ level for CIP scores and $p>.05$, $p=.917$ level for PCU scores. Therefore, since the homogeneity of slopes test was not significant, I completed the ANCOVA test focusing on gender and PCU, and CIP scores.

The simple main effects test was significant for gender and PCU scores: F (98, 103) = 12.057, $p<.05$, $p= .001$, $\eta^2= .108$. Means and standard deviations were as follows: for the men, $M=2.741$(SD =.254) and for the women $M=2.279$(SD =.228). The simple main effects test was significant for gender and CIP scores as well. The score for the ANCOVA test concluded that, F (98, 103) = 9.104, $p<.05$, $p = .003$, $\eta^2= .083$. Means and standard deviations were as follows: for the men, $M=3.46$(SD =1.601) and for the women $M=3.91$(SD =1.596).

Therefore, I accepted the hypotheses for both of these cases. These tests revealed that attitude is an important covariate when examining the relationship between gender

and PCU and CIP scores. Means for men were higher for PCU scores, and for women for CIP scores with attitude as the covariant.

Tenure and Attitude toward Technology Integration

The homogeneity of slopes test for tenure and LoTi scores was found to be not significant and was at the $p<.05$, $p = .922$ level. The simple main effects test was not significant for tenure and LoTi scores, while controlling for attitude. Means and standard deviations were as follows: for the tenured, $M=3.00$ ($SD =1.414$) and for the non-tenured, $M=2.15$ ($SD =1.117$). The test revealed that $F(98,103) = 3.241$, $p>.05$, $p = .075$ and the eta squared value, $\eta^2 = .017$. Therefore I rejected the hypothesis and accepted the null hypothesis.

For tenure and PCU and CIP scores, the homogeneity of slopes test was not significant at the $p<.05$, $p =.147$ level for CIP scores nor $p<.05$, $p =.794$ level for PCU scores. Therefore, since the homogeneity of slopes test was not significant, and I completed the ANCOVA test focusing on tenure and PCU, and CIP scores.

The simple main effects test was significant for tenure and PCU scores, while controlling for attitude indicated that $F(98, 103) = 10.175$, $p<.05$, $p = .002$, and the eta squared value, $\eta^2 = .094$. Means and standard deviations were as follows: for the tenured $M=2.79$ ($SD =2.121$) and for the non-tenured, $M=2.12$ ($SD =1.753$).

In addition, the simple main effects test was significant for tenure and CIP scores as well. The score for the ANCOVA test concluded that, $F(98, 103) = 9.516$, $p<.05$, $p = .003$, and the eta squared value, $\eta^2 = .089$. Means and standard deviations were as follows: for the tenured, $M=4.50$ ($SD =.707$) and for the non-tenured, $M=3.69$ ($SD =1.617$).

Thus, I accepted both hypotheses. These tests revealed that attitude is an important covariate when examining the relationship between tenure and PCU and CIP scores. Means were higher for the tenured group.

Conclusion

This chapter provided a detailed description of the research methods and methodology used for this study. I used a comprehensive literature review to guide the methodology section and attempt to answer the research questions. With regard to hypotheses 1, 2, and 3, I had to accept the null hypothesis for each. This meant that these demographic characteristics did not play a significant role in technology integration. However, for question 4, I accepted many aspects of the hypothesis. I therefore concluded that attitude is an important mediating variable for technology integration. This section included, but was not limited to, sample size, population, data collection methods, researcher design, human subjects, and data analysis.

The purpose of this study was to provide stakeholders in these midsized rural high schools with empirical evidence that integrating technology into classroom instruction is affected by age, gender, tenure, and attitude toward technology. The inferential statistical tests that I performed with SPSS indicated however that I could accept only my last hypothesis and then only partially. The data analysis showed that participant scores on LoTi, PCU and CIP were significantly below the midpoint for those scales. Age, gender, and tenure however, had only a very small and statistically insignificant effect on technology integration in classroom instruction. Finally, attitude was an important covariate in understanding integrating technology into classroom instruction. The results

suggest the need for professional development with regard to technology integration into instruction and also that creating a positive attitude should be an important aspect of that training.

Even though specific demographic characteristics (age, gender, and tenure) do not affect technology integration, the school district secondary education group, as a whole, is significantly below the midpoint of the scales for technology integration in classroom instruction and personal computer use. This indicates that this methodology could be suitable for further research.

The following section describes a technology based professional development project that has been designed to maintain and possibly increase the amount of technology that will be integrated into instruction, as well as increase the educators attitudes toward technology integration, among secondary educators in the aforementioned school district. The project design is based around the existing professional development meetings that are currently being used in the school district with the addition of a technology component that every teacher in the district must complete.

Section 3: The Project

Introduction

This doctoral study was designed to supply the research community with a solid base of understanding that age, gender, tenure status, and attitude toward technology affect the amount of technology that is used in classroom instruction. The overall results for the survey reveal that secondary educators in the rural school district are deficient in all three content domains of the LoTi survey. These include a mean score of 2.17 for LoTi, a mean score of 2.49 for PCU, and a mean score of 3.71 for CIP. The professional development program has been designed based upon the results of all the statistical tests that were completed, not just the descriptive statistics. Since the LoTi survey has already provided the researcher with the data that the educators in this school district, as a whole, are not routinely implementing technology into instruction and that attitude is one of the main factors for the non-integration of technology, I have chosen an "Educational Technology Needs Assessment" (Smith & Diggs, 2012) to obtain which skill level of technology use each teacher is capable of and comfortable with as well as identify which types of technology are causing the most difficulty while educators are trying to implement technology into instruction.

This 4-day professional development workshop has been designed to: (a) help all secondary educators in the school district understand how technology can be used in their classroom instruction, (b) instruct and demonstrate how to use technology in the classroom with the Common Core state standards, (c) provide direction and instruction

for the software that is being placed into classrooms for the upcoming school year, and (d) design Professional Learning Communities (PLCs) to help maintain technology skills for the design and implementation of technology-based lesson plans, while making communication more readily available among educators in the three high schools in the school district. The project and its implementation will affect every secondary educator in the three aforementioned high schools, as well as the superintendent, the supervisors, and the administrators in the school district.

Description and Goals

The professional development program that will be implemented has been designed to address the needs of teachers and improve their attitudes toward technology integration in instruction. The workshop series has been designed to alert the superintendent, supervisors, and administrators in the school district that technology implementation in classroom instruction is not occurring at acceptable levels, the level of personal computer use is low, and most educators are not using technology in their current instructional practices; even though the hardware, software, and instructional strategies have been provided.

The professional development workshop series will achieve the following goals: (a) improve the technological skills of all secondary educators, (b) increase technology use in the classroom, and (c) improve attitude toward technology. To reaffirm that technology use is not adequate in the school district, I will review the results of the survey with all stakeholders, and more importantly, the secondary educators. Technology implementation, in all aspects of society, is a must if educators want students to continue

to grow and supply the world with innovative ideas (Gabriel, Campbell, Wiebe, MacDonald, & McAuley, 2012). Therefore, educators need a professional development program that will help make a secondary educator's work more efficient and effective, as well as promote ideas, improve attitude toward technology in a positive direction, and increase technology use in classroom instruction.

The professional development program that will be implemented has been designed to address the needs of technologically deficient teachers and improve their attitudes toward technology integration in instruction. Each teacher will take the "Educational Technology Needs Assessment" (Diggs & Smith, 2012) survey to determine his or her level of comfort and skill relative to technology. The results of the survey will be compiled by the researcher and sent to each secondary educator, the four curriculum supervisors, and the superintendent of the school system. As described in Section 2 and the introduction to Section 3, all secondary education teachers who were surveyed, received a mean score between 2.17 and 3.17 on the content domains of the LoTi survey. Therefore, since the results suggested that secondary educators are deficient in technology skills, technology integration, and their attitude toward technology is predominantly negative, all secondary educators need to participate in some form of technology-based professional development training.

Professional development has often been viewed by outside sources (i.e. businesses, lawyers, etc.) as ineffective and as a negative aspect of education in America because it is often brief, usually occurring for one 8 hour day; does not occur often enough, usually occurring merely a few times throughout a school year; and it is without

follow-up or self- reflection sessions to solidify what was learned during the session (Potter & Rockinsaw-Szapkiw, 2012). To remediate the findings of Potter and Rockinsaw-Szapkiw and many other researchers, I have designed the professional development program to be four days in length and have multiple interactive sessions to learn about technology use in the classroom, technology and the Common Core, professional learning communities and their uses, and has invited a motivational speaker to encourage educators to work as diligently as possible with their students. The professional development technology-based workshop program is a two-part program that will be used by all of the secondary education institutions in the school district to help with technology needs and to improve attitude toward technology use in instruction. According to Lawless and Pellegrino (2007), professional development is one of the core components for influencing technology use among educators. In addition, Wozney, Venkatesh, and Abrami (2006) stated that personal experience, whether negative or positive in nature, is the single most important concept for adapting technology in the classroom.

The first part of the program will use three state mandated professional development days as the primary component to learn new technology integration skills for the Common Core State Standards, practice and prepare to use newer and established technology in instruction, improve attitude toward technology integration in the classroom, and maintain basic technology skills for instruction. The second part, or fourth day of the program, will be used for the design and use of PLCs within the three high schools in the school district.

Rationale

The intent of the technology professional development workshop program is to: (a) improve the attitudes and create positive motivation of resistant teachers towards learning and using new technology in classroom instruction, and (b) increase the technological skills of technologically deficient teachers by focusing on the specific software that is being used in the school district. Information from the program will allow administrators and supervisors to heterogeneously group technology-savvy educators with non-technologically-savvy educators into PLCs to increase technical knowledge.

This type of professional development project was chosen to address the need of technology integration deficiencies of secondary education teachers in the aforementioned school district because many of the professional development meetings in the school district lack a technology portion; and the only way to implement technology into schools, without teachers completing the task on their own, is with professional development meetings and professional learning communities. Research has suggested that the more time a teacher participates in professional development, the more they use and implement various types of technology in instruction (King, 2002). Caffarella (2010) stated that program objectives should be created carefully and should be practical of producing results and only designed for developing instructional practices. For that reason, producing an effective and efficient professional development platform with technology concentrated objectives should ultimately enhance technology implementation in classroom instruction throughout the school district.

Professional development in the aforementioned school district has a compulsory attendance mandate meaning that every educator in the school district must participate in four full days of professional development per year. The first professional development day occurs during the first day of school each year and then three equally spaced eight-hour professional development sessions occur during the year at the superintendent's discretion. Thus, to meet the state mandate and include all educators in the school district, the best way to reach all of the secondary educators, and be sure that they all participate, would be at these specific times.

During the district's normal professional development meetings, the content supervisor completes the standard procedures (class sizes, testing data review, attendance policy, etc.) and then in the afternoon the supervisor covers what policies or procedures he/she feels will be the main issues for the entire school year. These four, 8-hour days, would be a significant deviation from the school district's normal professional development meeting routine, and would allow new technology introductions and instruction for technology that is currently being used, provide the educators with technology integration sessions on appropriate and consistent use of technology in the classroom, allow an inspirational and motivational speaker to address the community, and rebuild communication within schools by the addition of the PLCs.

Review of the Literature

This chapter provides a review of the literature regarding the effects professional development have on integrating technology into secondary education instruction. Research on the topic of technology integration among secondary education teacher use

has been previously reviewed, reported upon, and studied by many researchers, as have the effects of professional development on technology use. Through a thorough investigation of references, sources, and frameworks, I have identified possible professional development resources that will increase technology integration in these three high schools. Examining the professional development practices in this school district will help identify possible causes that have limited technology integration in the local school district and even possibly nationally.

This literature review also gives information about the various factors that may impede secondary school educators from integrating technology into instruction in spite of professional development. The literature review, which was performed through the local library, discussions with local college professors, phone calls to college professors throughout the United States, the Walden library, Science Direct, Google Scholar, ERIC, Educational Research Complete, and ProQuest Dissertations and Thesis, provides a comprehensive overview of the effects that professional development results in throughout this school district. The key search terms for this project study include, but are not limited to, the following: *technology, professional development, technology professional development, team development, educational technology, computer-based professional development, and technology-based professional development*. Any information found via Google Scholar, was then researched in one of the aforementioned databases for validity and reliability. Peer reviewed journals, books, and articles provided most of the content for the research. In total, more than 25 peer reviewed journals, peer reviewed articles, and books were used to complete this project literature review.

Professional Development

Professional development is defined by the International Technology Education Association, or ITEA (2005), as "a continuous process of lifelong learning and growth that begins early in life, continues through the undergraduate, pre-service experience, and extends through the in-service years" (p. 2). Petrie and McGee (2012) posited that student achievement will continue to improve as long as the education industry uses professional development (PD) as the key mechanism to improve teaching. Brooks and Gibson (2012) stated that "professional development (PD) is essential to the teaching profession" (p. 2). Guskey (2000), as well as, Potter, and Rockinson-Szapkiw (2012) posited that the profession of being an educator has never before, in the history of education, demanded that professional development and technology-based professional development drive instruction. To concede, Fishman, Marx, Best, and Tal (2003) stated that the overall quality of teaching is directly linked to teacher interaction and participation in professional development activities. Opfer and Pedder (2011) theorized that if educators want students to obtain accolades for education, then professional development activities need to be increased in frequency and with clearly stated objectives.

Dana and Yendol-Hoppey (2008) concurred that directly linking professional development techniques and pedagogy to classroom instruction is a difficult task, especially since many educators have no support system in their work environment. Furthermore, Pedder and MacBeath (2008) identified school-wide systems of support for PD as a key mechanism that will help to foster effective PD. Cannon, Kitchel, Duncan, and Arnett (2011) stated that if an educational system is going to focus on what is

important to educators, knowing that the connection between PD and the classroom is often difficult, to improve teacher practice, professional development should be used effectively and efficiently throughout the entire school year. Hord (2004) stated that professional development should be transferred from the professional development meeting and into the actual buildings or employment places where the educators can access each other's ideas and collaborate on activities to promote student growth. Faulder (2011), agreeing with Hord, stated that professional development, to be utilized in the most effective manner, must promote, equip, prepare, and influence teachers to integrate information and communication technology (ICT) into classroom instructional practices. Brooks and Gibson (2012) related that in order for professional development to be successful, PD must be ongoing, intense, supported, modeled, and coached by administration and supervision, allow educators to input ideas, allow educators to question as to not feel powerless, enable educators to share their own work and students' work reflectively and collaboratively, as well as have a section designed for reflection.

The United States government is projected to spend 56 billion dollars for technology in education in 2012 and a large portion of that money will be spent on professional development activities with a focus on technology integration (Gaytan & McEwen, 2010). Seigel and Yates (2007) stated that "In a study of 5 urban districts, Miles, Odden, Fermanich, and Archibald (2004) found that the "amount of money spent on professional development ranged between two to more than five percent of total district expenditures, amounting to an average of more than $4,000 per teacher" (Lowden, 2005, para. 2), adding that professional development are costly and needs to be

designed, as well as implemented, consistently throughout an educational system. Therefore, if the process of professional development will be ongoing and consistent, and if money is going to be allocated for professional development, especially for technology integration, the professional development needs to be effective and efficient in order to improve instructional strategies and obtain quality student achievements (Gaytan and McEwen, 2010).

Importance of Technology in Professional Development

Teachers need more personal management of emerging technologies and technology-based professional development with a more detailed "demonstration type" approach to learning how to use new technologies (Bennison & Goos, 2010). Wang, Hung, Hsieh, Tsai, and Lin (2012) stated that the most productive professional learning takes place when technology is used as the medium for learning. The authors purported that technology, to be effective, must be demonstrated to the learner before the learner tries to implement the technology in instruction. Knowles, Holton, and Swanson (2011) explained that adults learn new information best if the information is presented in a real-life context. Bennison and Goos (2010) concluded that mathematics teachers who participated in technology-based professional development had stronger confidence towards technology use in instruction, and a more positive attitude toward technology use in the classroom, when compared to their counterparts. In addition to Bennison and Goo's research, Çakır and Yıldırım (2009) posited that computer education teachers feel that the more professional development teachers participate in, the more their attitude toward technology and technology integration changes from a negative to a positive. Abumaid's

(2011) findings concur with Cakir and Yildirim's and Bennison and Goo's findings, stating that consistent professional development sessions were increasing the information and communication technology skill level and knowledge of secondary educators.

Pan and Franklin (2011) revealed that one of the most important factors for educators to use and implement classroom technology is through professional development sessions and workshops. These authors also stated that in addition to professional development workshops, meetings, and activities, self-efficacy had a great impact on the amount of technology that is used in classroom instruction. Pan and Franklin research found a correlation between the amount of professional development an educator participates in and an increase of Web 2.0 tools. Pan and Franklin's (2011) research agreed with the previous findings from Albion (2001), Chen (2008), and Watson (2006).

Sanders (2009) indicated that teachers who were involved in technology- based professional development showed an increase in student achievement on standardized tests and produced a classroom climate that was more conducive to learning after professional development activities were completed. Blocher, Armfield, Sujo-Montes, Tucker, and Willis (2011) concluded that educators who spent more time on computer instruction, whether or not their technology skill sets were low or high, increased their technology skill set, and increase their students' technology skill sets as well. The results showed an average increase in educator mean technology rating from 1.84 to 2.09 and a mean student technology rating increase from .87 to 1.50.

Loveland (2012) concluded that professional development and professional development plans that contain technology integration as a focal point enrich student performance, are important in technology-based professional development, and technology-based professional development plans. Lowden found in her research that 52.7% of professional development activities revolve around technology integration in instruction. Killion (2013) also stated that as time progresses more school districts are turning to technology to increase more focused learning in educators and during professional learning situations. She stated that technology is best used when integrated into a comprehensive system of professional development. Thus, a technology portion of each professional development workshop or professional learning session should ultimately improve pedagogy and improve the use of technology in instruction (King, 2002). Killion (2013) posited that technology enhances professional learning through five critical attributes: personalization, collaboration, access, learning design, and efficiency. She posited that educators like and want to work together, as well as work alone, but, educators want and need to be as efficient and effective in their professional learning as they are in their instruction. Consequently, teacher knowledge improvement has been relevant in a study of the effect of action research on three areas: ideological, empirical, and technical (Ponte, Ax, Beijaard, & Wubbels, 2004). The authors concluded that in the areas that were studied, technical knowledge was the only area that improved.

Uslu and Bumen (2012) stated that technology-based professional development (PD) programs can help teachers incorporate information and communication technologies (ICTs) into classroom instruction. Technologies should be integrated to

motivate students, to enhance instruction, to make students and teachers work more productively, and to help students learn and sharpen their information age skills (Roblyer & Doering, 2010). Potter and Rockinson-Szapkiw (2012) concluded from their study that professional development cannot be a short one 8-hour day; PD must be intense and on-going to ensure that the technology that was learned in the PD session does not sit idle or rarely be used. In addition, Dunleavy, Dexter, and Heinecke (2007) posited that without on-going and appropriate technology-based PD, the use of computers and technology in the classroom will cease to exist. Uslu and Bumen (2012) found that teachers who held a positive attitude toward ICT, as well as toward professional development, had an increase in student use of ICT in classroom practices and increased their use of ICT in instruction after professional development was implemented. The increase in ICT use in the classroom increased by a mean difference of .32 with an effect size of .58 (which is stated as a medium effect size) with F(1=55)=18.59. A negative attitude toward information and communication technology (ICT) use was not changed after the professional development implementation. Usla and Bumen affirmed that "the PD program increased technology integration of teachers, and this increment was retained for six weeks, but technology integration did not increase after the six weeks." (p.122). Thus, the authors stated that PD needed to occur repeatedly after the six weeks in order for technology use to maintain at the current level of increase.

Kopcha (2012) found that if professional development is not directly linked to classroom instruction practices, then it actually becomes a barrier to instructional practices. Kopcha stated that professional development needs to be tailor made to the

specific instructor in order for a change to occur; if not, it will become a barrier to the instructor's teaching. For example, an art instructor does not need professional development on how to design a web page. That would be better suited for a computer science teacher, thus, possibly creating a negative attitude toward professional development.

Professional Learning Communities

According to Bullough (2007), a PLC is a network of teachers that gather together during a specific time frame (i.e. once a week, twice a month, four times a year, etc.) to discuss new teaching techniques and strategies, manipulate data, discuss curriculum topics and state mandates, or anything new that has been acquired through trainer-led professional development workshops. Professional learning communities are a more suitable platform for adult learning because the interaction with colleagues is more personal than with professional trainers.

PLCs are an additional form of professional development to trainer-led professional development workshops, and should be considered a unique from of professional development that will improve interaction among participating teachers (Dana & Yendol-Hoppey, 2008). DuFour (2004), who is often noted as a PLC expert, says that professional learning communities should focus on learning rather than teaching, as well as work collaboratively on matters that are only relevant to learning, and all of the educators who are involved in the PLC should hold themselves accountable for the kind of results that are produced.

A PLC should be designed by a knowledgeable group of administrators who will base the PLC on the needs of the members in the group with the main goal of achieving a common planning/preparation time (Hord & Hirsh, 2009). Borko, Jacobs, and Koellner (2010) argued that an essential component of high-quality professional development is the participation. Educators must actively and collaboratively participate in the activities and strategies in order to obtain and utilize the strategies and activities in classroom instruction. Hord and Hirsh's (2009) research results disclosed that most educators desire a common planning time that is strategically planned by the administration during the workday. The authors stated that this is the most productive structure for learning communities. Walker (2013) adds that teachers are spending less time collaborating with other teachers that reside in the same building than in previous years because of the amount of changes that are taking place in education due to the Common Core and PARCC assessments.

Hord (1997) stated that PLCs are a great strategy for aiding school staff with curriculum selection and adaptation, creating a unique building block toward professional development improvement, and are a great tool for creating a necessary change in a school. Potter and Rockinson-Szapkiw (2012) posited that PLCs help increase technology use in classroom instruction by sharing best practices among members and increase self-efficacy by increasing self-confidence among members. Overbaugh and Lu (2008) concluded that technology integration in instruction increases in situations where there is collaboration among PLC members.

Cifuentes, Maxwell, and Bulu (2011) researched how technology can be integrated into the classroom through the use of a professional learning community. Their research encompassed three rural high school districts that lasted for a two-year period. A total of 50 participants were included in the study. The participants included 35 teachers, 9 administrators, 3 technology specialists, 2 university faculty members, and 1 graduate student in educational technology. At the end of the second year, the mean score on the data collection instrument had risen to 4.67, starting at the beginning of the research with a diagnostic test mean of 3.44, and then rising again at the end of the third year to 4.78. Cifuentes et al. used a Tukey *t*-test to analyze the scores of the instrument and found that the scores were within the .05 confidence interval. In conclusion, the authors stated that teachers felt more comfortable using technology in their instruction after the inception of the PLC and "Teachers' technology adoption scores did increase considerably from the beginning of the project to the end of each year, and overall, the STAR professional development program had a positive effect on teachers' self-reported technology adoption" (p.71).

Motivation to Learn and Positive Attitude

Wlodkowski (2008) stated that the responsibility to learn, for adults, is an inescapable fact because adults are held more responsible for their actions than children. He posited that enhancing the meaning of learning activities for adults can be achieved by making activities unpredictable, varied, and containing a meaningful challenge. Accordingly, he continued that if educators incorporate these aspects into instruction, adult learners are more motivated, have a better attitude toward learning, are not bored,

and are more alert and focused. Finally, Wlodkowski (2008) stated that if instructors demand learners to pay attention and stay engaged, it actually increases their willingness to cooperate and learn. Knowles, Holton, and Swanson (2011), concurred with Wlodkowski (2008), positing that adults are motivated to learn if they hold the belief they can learn the new material, the learning will help alleviate a problem, and is an important aspect of their lives.

Knowles (1989) stated two assumptions that add to our understanding of adult motivation to learn: "(a) Adults have a self-concept of being responsible for their own decisions, for their own lives. Once they have arrived at that self-concept, they develop a deep psychological need to be seen and treated by others as being capable of self-direction", and (b) " adults become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations" (pp. 83-84).
All learners are responsible for their own learning and their own willingness to learn new material; how we learn stems from our motivation to learn (Merriam, Caffarella, & Baumgartner, 2007). Merriam et al. stated that "The need to make sense out of one's life experiences is often an incentive for engaging in a learning activity in the first place." (p. 424)

One's attitude toward any learning objective is a crucial part of the learning process and defines how an adult will learn and investigate a new topic or task (Mager, 1968). Usla and Bumen (2011) posited that successful implementation of educational technologies depends largely on the attitude of the educator and their attitude toward the specific technology. Long (1983) stated that "all adult learners have experienced some

learning and all adults have some experience that may be related to learning" (p. 223). This concept should allow adult learners to transfer learning from one educational place to the next. Galbraith (2004) further stressed the idea that the adult learner has an increased awareness of themselves and can develop new insight and utilize experiences that will impact future learning. If educators can learn new technologies in their professional development sessions, the information should be transferrable to the classroom.

Çakır and Yıldırım (2009), as well as Hew and Brush (2007), posited that negative attitudes of teachers are the main barriers for the integration of technology in education The limited knowledge of teachers about technology and technology integration also yield a negative attitude toward technology, as well as, the profession of teaching. Kahveci, Sahim, and Genc's (2011) research concluded that educators, if offered incentives towards buying technology to use for instruction, often maintain a more positive outlook toward technology use in instruction. Liu and Szabo (2009) also posited that educators will continue to have a positive outlook on technology use, if incentives for attending professional development are included. These include payment, laptops, and release time from employment duties. Maneger and Holden (2009) posited that perceptions about technology and attitudes toward using technology are two of the key components for technology integration in classroom instruction. Palak and Walls (2009) indicated that teacher attitude toward teacher software use, student software use, and selections of instructional practices were major predictors of technology use in instruction. Palak and Walls found that teacher software use ($t = 4.96$, $p<.01$), student

software use ($t = 2096$, $p<.01$), and selection of instructional strategies ($t = 3.61$, $p<.01$) were all statistically significant. Palak and Walls indicated that decisions that will affect technology use in instruction rely upon their attitudes toward technology. Palak and Walls indicated that attitude is the top reason for and against integrating technology in the classroom. Other studies have been completed to analyze the effects of attitude toward technology integration. Studies by Atkins and Vasu, (2000), Gbomita, (1997), Moore and Benbasat (1991), Roblyer and Knezek (2003), and Sugar, Crawley, and Fine (2004) pinpoint that attitude is a significant, if not the most significant factor, for technology usage and integration in classroom instruction. My results also have provided the research community with another set of data that concludes attitude is a significant factor, if not the most significant factor, for technology use and integration.

Implementation

The curriculum supervisors in the school district tend to choose other teachers to present new technology to the school system. Ponte, Ax, Beijaard, and Wubbels, (2004) stated that as educators use professional knowledge and interact with each other, the more insight and exploitation of successful ideas and instruction strategies are formulated, and subsequently then used in instruction. The authors stated that once this pattern of interaction and knowledge has been created and used multiple times, the learning cycle then repeats itself consistently.

In the school district, many teachers are trained in content specific areas and are sometimes more knowledgeable about technology within their content area than an outside source. For example, I have been selected numerous times throughout my career

to attend technology workshops and then return to his home school to disseminate the information or present it in a professional development meeting. In the school district in question, it is more cost effective and logical to have a teacher trained in current technology for two reasons: (a) The school district Board of Education only has to pay four teachers per school to be trained instead of paying a consulting firm or professional technology company to present the desired information, and (b) The teachers who are trained are embedded throughout the school system and reside in the schools or buildings. The availability of a trainer helps supply the school system with on-site help when requested.

Potential Resources and Existing Supports

One of the greatest resource and support systems that exists in the school district is a technologically competent administrative team. Both the superintendent and all of the subject matter supervisors are technology oriented professionals, who believe that the key to each student's future is to use and to explore technology.

The resources that are used to complete the school district's technology professional development workshops are imbedded in the board of education's budget with the exception of the breakfast provided, and if needed, a consulting trainer. In the event that a consulting trainer is needed for a specified type of software or hardware, additional funds will be required. Other than this additional cost, all costs are already in the board of education's budget. These trainings take place during school hours, inside school buildings, and all employees of the board of education are salaried employees.

Potential Barriers

One of the major obstacles I will face will be the general lack of technology use and knowledge, and negative or resistant attitudes of secondary educators in the school district. M. J. O'Rourke (personal communication, May 25, 2013), who is a veteran, tenured, educator who rarely uses technology in the classroom, stated that a student can still get a quality public education without technology, but in order for the students of today's generation to remain associated with the ever changing ways of today's higher educational system, it would be best to add technology into instruction. I will have to find various ways to entice and accommodate unwilling educators.

Funding for the equipment needed for classroom instruction will be another possible barrier. The county faced this deficiency in 2011 when specific mathematics teachers wanted to purchase SMARTBoards. J. Blank (personal communication, 2013) stated that funding had to be shifted through various departments and then grants had to be applied for to ensure that all mathematics educators received a SMARTBoard. Although funding is not a major issue in the county at this time because of declining enrollment in student population, it will probably become an issue as more budget cuts in education increase through the next decade.

Finally, the issue of educator accountability is always an issue in education. The public usually wants to know and have some example of proof that students are learning while they attend a secondary education facility. Finding a way to evaluate educators fairly and have the educators accountable for student learning is never easy.

Proposal for Implementation and Timetable

The technology professional development workshops will be held sequentially during the school year. The first workshop will take place during the first professional development day mandated by the state. After the initial workshop, the state mandates three professional days thereafter. These are called 190th days. These days will be used to implement the new technology and design PLCs within the three high schools.

The 190th days are designed by the school superintendent and the local board of education members, but they are usually held in this order with little variation: One designated time slot each in November and February with the final workshop/meeting held on the second to last day of school in June. After a few years of successful implementation of these professional development sessions, I will urge the superintendent to add four more mandatory professional development sessions to each school year.

Roles and Responsibilities of Adult Learners

Adult learners, especially those who educate young adults on a daily basis, must realize that the world is changing and the needs of these young adults are not the same as they were 15 to 20 years ago (Prensky, 2001a). Prensky stated that "digital natives" possibly learn differently, due to an exposure of digital media, and may have modified their brain structure and processing abilities. Many secondary education classrooms have changed from paper, textbook, and pencil classrooms, into technology-oriented classrooms that become more technologically oriented every day (Hedburg, 2011). Many

classrooms, however, continue to keep the traditional method of instruction, with no change in the foreseeable future (Caldwell, 2005; Pasco and Adcock, 2011).

Research has shown that professional development must contain a portion or segment that is interactive and engaging for participants in order for learning to occur (Wang, Hung, Hsieh, Tsai, and Lin, 2012; Knowles, Holton, and Swanson, 2011). Consequently, I have designed the professional development sessions to be active, and engaging, as well as motivating. The design of the PD sessions will be compromised of four eight-hour sessions. During each PD session, at least 4 hours have been allotted for trainer/participant interaction using various technology-based activities. All activities include technology that has been installed or will be installed for educators to use in the upcoming school year. The technology trainer will use the technology and each educator will follow along in order to learn all procedures that are associated with the new technology. The technology that will be used for the PD workshop series will be the Interactive SMARTboard, and the ASPEN Portal.

Project Evaluation

Every program, presentation, or lecture that is used for teaching or instructional purposes must be evaluated. Summak, Sammancioglu, and Baglibel (2010) stated that the evaluation of technology and how it is used in education is necessary for stakeholders, policy-makers, and administrators. Lincoln (1982) stated that an evaluation can be based on how much something is worth or what value it possesses. Galbraith (2004) stated that when using a proper evaluation tool, the teacher and learner communicate better, learn better and at a better pace, while also moving toward the future. Galbraith (2004) also

posited that any method of teaching would be rendered useless if a decent monitoring process was not included. He reiterated that adult education instructors must give critical feedback and supply encouragement and guidance to participants of programs (Galbraith, 2004, pg. 376).

The goals of the professional development workshop series are to: (a) alert the stakeholders (superintendent of the school system, curriculum supervisors, and administration) of the technological deficiencies that educators in the school district possess, (b) improve the technological skills of all secondary educators, (c) increase technology use in the classroom, and (d) improve attitude toward technology. The evaluation for the professional development project will be a goals-based evaluation. The goals-based evaluation was chosen me because it will allow me to collect, synthesize, and process the given information for a reason that is authentic and useful for the entire school district. The goals for the project will be evaluated formatively by using a small qualitative survey, classroom observations, and random sample interviews of the secondary education population in the school district. Knowles, Holton, and Swanson (2011) declared that evaluations should be diagnostic in nature and be used to improve learning. Due to legality issues, the curriculum supervisors and school administrators will conduct the observations and interviews. The evaluation process for this professional development project is not like a "one-time" survey. The educator evaluations must be completed on a continuum for multiple years to ensure that technology is being used correctly and consciously in the classroom. As educators in the school district increase their technological skills and improve their attitude toward technology integration

throughout multiple consecutive school years, the formative evaluations will become routine and foster more discussions of what needs to be added or deleted from the school district.

At the beginning of the first technology professional development, the curriculum supervisor and I will distribute the survey entitled "Educational Technology Needs Assessment" (See Appendix A). The survey will be completed and returned to the curriculum supervisor and me. The survey is designed to identify potential problem areas in the use of technology in classroom instruction and evaluate opinions and skill levels of all secondary level educators in the school district. In addition, randomly selected participants will take part in a five minute interview with me two weeks after the professional development workshop has been completed, and other educators will be subjected to observations by the content area supervisor to monitor and indicate if any changes have occurred. These methods will be used to identify problematic areas, areas of concern, and areas of strength. The survey, observations, and interviews must be completed to identify the problematic areas so the administration can assign PLCs that will identify and alleviate any potential issues in the future.

The researcher, superintendent, curriculum supervisors, and administration will use the survey to address the following: (a) Will your teaching style include technology as a result of the professional development workshops? and (b) Have your questions and overarching concerns about new technology been addressed through the professional development workshops? The survey is designed to allow teachers the opportunity to answer questions about their own teaching style and identify current technological

problems that they are having in their classrooms. This will aid in the construction of the PLCs.

The observations will be completed one to two weeks after each technological professional development workshop has occurred. All participants will be randomly selected, omitting the first round of participants, and have the opportunity to decline the observation if they decide not to participate. The observations will take place in the interviewee's home school or home building. Each observation should not last any longer than 30 minutes. The observation will be completed at the interviewee's discretion and by the content subject supervisor using the observation checklist as shown in Table 6.

Table 6

Observation Checklist

Question	Yes	No
1. Does the educator have any types of technology in his/her classroom?		
2. Does the educator use the technology they have been provided? How long during one instructional period does he/she use the provided technology: _____ minutes.		
3. Do students use any technology during instruction? How often and for how long do they use technology during one class period:_____times, _____ minutes		
4. If multiple visits are made, does the educator consistent use technology during classroom instruction?		

5. Does it appear that the professional development workshop series is helping the educator use technology in instruction?

Supervisor Comments:

The observations have been designed so the supervisors can discuss and solve problems that have been associated with the new technology or integrating the technology into instruction. The observation results will be finalized and collated into hard copies.

Every researcher has a set of defined questions that must be answered to ensure that their research is valid and reliable (Kelley, Clark, Brown, and Sitzia, 2003). These questions are the building blocks to research. The guiding questions for the interview evaluations are as follows:

1. Have your technological skills improved since the beginning of the professional development workshop series?
2. Since the inception of the PD workshop series, has the amount of technology you use in your current instructional practices increased or decreased? Explain.
3. Has your resistance to technology and your attitude towards technology changed since the culmination of the professional development workshops?

I will set up a meeting with all administrators and curriculum supervisors to discuss the results. Once the results have been discussed, I will finalize a proposal of change and set up a meeting with the superintendent of schools to discuss possible solutions.

Implications Including Social Change

Local Community

This project addresses educators' needs by addressing technology skill deficiencies and helps to improve attitudes toward technology integration by educating staff members about the importance of their participation in developing technologies, life-long learning, and future student success. By educating staff members about new and upcoming technological advancements in the field of education and attitude toward technology use in classroom instruction, and the addition of the PLC project, educators should continue to improve their abilities to use technology and maintain on-going progress. The project's results might motivate all secondary educators in this school district, as well as nationally, to increase their participation levels in technology integration.

According to Hechanova and Cementina-Ol Pac (2012), people are at the forefront of change in the academic and business world; only through personal effort and defined goals will the changes ever be implemented. Also, Siegel and Smoley (1989) stated, ‘‘leaders from both worlds (business and academia) confront the same fundamental issues, namely: rethinking mission, doing more with less, and doing things

better'' (p. 6). Before change can occur within the local community, change has to occur at the root of the problem; the educators.

The professional development project should help address the problem within the school system and the addition of the PLCs throughout the district should aid in the forward progression as well. After a full year of professional development implementation and PLC exposure, the school district will have emphasized the importance of technology implementation in classroom instruction. Thus, social change will occur in the following ways: (a) students will benefit and should improve expectations for future employment opportunities and education, (b) students' technology skills should improve, (c) the community should benefit from the students' adaptations to new and emergent technologies and therefore should be willing to hire students directly from high school without any apprehension, and (d) it (technology) should reduce the financial burdens that potentially unemployed high school graduates have on the local community and economic configuration of the U.S.

Far-Reaching

The professional development model that I have designed is simple, just as many designs are simple. The accountability of the employed educators is more important than any other aspect of the job, and educators need to realize that the future of the world is basically in their hands. In the larger context, the findings of this study indicate what many other researchers have already discovered: educators need more technology integration training and a more positive attitude toward technology in the classroom. Technological information must be shared and taught to the upcoming generations in

every state and every country to ensure that we become more productive and inventive than ever before.

Finally, my project offers the local board of education, as well as any other education system throughout the U.S. recommendations on how to become more technologically oriented and develop relationships through PLCs that will increase a positive attitude. Although my project is small in comparison to other projects that have been completed in this country, as well as globally by researchers like Durndell, Haag, and Laithwaite (2000), Albirini (2004), Almas and Krumsvik (2007), and Abumaid (2011), the result and conclusions definitely show that educators need to constantly evaluate and re-evaluate their technology skills, improve in proficiency, use, and collaborative efforts. This project may stimulate other researchers to investigate these recommendations, ultimately providing the research base with more conclusions and results about technology integration and demographics of secondary education educators.

Conclusion

Throughout section 3 of this study, I have discussed the goals, rationale, and evaluation that are addressed to the superintendent of the school system, as well as content supervisors, administrators, and most importantly, all secondary level educators. The literature review provided a detailed review of the current trends and ideas that exist within research about professional development, PLCs, and motivation and attitude toward learning. The next chapter will discuss my project strengths, weaknesses, and areas that need remediation and/or improvement

Section 4: Reflections and Conclusions

Introduction

The purpose of this doctoral study was to investigate the effects of age, gender, tenure and attitude toward technology on technology integration in classroom instruction. The findings of the study revealed that all educators in the school district are performing at a mean level of approximately 2.8 out of a possible 7 in their LOTI, PCU, and CIP domains. A technology-based professional development plan was developed from this project study. The technology-based professional development plan for workshops and meetings is my recommendation to the local BOE. This plan was designed to increase and maintain the technological skills of the faculty and aid in their implementation of technology into classroom instruction. In addition, the project will remove barriers that prohibit educators from using technology in everyday applications. For the remainder of this section, I will (a) discuss the projects' strengths, weaknesses, and limitations, (b) reflect on my role as a leader, a scholar, and a project developer, and (c) develop my recommendations for action and further study.

Project Strengths

Identifying that this NorthEastern school district has educators who are inadequately prepared to integrate technology as a learning tool led to a methodical, effective plan of action. The 21st century technology skills that are established by the Common Core standards have made teaching with technology a responsibility that should be shared by all educators. One of the positive outcomes of my research is that, by using a survey to collect data, I determined that many educators, if not all educators in the

school district need technology-based professional development to enhance student learning and embrace the technology skills needed for the 21st century.

This study had two main strengths: the survey measured technology use and skills needed for the 21st century, and it surveyed a diverse population of secondary level educators. The LoTi survey, designed by Moersch (LoTi, 2011), measured the levels of technology implementation of a large population (*N*=103) on the three domain constructs: LoTi, PCU, and CIP. The survey has been tested by numerous doctoral level educators and has been proven throughout the last 20 years to be effective in providing researchers with accurate and verifiable results. According to Laird and Kuh (2005), global employers as well as local employers have urged educational systems and local educational systems to increase student technological skills, which are demanded by the technological advancements of the digital age. This has significantly increased expectations for student learning. I felt my study was needed to inform the local board of education about the current levels of technological integration in classroom instruction.

The final strength of this study was that the study used a population that is economically, ethnically diverse. The ethnicity is slightly varied with approximately 92% white teachers, 6% African American teachers, and 2% Asian teachers. According to S. Lewis (personal communication, September 7, 2013), the population in the area is not extremely diverse; however, it is more diverse now than it has been during the last 60 years of the school system's existence. The geographic area that I live in is broad, with educators living in four different states, all within 45 miles of the local school system. Each state has different economic standards, thus creating an economically diverse

population. The region is split into farmland and business districts, thus creating a thriving economy and a diverse population of students and educators.

Recommendations for Remediation of Limitations

A limitation of this project is that administering the survey online affected results because of technical difficulties, and therefore affected the results of the study. The LoTi Company had an extensive log-in procedure that was a deterrent for participants who were willing to participate in the survey. Several participants contacted me about the problem after my last email was sent asking secondary educators to complete my survey. Even though I tried to guide the participants through the steps to log in via phone, email, and instant messaging, a few participants still decided not to participate.

Another limitation that I did not recognize when I designed my study was that the educators who have difficulty with technology would not be able to access the survey online. Some educators, who are already deficient in their technological ability, could not or would not log into the survey to take it. This could have been because of a negative attitude toward technology, their age and not using technology in their undergraduate work, or simply a personal frustration due to prior negative experiences with technology.

LoTi, the survey company I used for my doctoral study, does not offer a paper and pencil version of their survey. This was unforeseen when I designed the study and was definitely a key drawback to the results. Even though I did have a good response rate, I feel I would have obtained at least an 85% response rate if a paper and pencil test had been available in addition to the online survey. Porter (2004) posited that paper-and-pencil surveys are more time consuming and more costly, whereas electronic surveys are

quick and relatively inexpensive; I can, however, attest that my survey was expensive ($1000) but less time consuming than paper and pencil. I would not have invested $1000 in survey packets, but I would have been more involved with participants if the study was completed with paper and pencil. However, I would have had to administer the test by myself, which would have been an anonymity issue. I wanted my study to be completely anonymous so that no educators could be singled out during data analysis. In addition, the online survey was effortless for me to analyze data because it was easy to export the data to SPSS from LoTi.

Another limitation was the survey design. The design of the survey was multiple choice and short answer. I could have acquired more insight on the participants' views and opinions of technology integration in classroom instruction by allowing open-ended questions.

The last limitation of the study was that participants decided not to take part in the survey. There were a few teachers who retired before my survey began and a few who started the survey and never finished the survey. According to A. Stewart (personal communication, June 15, 2013), many teachers did not participate in my study for various reasons: (a) the survey was too difficult to access online, (b) a few participates declined to participate because they felt the study lacked credibility and (c) the timing of the survey was at the end of the school year. The school year was extended due to Hurricane Sandy and multiple winter storms which caused school to be cancelled. In the state in which the survey was completed, there is a mandatory 180 day school year. As a result,

teachers had already been given extra paperwork to complete in order to be ready to leave for summer. Therefore, many of the educators did not complete the survey.

The first remediation for these timing limitations would be to administer the survey before educators are ready to leave the building for summer. Once the students have left the school for the year, teachers are packing up classrooms and getting ready to leave for the school year as well. The participation rate might have increased had the survey would have been administered earlier in the school year.

The second suggested remediation recommendation would be to administer the survey by paper and pencil method and input the results into SPSS by hand. I feel the survey rate would have been increased and the results of the study would have depicted a better result than my statistical analysis. According to Porter (2004), survey participants are more inclined to participate in paper and pencil surveys than online surveys. This recommendation would have alleviated many of the limitations of my study.

The data revealed that there is an overall need for educators to use more technology in classroom instruction. The mean, median, and mode for each LoTi sub-scale were below average. The results of the survey indicated that attitude was a significant factor in determining whether or not technology would be used in classroom instruction. I recommend that during the school year each educator be evaluated by the administration on technology skills, as well as use of technology in the classroom, and the administration should survey random educators about their attitudes toward technology. If an educator cannot prove that technological skills are competent enough to be used in classroom instruction or with the technology that has been provided by the

school district, then the administration needs to design a mandatory professional development workshop to address the needs of the struggling educators. Accordingly, the International Society of Technical Education posited that the constant evaluation of an educator's technology skills will ultimately increase student performance (ISTE, 2008). Fishman, Marx, Best, and Tal (2003) posited that the overall quality of teaching is linked to teacher interaction and participation in professional development activities and programs. According to the authors, the more technology based professional development an educator participates in, the more likely the student will achieve higher results in classroom knowledge.

To remediate the survey design flaw, I feel that a mixed method study design using quantitative, as well as qualitative data, would provide a better understanding of an educator's perspective and insight about technology use in the classroom and how to improve his or her technology abilities. Using open-ended questions and a structured interview of purposive sample participants would have allowed me to gain a better understanding of what prohibits or inhibits the use of technology and why attitude toward technology is a determining factor whether or not secondary educators use technology in instruction.

Scholarship

The journey that this HEAL program of study has taken me through during the last three years has proven to me that I can do anything that I put my mind to. The challenges I have faced with the writing expectations, as well as the quantitative data analysis, have turned me into a better scholar. I teach mathematics, but I only obtained an

undergraduate degree in mathematics, so learning some of the more advanced statistical tests like ANCOVA, as well as learning how to work with SPSS was definitely one of the most rewarding parts of the entire study. During my undergraduate work for my mathematics degree and my M.Ed. in curriculum and instruction, I never had to survey a large population of people. The surveys I completed for those degrees had at most 25 people in the population. Thus, this made completing the survey for the study a great opportunity for me to discuss new statistical strategies and learn different types of mathematics that I did not study in my undergraduate studies.

During the permission phase of this project, I had to obtain permission from the human resources department and the superintendent of the school district in order to complete the study in my school district. The agreement for the approval of the study was that I had to share all the findings with a panel of supervisors, the human resources department, and the superintendent of the school district. Simply knowing that my project will be evaluated by the superintendent of the school district has made me focus more and prepare what I feel is a project that will change the school district.

This doctoral journey has been extremely rewarding because I acquired many important skills and proficiencies that I did not have before the journey began. The literature review for the project improved my research skills considerably. Also, this journey has been rewarding for me because I learned how to cite and use the APA manual. I have used this specific skill more than any of the other skills I have learned because I teach senior level and college level students and many of their projects entail a

reference page as well as a short research paper. The APA manual has helped me inform my students how to correctly cite and use the manual to aid in the writing process.

This doctoral study has also influenced my thought process in one specific way: I have become a critical questioner in my job as an educator. I have found that throughout the last three years of my teaching career, this doctoral study has helped me to develop better questioning skills and a more concentrated question skill set than before. I am constantly asking myself, "Are these the best questions I can ask in my instruction? Did I ask enough questions so the topic is clear and concise? Is the information I am using exact, precise, and up-to-date?" Before my education started at Walden University, I did not reflect on my question skills and pedagogy.

Finally, I have changed the thought process in my personal life to focus on what is important. I have come to the conclusion that my family is the single most important aspect of my life and is the only support system I trust. Although, I always placed duty for my wife and kids as a monetary priority, before this journey began, I would substitute coaching, hunting, fishing, and my music career in place of camping, shopping, and family outings. This study, as it has changed my habits and lifestyle, has put the whole concept of family back into perspective. The journey has changed my focus and thought process to include my wife, my wife's education, my parents, my siblings, and most importantly, my children and their education.

Project Development and Evaluation

The primary belief of my project is to design a technology-based professional development workshop series that will provide a better understanding of the technology

that exists for educators in this school district to use in instruction and to continue the trend of life-long learning based upon technology use in classroom instruction. Through the constant absorption of scholarly resources and existing literature that are related to technology in education, I designed a project that would result in an authentic application of knowledge acquired through various resources. This project design will provide the school district with a systematic professional development plan that will increase technology skills and encourage educators to strive for a positive attitude toward technology use in instruction. The development of this project resulted from the findings of the survey that was completed by the secondary education faculty in the school district.

In order to design a professional development project, however, you need to have defined a problem. Throughout my career, I have not had the opportunity to work in various places of employment and I therefore have not experienced the technological issues that I have experienced in this school district. I based my project upon the deficiencies I have witnessed throughout the last fourteen years.

Throughout the development of this project, I learned that you have to review the literature on the topic you want to investigate to create a program that can have a lasting effect on your district. I have learned how important it is to do a needs assessment on the participants involved, as well as the topic involved, and select an instrument that is valid and reliable. Another important aspect of project development is collecting quality data and analyzing the data as efficiently as possible without personal bias. As with all well established research, I learned that the results of the data need to be used to design a

project that will be data driven and respond to the needs of the stakeholders and local community.

A variety of methods for evaluating doctoral study projects exist. These forms include but are not limited to: surveys, interviews, and observations. According to Bustos and Arostegui (2012), an evaluation of a program will allow me to collect information for value quality, to find what is attainable and what is not, to determine what the inadequacies of the program are, and to eventually aide in the decision making about personnel choices. In this case, I feel the best evaluation piece will be when the four-day workshop sessions are completed, and I can observe educators in my school district to see if the workshops have: (a) helped secondary educators in the school district understand how technology can be used in their classroom instruction,(b) instructed and demonstrated how to use technology in the classroom with the Common Core state standards, (c) provided direction and instruction for the software that is being placed into classrooms for the upcoming school year, and (d) aided in the design of district wide PLCs to help maintain technology skills for the design and implementation of technology-based lesson plans, while making communication more readily available among educators in the three high schools in the school district.

Leadership and Change

Throughout my high school and college careers, I accepted various leadership positions. The positions I accepted during my high school career were the captain of my high school football team and captain of the basketball team. During my college career, I was a member and one of the student leaders of the Kappa Mu Epsilon math fraternity at

my college and one of the lead developmental math teachers for the university undergraduate math program. Throughout this eight-year time span, I acquired leadership skills that have allowed me to be an effective educator and coach, as well as a self driven life-long learner. Ever since I signed my first contract for the local school district thirteen years ago, I have maintained a personal leadership role in the school where I have been employed. My principal relies on my mathematical abilities to complete the school improvement plan (SIP) and the school transition plan. I am considered the cochair for the SIP and transition plans. For my first 5 years as a teacher, I was the lead designer for the school's webpage, and for the last two years, the school's math instructional specialist , as well as, an instructional leader. Even though none of these positions are authoritative positions in nature, in order to become the SIP, transition plan leader, and instructional math specialist, one must be approved and deemed a leader by the administration. According to Curtis and Aspen (2013), school systems should provide their highest-performing teachers with leadership roles that both elevate the profession and enable them to have the greatest impact on colleagues and students. I feel that since I started my education at Walden University, I have put the leadership position on "hold" and focused on completing my degree while becoming a better scholar, researcher, and critical thinker. I think I needed that change in my mental structure because I was so used to being the teacher, team leader, and decision maker, that I forgot how to be the student that I once was. The change in roles has definitely helped me focus on my doctoral study and has ultimately helped me focus on my goal of obtaining my Ed.D. After the completion of my Ed.D, I hope that this course of study will help me be a better leader in

my school, and enable me to use this degree to become a superintendent of a school system somewhere in the United States of America and increase student achievements, awards, and accolades through the use of technology in the classroom.

Analysis of Self as Scholar

The most important thing I have learned throughout this doctoral degree process is that patience is a virtue. I started this degree as one of the more impatient students and narrow-minded people. I always wanted my papers written from my point of view, my assignments completed more quickly, and my classes to end earlier. As I proceeded from the first year to the second year, then the second year to the third year, I slowly learned that not everything in this world is completed on my terms. Never in my life had I been exposed to this type of scholarship. I had always written my papers in my own opinion. Now, everything that I wanted to say or write in my study had to be proven as valid and reliable through a scholarly source. I would now have to wait 10 days to get a score for my work. And finally, my classes were three weeks longer than any of my college classes. As a result, I do not feel the same way now, as I complete this journey, as I did when I started on it three years ago. It's no longer about completing specific tasks, but having a broader perspective on reaching important goals.

One of the major obstacles of my educational career over the past 12 years has been my inability and unwillingness, to read educational articles and educational research journals. I majored in mathematics in my undergraduate education. I was always a non-reader during my first degree. I always felt that if it the reading selection did not contain mathematical equations and formulas; it would lack immediate application in my studies.

I would read just enough to get through my sociology, psychology and English classes which usually resulted in lower grades than in my math classes. As I began these doctoral level classes; however, I began to understand that reading is just as important, if not more important, than all the math formulae, equations, and trigonometric identities that I had previously learned and used in my every day instruction. This type of scholarship and research demanded that I use and apply the knowledge that I acquired in my previous courses essentially to my doctoral study. Through constant reading, evaluation of my study by my chair, cochair and URR; as well as exposure to new statistical procedures that I was not accustomed to, I became aware that there is no one correct solution to any given educational problem. Rohn said in 1930, as cited by Windrich (2012), "You are only as good as the average of the 5 people you spend the most time with" (p.1). This is not only true in life; but, this is true of my doctoral journey. My professors, and more importantly, my committee chair, cochair, URR reviewer, and IRB reviewers have pushed me, encouraged me, and enlightened me to be the best researcher and practitioner I can be. Without these educators, I would have resorted to the old adult learner and educator I once was which is nowhere near the learner or educator I have become.

In addition to understanding that patience is a virtue, I feel the doctoral degree process has not only helped me become a life-long learner and educational advocate for other instructors in my school district, I feel it has helped my marriage, my health, my home life, and how I approach my profession. Having deadlines to meet, papers to write, and multiple articles and books to read all changed that method of thinking, and ultimately has restored my health and well-being, my religious beliefs, and my devotion

toward the students in my school district. Thanks to Walden University, and more specifically, this doctoral study, I constantly re-evaluate my goals so I can become a better educator, leader, and scholar.

Analysis of Self as Practitioner

As an educator at the high school level, as well as the collegiate level, I have always strived to make students, young and old, aware of their surroundings, both educationally and in their normal lives. I am referring to the ever changing world of technology. I strive to produce students who are as technologically fluent as they possibly can be because of the direction in which our world is growing. My goal as an instructor is to maximize and maintain the use of technology in my classroom lectures so other educators and students will do the same in their educational endeavors.

As a school improvement plan developer for my school, as well as a curriculum plan designer, I choose on a yearly basis, which material and subject choices allow teachers to achieve a balance of technology in instruction that will be productive and improve test results as well as create instructional lessons that are appropriate for the students in my district. As a practitioner, I designed a research project addressing technology integration in classroom instruction. As the technology leader for my school, I designed this project to deliver information about technology uses, how to use it in the classroom, and how to use the information among each other in a professional learning community. The goal of the project is to ultimately increase the technology skills of secondary educators and inform the educators that technology integration in the classroom is an ever-present project; a project that needs the cooperation and

collaboration of all secondary educators in order to improve student performance and achievements. Using best practices and the professional development platform that our county has in place, I will continue to develop these skills further, whether or not I continue teaching at the secondary level, become a curriculum supervisor, or move upward to a position of administration or supervision.

Analysis of Self as Project Developer

One of the main skills that I acquired throughout the development of this project is better research skills and solid professional communication skills. As I gained better research skills, I was able to pick and choose the type of professional development platform that would create the best learning atmosphere. Dissecting the books and articles by authors like Wlodoski (2008); Spaulding, and Voetgle (2010); and Gabriel, Campbell, Wiebe, MacDonald, and McAuley (2012), allowed me to apply their ideas and adapt them to fit my situation. Communication with the local board of education supervisors and human resource department was crucial in gaining access to the board of education's technology acceptable use policy as well as maintaining a professional relationship with the secondary educators who were going to be taking my survey. The communication portion of the study was probably one of the most beneficial pieces because I had to interact with people with whom I may have had prior conflicts and by maintaining a professional attitude and demeanor, providing me the opportunity to increase my communication skills.

The moment I was granted permission to collect data for my doctoral study is a moment I will remember for a long time. I was so excited I actually called my wife to tell

her the news. I was so eager to collect the data so I could design the project that I had to leave work early. I think it was because I wanted to contact my survey company and send out the survey. Although I had intended for 70% of my colleagues to participate in the survey, the timing of the survey could not have been worse. By the time the survey was posted online, the school district only had a few days of school left and the attitude and willingness of my colleagues to participate in my study was not as I had hoped. However, an important lesson was learned from this portion of my study. I learned that participants are unpredictable in their willingness and choices, and sometimes unwilling to do more work than their negotiated contract states. As a result, I learned that the time frame I developed for the survey was not indicative of a good project developer. However, Maxwell (2002) stated "A man must be big enough to admit his mistakes, smart enough to profit from them, and strong enough to correct them" (pg. 1).

The Project's Potential Impact on Social Change

The goal of this quantitative study was to determine if age, gender, tenure, and attitude toward technology affected technology integration in classroom instruction and possibly identify barriers that exist and hinder the integration of technology into instruction. Throughout the literature review, I found that age, gender, tenure, and attitude toward technology affect the use and amount of technology that is used in classroom instruction. Ertmer (2005) stated that if we are going to demand that educators achieve fundamental changes in classroom instruction, then researchers need to examine teachers themselves and the beliefs they hold about teaching, learning, and technology.

The project that I developed has the potential to change the way the local board of education approaches professional development meetings and workshops, and the use of PLCs. To date, no other educator in my school district has completed a study based upon technology deficiencies among secondary level educators. Therefore, there is a possible gap in practice and pedagogy in terms of technology use in instruction, in this school district. Thus, I attempted to aid other researchers in attempting to prove that demographics affect technology integration in classroom instruction in this school district.

Implications, Applications, and Directions for Future Research

This study on the effects that demographic characteristics and attitude toward technology have on technology integration in classroom instruction did not completely support my initial hypothesis that demographic characteristics affect technology integration. This needs to be interpreted however, in the larger context of a generally low integration of technology into instruction.

This study will provide the research community with a solid foundation of knowledge in respect to demographics and technology integration in classroom instruction and attitude toward technology use. The study has the following implications on future research: (a) the overall results show that all educators are deficient in using technology in instruction, and (b) attitude of secondary educators is a genuine predictor of technology use in instruction. Hopefully the research community will eventually use my project as a resource and guide to further research that is based, not just on a local school district, but throughout the U.S. and globally.

The primary goal of the project is to help improve the technological skills of secondary educators and improve their attitude toward technology use in the classroom. Life-long educators should consider using effective professional development, whether it is online or in-person, to improve their deficiencies. A collaborative effort from future researchers that use my professional development workshop sessions may increase the desired technology skills and promote a more positive attitude toward technology integration. It is not enough for secondary educators to increase their knowledge and technology skill set, educators must also use the knowledge and skills so students obtain 21st century technology skills and apply them to their education.

Several factors play a role in adult learning. Dewey's (1938) and Knowles' (1984; 1994) theories of adult learning focus on learner's experiences, self-initiated learning, and prior knowledge. As a result of self-initiated learning, the educator has a greater opportunity to discover more avenues of technology integration. Kotrlik and Redmann (2002; 2004; 2005; 2009), have stated that an educator's age is one of the most important factors that affect technology integration in classroom instruction. Mims-Word (2012) found that gender played an important role in technology use and McNeese, Hartsell, McGarity, & Harper (2003) posited that females have a better attitude toward technology implementation. Kinnamon (1990) posited that teachers with tenure need to become familiar and practice with technology because computer technology was not part of their pre-service training. According to Lawton and Gerschner (1982), teacher attitudes and technology usage are closely correlated. These findings, which conflict with my results, demonstrate the need for another technology-based study to be conducted to ascertain if

more specific demographics and attitude toward technology affect technology implementation. More studies need to be conducted with just age and technology integration, gender and technology integration, tenure and technology integration, and/or attitude toward technology and technology integration as the focus.

Conclusion

The literature review and the study results do not convey the same results as other researchers. The technological survey I conducted in the small Northeastern school district examined the demographic characteristics of 103 secondary education teachers and the affects that demographic characteristics and attitude toward technology have upon their willingness and ability to integrate technology into classroom instruction. The technology based professional development workshop and meeting plan will, ideally, communicate to the district superintendent, the local BOE, the supervisors, and staff members the study's conclusions and potentially help technologically deficient educators overcome the barriers, whether personal or mentally, associated with technology use in classroom instruction. As an educator, I hope that my research will motivate staff members to continue to use technology in classroom instruction, re-invent instructional lessons that will add in a technology component, and persuade students to use technology to increase their test scores, research skills, and overall academic performance.

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Appendix A: Professional Development Project

Professional Development Workshop Plan and Training
ABC School District

A Quantitative Study that Determines the Affects of Demographics upon Technology Integration

Brian Michael McKinley

October 2013

Table of Contents

Professional Development Plan

Professional Development Plan

Project

- A professional development plan with training sessions be used to improve the technology skills, attitudes of educators towards technology, and design PLC's to help improve technology integration into classroom instruction.

Background

- Adoption of the Common Core State Standards and Race to the Top Standards as well as maintaining the top AP scores in the United States Educational system. All educators in this district have a responsibility to stay technological enept and up-to-date with all new technological advancements in education.

- A non-experimental one-time survey design was used to ascertain what teachers need in order to improve their capabilities with technology and technology implementation.

- The findings of the research indicated that teachers were slightly below the ”Infusion" stage of the LoTi standards which are based on NETS.

Purpose

- The professional development plan is a small plan for addressing a larger need to improve teacher’s technology skills, attitude toward technology integration in instruction, and PLC design and implementation. Thus, the scope of the plan is

designed for all secondary level educators, at the high school level, in the aforementioned school district.

Target Audience

All secondary educators at the three high schools within the school district

Goal

The goal of the project is to improve the technology skills and attitudes of all secondary level teachers in the ABC school district in order to improve technology integration skills by creating an effective professional development plan with training sessions that will meet teachers' needs as adult learners.

Learning Objective

At the conclusion of the training session, all secondary education teachers will learn how to use all of the technology applications (i.e. SMARTboard applications, DVD's, TABLETS, SKYPE, etc.) that have been purchased for the school district

At the conclusion of the training session, all secondary education teachers will know their technology skill level and will also know how to improve the level through using technology in their classroom.

At the conclusion of the training session, all secondary education teachers will be able to adapt at least one technological aspect to the Common Core Standards.

At the conclusion of the training session, all secondary education teachers will be introduced to a PLC within their school and start to collaborate technology based ideas for the upcoming school year.

At the conclusion of the training session, all secondary education teachers will improve capacity for using information and technology ethically, responsibly.

Proposal for Implementation and Timetable

The technology professional development workshops will be held sequentially during the school year. The first workshop will take place during the first professional development day mandated by the state. This occurs the first Wednesday of the third week of August every year. After the initial workshop, the state mandates three professional days thereafter. These are called "190th" days. These days will be used to implement the new technology professional development plan and design PLC's with the help of the administration within the three high schools. The 190th days are designed by the school superintendent and the local board of education members, but usually are held in this order with little variation: One designated time slot in November (The first Wednesday of the month), one designated time slot in February (the third Tuesday of the month) and the final workshop/meeting held on the second to last day of school in June (This is weather dependent, as it always changes from year to year due to snow days or weather related make-up days).

Once the first technology workshop has taken place, the next two "190th" days will take place without content supervisors, but within the three local high schools and

the supervisors will be the three high school principals. The goal of the second and third professional development meetings will be to place the correct amount of highly skilled and motivated teachers with un-skilled or less motivated teachers. The principals in these three buildings know the capabilities of each teacher and who works well with each other, as well as, who is willing and knowledgeable about technology use in instruction. These professional development days for the school year will be used to further investigate new technology, remove any problems or questions about the technology that is currently in place in the school district by using in small co-operative learning groups with a trained technology teacher, and to design cohesive PLC's for the upcoming school year.

A tentative schedule of the four technology based professional development meeting will be as follows:

Schedule for 1st PD Day -August

(Held with content area supervisors)

7:30 a.m. – 8:00 a.m.:

Breakfast (doughnuts and coffee)

8:00 a.m – 8:30 a.m.

Supervisor or content specific administrators will already have designed groups and locations for each content to meet.

Pre-designed groups will meet in specified computer labs at the given location– Complete "Educational Technology Needs Assessment"-Focus on specific areas of concern (i.e SMARTboard, TABLETS, DVD's, Technology Implementation skills, Applets, etc.)

8:30 a.m. - 9:00 a.m:

Introductions of guest speakers, new hires, and supervisor led discussion about changes in the Common Core Standards and Technology Implementation (Depending on new and emerging technology, these topics should change from year to year)

9:00 a.m – 10:30 a.m:

Technology Implementation for the Common Core– Hands on/Teacher/Trainer Led.

Watch and discuss the videos:

1. "Vision of the Common Core" (SchoolImprovement.net, 2011)
2. "Why we need the Common Core: I choose C?" (Gutierrez, R., 2012)
3. "Common Core Standards Example Math Lesson" (KidsTeachnLearn, 2011)

Educators will be separated into four member cooperative learning groups to answer the following questions:

**Key Questions that must be answered by each educator:

1. What will the Common Core do for our county? Country? Globally?

2. Is the Common Core necessary? If so, why?

3. Name what subject matter disciplines the Common Core Encompasses.

10:30 a.m. - 10:45 a.m.: BREAK

10:45 a.m – 12 p.m:

Technology use within the Common Core – Video presentation then Teacher/Trainer Led Discussion

Watch the videos:

1. "What's the 411: Teachers, Technology and the Common Core" (DiscoveryEducation.com, 2012)

2. "Technology and the Common Core Standards" (Atomiclearning.com, 2012)

12:00 p.m – 1:00 p.m:

Lunch (On your own) - Supervisor will suggest that educators discuss the Common Core during their lunch period

1:00 p.m – 2:00 p.m:

Regroup and have a Trainer led session about Technology Integration within the Common Core in the classroom

Activity: Pro's and Con's of Technology in the classroom with Venn Diagram

Common Core questions that should be discussed educators providing the led and the trainer only supplementing corrections:

1. How much and how often should technology be used in classroom instruction?
2. Should we, as teachers, allow students to use technology in the classroom (i.e. tablets, Ipads, Iphones, Smart phones, laptops, etc.)
3. What should we, as educators, do if we do not know the correct way to implement technology into a Common Core lesson.
4. Read and watch the attached video in the article “"How Teachers are Integrating Technology into the Common Core." (Sitkins, 2013)

2:00 p.m. - 3:00 p.m.:

Assign Groups of 4 Educators (Cooperative Learning - Skill level is irrelevant at this point in time) to design a Technology Based Common Core Lesson or a just a regular technology-based lesson plan.

*Before separating into the assigned groups, the supervisor will show an example of a common core lesson plan that has technology embedded throughout the lesson (See Materials # 7)

**Group Lesson Plan design that revolves around the Common Core and using technology in classroom instruction. The Lesson plan must be completed by the end of the session to receive PD credit

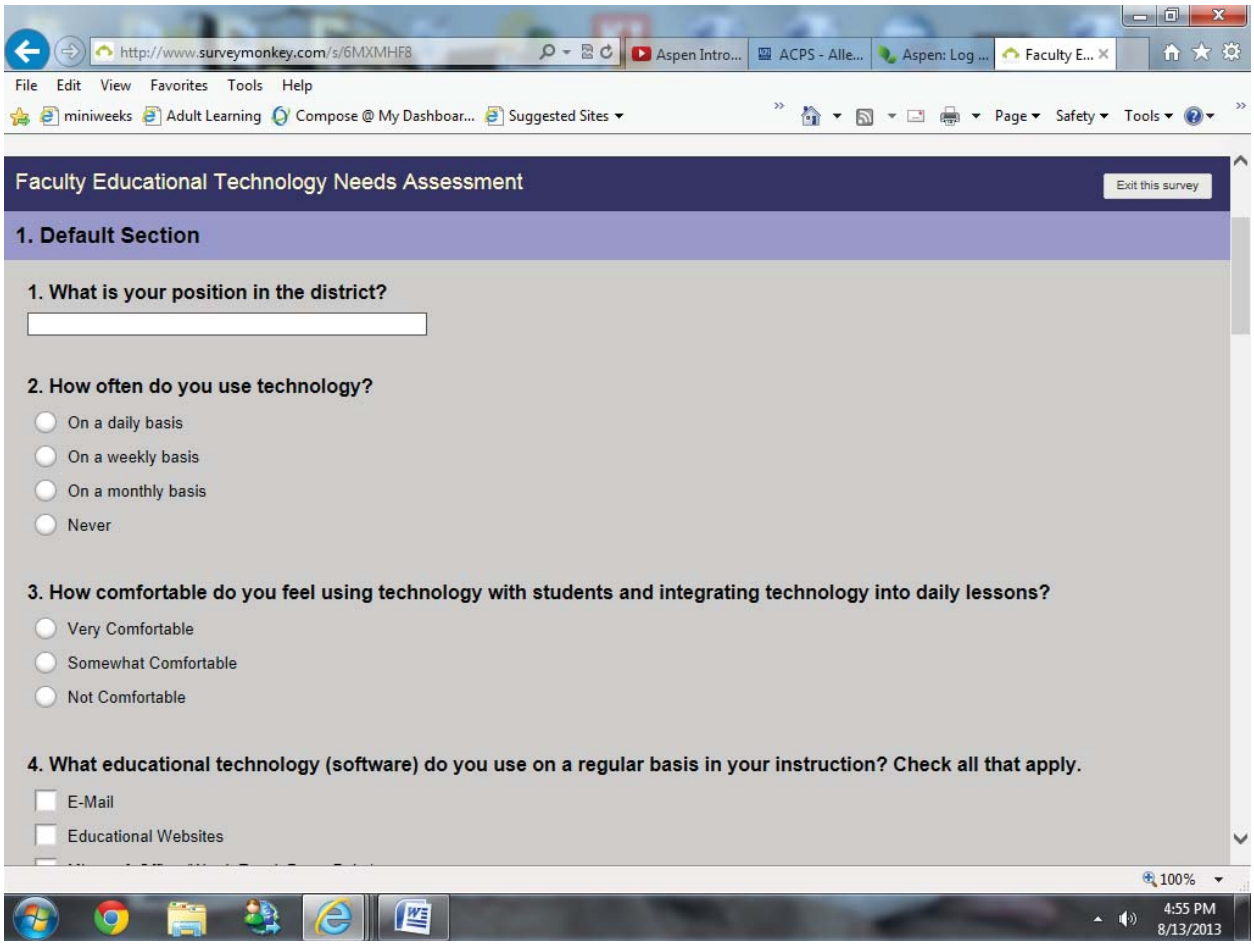
3:00 p.m. - 3:30 p.m.:

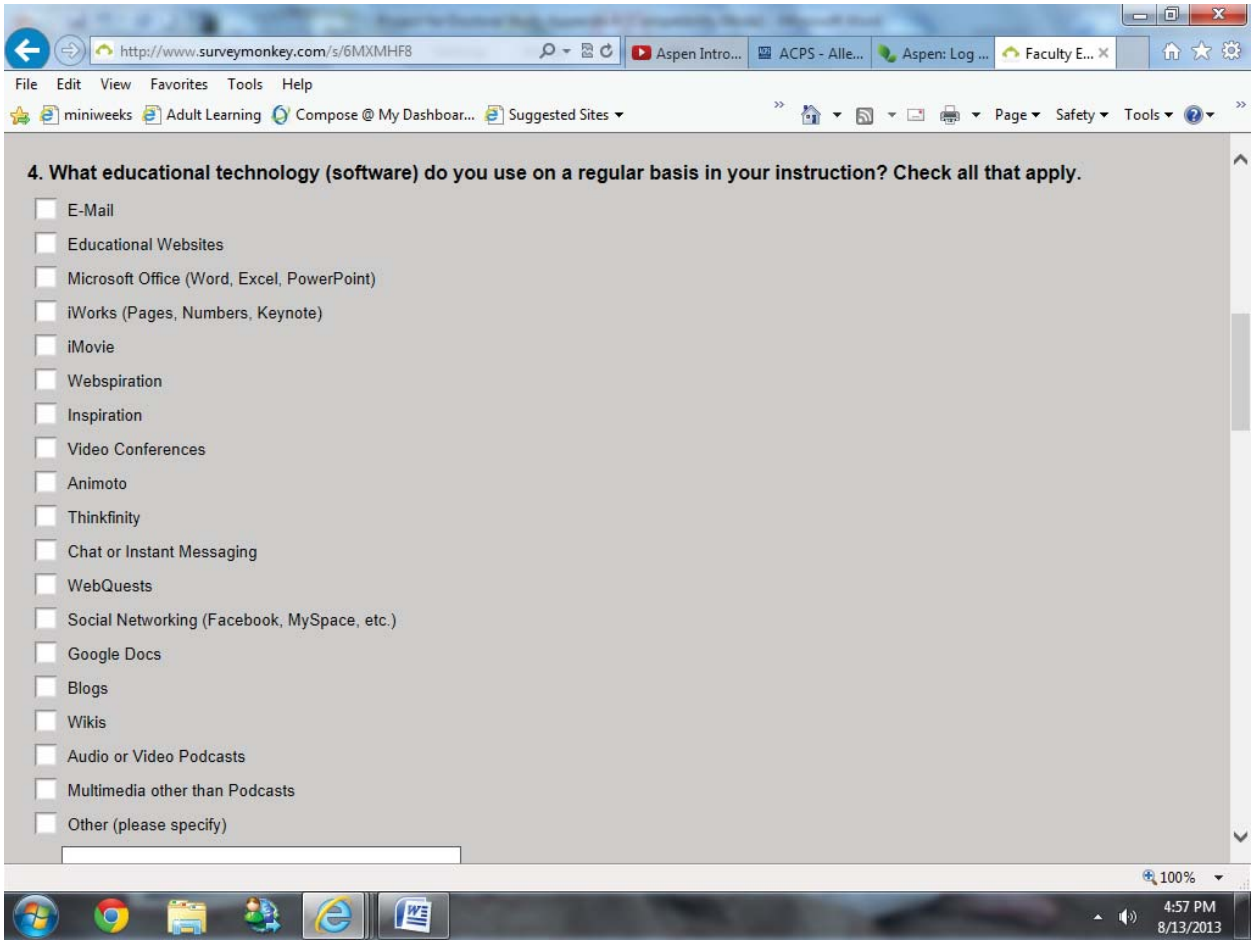
Reflection of Lesson Plans and Technology use in the classroom and Question-Answer session/closing remarks

MATERIALS FOR DAY ONE

1. SMARTBoard, LCD projector, screen, sound system, wireless Internet access, laptop or desktop computers for the trainer's and all participants
2. "Educational Technology Needs Assessment Survey" (surveymonkey.com, 2012) http://www.surveymonkey.com/s/6MXMHF8
2. "Common Core Standards Example Math Lesson" (KidsTeachnLearn, 2011) http://www.youtube.com/watch?v=ZFdeCkjwACQ
3. "Technology and the Common Core Standards" (Atomiclearning.com, 2012) http://www.youtube.com/watch?v=G6Hrih582Lg
4. "Vision of the Common Core" (SchoolImprovement.net, 2011) http://www.youtube.com/watch?v=PbagTYYCXYU
5. "What's the 411: Teachers, Technology and the Common Core" (discoverylearning.com) - http://www.youtube.com/watch?v=WUqYZANK9l0
6. "Why we need the Common Core. I choose C?" (Gutierrez, R., 2012) - http://www.youtube.com/watch?v=dY2mRM4i6tY
7. "How Teachers are Integrating Technology into the Common Core." (Sitkins, 2013) http://www.edudemic.com/2013/04/integrating-technology-into-the-common-core/
8. Researcher's Technology-Based Trigonometry Common Core Lesson Plan (McKinley, 2013) retrieved July 21, 2013 from (http://stemplans.allconet.org/plans/manage.cfm?planID=0E79556C-EB94-6469-B60DFB3766845703)

Example of the first page of the Educational Technology Needs Assessment Survey (Surveymonkey.com)




http://www.surveymonkey.com/s/6MXMHF8
Aspen Intro...
ACPS - Alle...
Aspen: Log ...
Faculty E...
File Edit View Favorites Tools Help
miniweeks
Adult Learning
Compose @ My Dashboar...
Suggested Sites
Page
Safety
Tools
4. What educational technology (software) do you use on a regular basis in your instruction? Check all that apply.
E-Mail
Educational Websites
Microsoft Office (Word, Excel, PowerPoint)
iWorks (Pages, Numbers, Keynote)
iMovie
Webspiration
Inspiration
Video Conferences
Animoto
Thinkfinity
Chat or Instant Messaging
WebQuests
Social Networking (Facebook, MySpace, etc.)
Google Docs
Blogs
Wikis
Audio or Video Podcasts
Multimedia other than Podcasts
Other (please specify)
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Schedule Day Two - November

(Held with content area supervisor and superintendent in the afternoon)

7:30 a.m. – 8:00 a.m.:

Breakfast (doughnuts and coffee)

8:00 a.m – 8:30 a.m:

Introductions of speakers and trainers, old business, and new technology introduction (This will change year to year depending on software purchased by the BOE)

8:30 a.m – 10:45 a.m:

SMARTBoard and ASPEN Technology Implementation – Hands on/Teacher or Professional Led (This technology will change year to year depending on software purchased by the BOE-For the upcoming school year, SMARTBoard and ASPEN will be used because of user errors and problems with technology implementation in classroom instruction)

The trainer will start with a video entitled "SMARTboard Training with Russell Taylor." (AdamSmithCollege, 2011). Since all classrooms are equipped with SMARTboards, the trainer will show and guide educators through the steps as the video is running. The trainer will do more in-depth illustrations of embedded SMARTboard techniques and how to use the special features of the technology when the video session is completed. Finally, the ASPEN program and all of its features will be pre-viewed in their entirety. The trainer will show a quick video entitled "ASPEN Introduction to the Family Portal" and then show in-depth illustrations and instructions on how to use and integrate the program into your teaching and class management.

10:45 a.m. - 11 a.m. - BREAK

11:00 a.m.– 11:30 a.m:

The trainer will assign different cooperative learning groups and the educators will discuss the advantages, and disadvantages that are shared by the new technology. Each group will use the compare and contrast Common Core model (abcteach.com, 2012) to highlight the advantages and disadvantages of the technology (See material listings)

11:30 a.m – 1:00 p.m:

Lunch(On your own)-The trainer will encourage educators to discuss the software during their time away from the session)

1:00 p.m – 3:00 p.m:

Introduction of the Superintendent of the local school district.

The superintendent will lead a discussion of advantages and disadvantages of SMARTboard and ASPEN. He/she will put all ideas out there for discussion so that he/she will know what the skill level of each educator is and how they feel about technology integration in classroom instruction.

3:00 p.m. – 3:30 p.m.

Self Evaluation Paragraph- How do you think you did in your exploration of the software and is the software possible to use in your classroom?

MATERIALS FOR DAY TWO

1. SMARTBoard, LCD projector, screen, sound system, wireless Internet access, laptop or desktop computers for the trainer's and all participants
2. SMARTboard with Russell Taylor (AdamSmithCollege, 2011) "http://www.youtube.com/watch?v=kcRJW-arn48."
3. "ASPEN: Introduction to the Family Portal" (Nealellis, 2012) http://www.youtube.com/watch?v=32yHMboqIMY
4. Common Core Example (abcteach.com, 2012) (http://static.abcteach.com/content_preview/c/cc_compare_and_contrast_middle_2a_p.png)

Schedule Day Three -February

(Morning with content area specialist and afternoon at home school with your administration)

7:30 a.m. – 8:00 a.m.:

Breakfast (doughnuts and coffee)

8:00 a.m – 10:30 a.m:

New technology review from first day and Introduction of the SMARTboard TABLET and the IPAD as an interactive device for the SMARTboard

All Participants will read the article titled: "Why Tablets Will Kill Smart Boards In Classrooms" (Fowlkes, 2013) and complete a compare and contrast table that will compare the SMARTboard and the Tablet. Then complete the "Narrowing Down a Subtopic Example."

9:30 a.m – 10:30 a.m:

Independent Software Exploration of TABLET (one tablet per person will be available)

Each educator should design a K-W-L list (Ogle, 1986) (See material list for day three)

10:30 a.m – 11:30 a.m:

Regroup, then assign groups of four members to each Collaborative learning groups will explore the software highlighting at least 3 major weaknesses or strengths of the software

11:30 a.m – 1:00 p.m:

Lunch (On your own) and then travel to home school

1:00 p.m – 3:00 p.m:

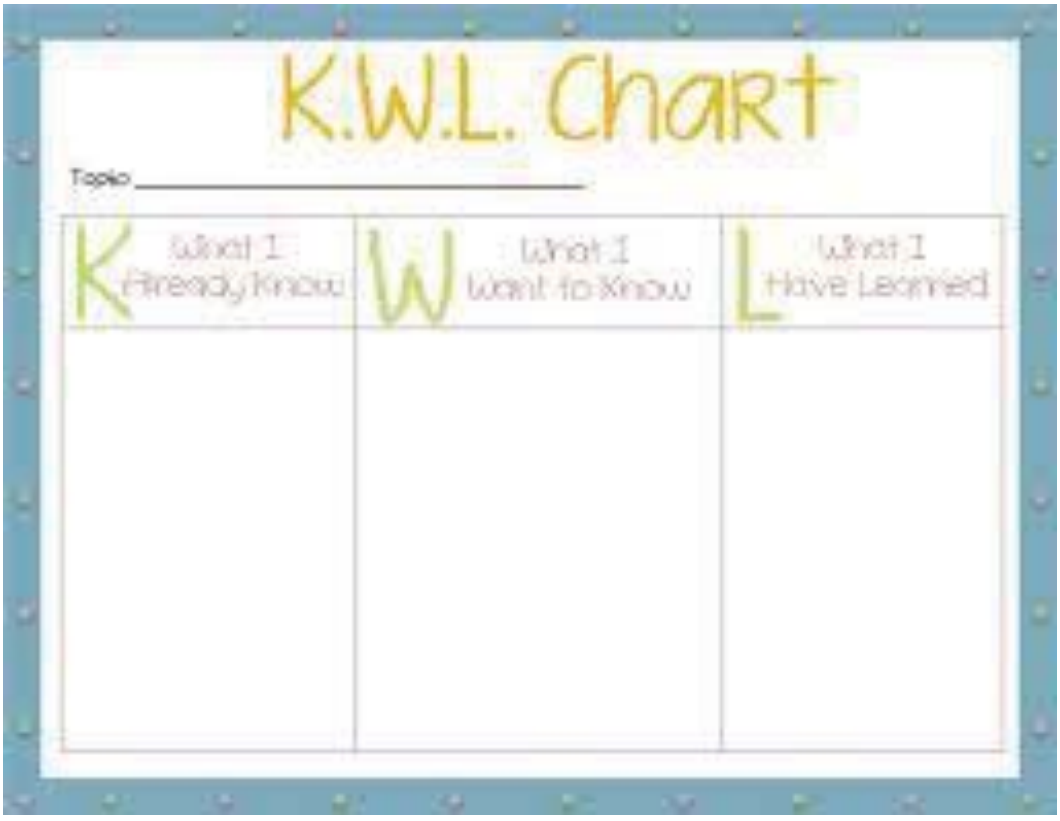
Introduction of PLC's and how the administration designed the PLC's using the "Educational Technology Needs Assessment" survey results (Skill based: Each group will be given at least one - 4 level skill person from each discipline and one 1-level skill person from each discipline)

3:00 p.m. – 3:30 p.m.

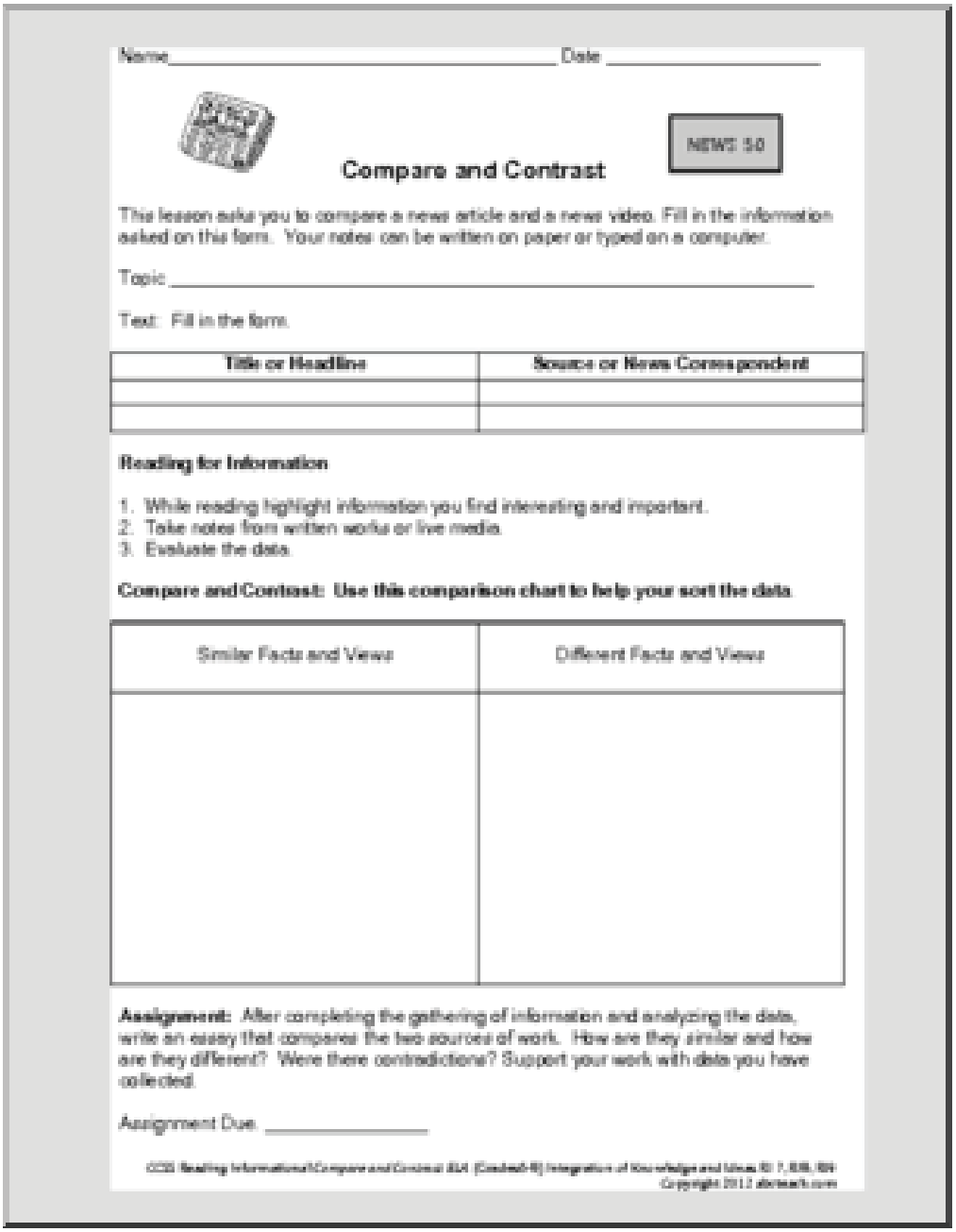
Assemble PLC's start and collaboration efforts. The administration will show the video "How to connect and IPAD to a SMARTboard" (ehowtech.com, 2012). After the video, each group will be given one IPad and will be instructed to work together to connect the IPad to the Smartboard and record their results for a later discussion. This is a team building/ member compatibility check, as well as, a technology skill exercise.

MATERIALS FOR DAY THREE

1. SMARTboard tablets and Laptop or Desktop Computer (One Per Person)
2. "Why Tablets Will Kill Smart Boards In Classrooms" (Fowlkes, 2013) http://www.informationweek.com/education/mobility/why-tablets-will-kill-smart-boards-in- cl/240145886
3. "How to connect and IPAD to a SMARTboard" (ehowtech.com, 2012) http://www.youtube.com/watch?v=_0Rzn_9Eem0
4. K.W.L Chart (Ogle, 1986) (Example Below)



Compare and Contrast Example:



Name_____ Date _____

NEWS 5.0

Compare and Contrast

This lesson asks you to compare a news article and a news video. Fill in the information asked on this form. Your notes can be written on paper or typed on a computer.

Topic _____

Text: Fill in the form.

Title or Headline	Source or News Correspondent

Reading for Information

1. While reading highlight information you find interesting and important.
2. Take notes from written works or live media.
3. Evaluate the data.

Compare and Contrast: Use this comparison chart to help your sort the data.

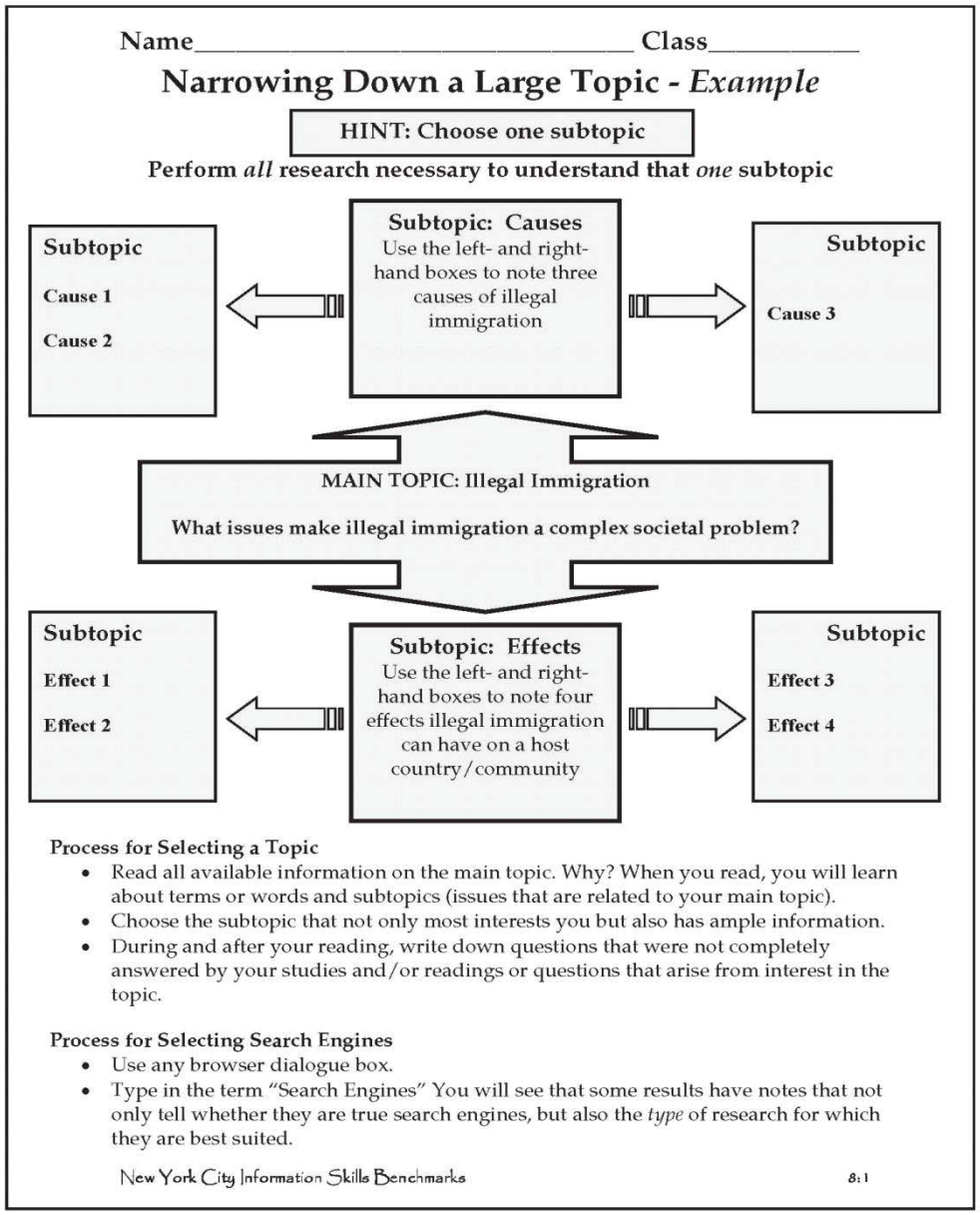
Similar Facts and Views	Different Facts and Views

Assignment: After completing the gathering of information and analyzing the data, write an essay that compares the two sources of work. How are they similar and how are they different? Were there contradictions? Support your work with data you have collected.

Assignment Due: _____

CCSS Reading Informational/Compare and Contrast ELA [illegible] Integration of Knowledge and Ideas RI 7, RI8, RI9

Narrowing Down a Subtopic example:



Name_____ Class_____

Narrowing Down a Large Topic - *Example*

HINT: Choose one subtopic

Perform *all* research necessary to understand that *one* subtopic

Subtopic
Cause 1
Cause 2

Subtopic: Causes
Use the left- and right-hand boxes to note three causes of illegal immigration

Subtopic
Cause 3

MAIN TOPIC: Illegal Immigration

What issues make illegal immigration a complex societal problem?

Subtopic
Effect 1
Effect 2

Subtopic: Effects
Use the left- and right-hand boxes to note four effects illegal immigration can have on a host country/community

Subtopic
Effect 3
Effect 4

Process for Selecting a Topic

- Read all available information on the main topic. Why? When you read, you will learn about terms or words and subtopics (issues that are related to your main topic).
- Choose the subtopic that not only most interests you but also has ample information.
- During and after your reading, write down questions that were not completely answered by your studies and/or readings or questions that arise from interest in the topic.

Process for Selecting Search Engines

- Use any browser dialogue box.
- Type in the term "Search Engines" You will see that some results have notes that not only tell whether they are true search engines, but also the *type* of research for which they are best suited.

New York City Information Skills Benchmarks 8:1

Schedule Day Four - June

(At home school with Administration):

7:30 a.m. – 8:00 a.m.:

Breakfast (doughnuts and coffee)

8:00 a.m – 9:00 a.m:

PLC Ideas and Elaboration by Principals for next school year.

What is in store for next year for our PLC community?

9:00 a.m – 11:30 a.m:

Promoting Positive Attitudes toward Technology Integration

Video: Promoting Positive Attitudes (http://www.youtube.com/watch?v=nL_vvm9AgzI

Assemble PLC's to Discuss the Stripling Cycle of Inquiry (See the attached Pamphlet) and how there is a need for lifelong learning. Use accompanying video to foster discussion.

Video: "E-Learning: Integrating Technology and Inquiry" (Prowse, 2010)

11:30 a.m – 1:00 p.m:

Lunch (On your own) - The administration will encourage educators to discuss the software during the time away from the session

1:00 p.m – 2:30 p.m:

Motivational Speaker: Dr. Adolph Brown, III - "Positive Attitudes and 21st Century Skills for Educators"

2:30 p.m – 3:15 p.m:

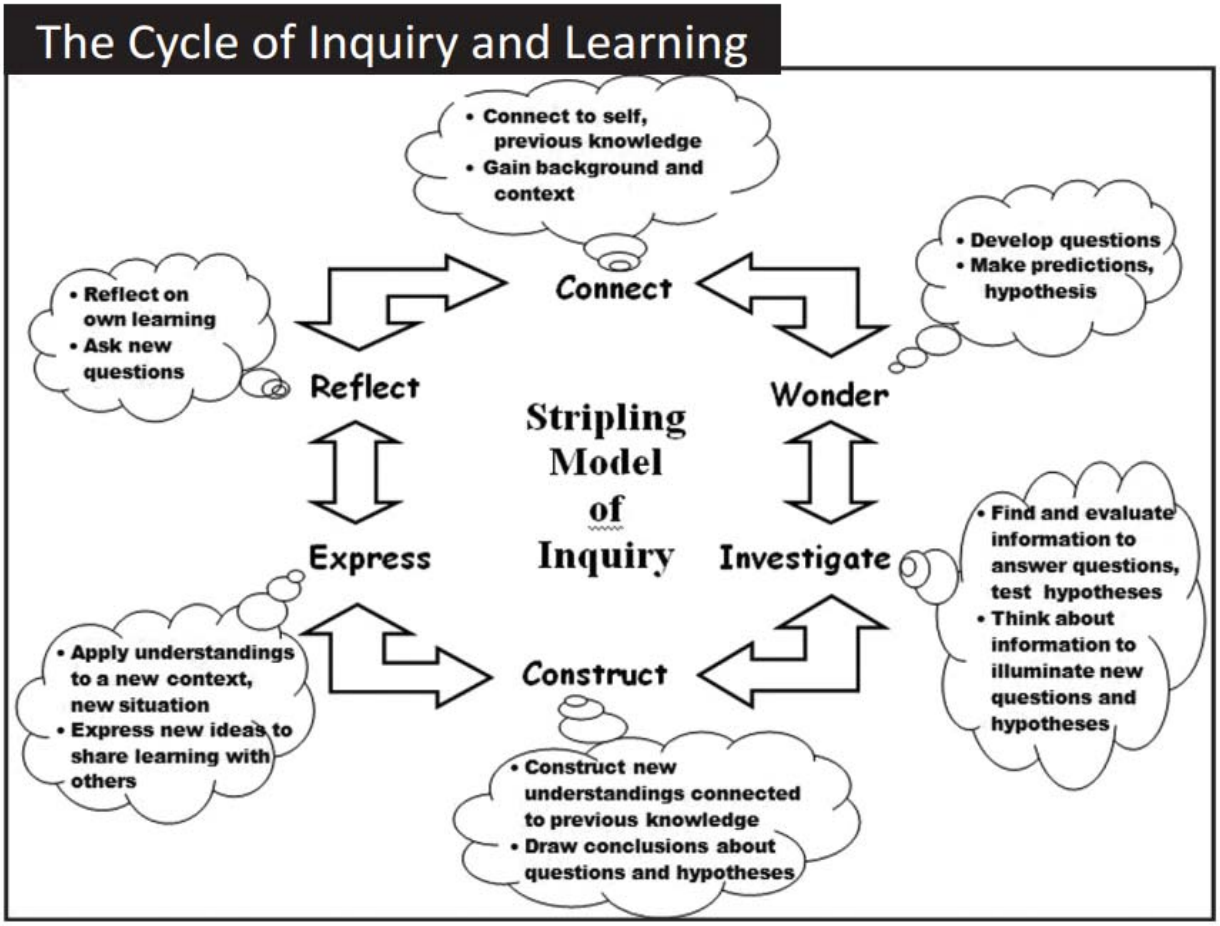
Assemble the PLC's to establish and discuss ways to promote positive attitudes towards technology integration and push these concepts into classroom instruction and student learning.

3:15 p.m. - 3:30 p.m.

Complete the Professional Development Session evaluation form.

MATERIALS FOR DAY FOUR

1. Stripling Model of Inquiry (Stripling, 2003)



2. "E-Learning: Integrating Technology and Inquiry" (Prowse, 2010)

http://www.youtube.com/watch?v=x8jtcnMh950

3. " Inspiring video on Positive Attitude" (AshwinkumarPoojary, 2010)

http://www.youtube.com/watch?v=nL_vvm9AgzI

Evaluation of PD workshop sessions

ILLINOIS STATE BOARD OF EDUCATION
Educator and School Development Division
100 North First Street, E-310
Springfield, Illinois 62777-0001

EVALUATION FOR WORKSHOP, CONFERENCE, SEMINAR, ETC.

DIRECTIONS: Please complete and return this form to the presenters of the professional development activity.

TITLE OF PROFESSIONAL DEVELOPMENT ACTIVITY	DATE

LOCATION (Facility, City, State)

NAME OF PROVIDER

Please answer the following questions by marking the scale according to your perceptions of this professional development activity.

	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
1. This activity increased my knowledge and skills in my areas of certification, endorsement or teaching assignment.	☐	☐	☐	☐	☐
2. The relevance of this activity to ISBE teaching standards was clear.	☐	☐	☐	☐	☐
3. It was clear that the activity was presented by persons with education and experience in the subject matter.	☐	☐	☐	☐	☐
4. The material was presented in an organized, easily understood manner.	☐	☐	☐	☐	☐
5. This activity included discussion, critique, or application of what was presented, observed, learned, or demonstrated.	☐	☐	☐	☐	☐

The best features of this activity were:

Suggestions for improvement include:

Other comments and reactions I wish to offer:

ISBE 77-21A (9/08) *(TO BE RETAINED BY PROVIDER FOR AT LEAST THREE YEARS)*

Print Reset Form

Trainer Notes for PD Sessions

Trainer Notes for Professional Development Sessions

BY
BRIAN MCKINLEY

Administrator/Trainer Notes – Day One

- Educational Technology Needs Assessment - The Educational Technology Needs Assessment will decide your abilities with technology use.
- Introductions of guest speakers and new hirees.
- Trainer will introduce the curriculum supervisors –Supervisors will discuss Common Core Standards and Technology Implementation (Depending on new and emerging technology, these topics should change from year to year)
- Trainer will use the SmartBoard to watch the following videos
  1. "Vision of the Common Core" (SchoolImprovement.net, 2011)
  2. "Why we need the Common Core: I choose C?" (Gutierrez, R., 2012)
  3. "Common Core Standards Example Math Lesson" (KidsTeachnLearn, 2011)
- The trainer will impose key questions about the videos and open up a discussion about the common core.

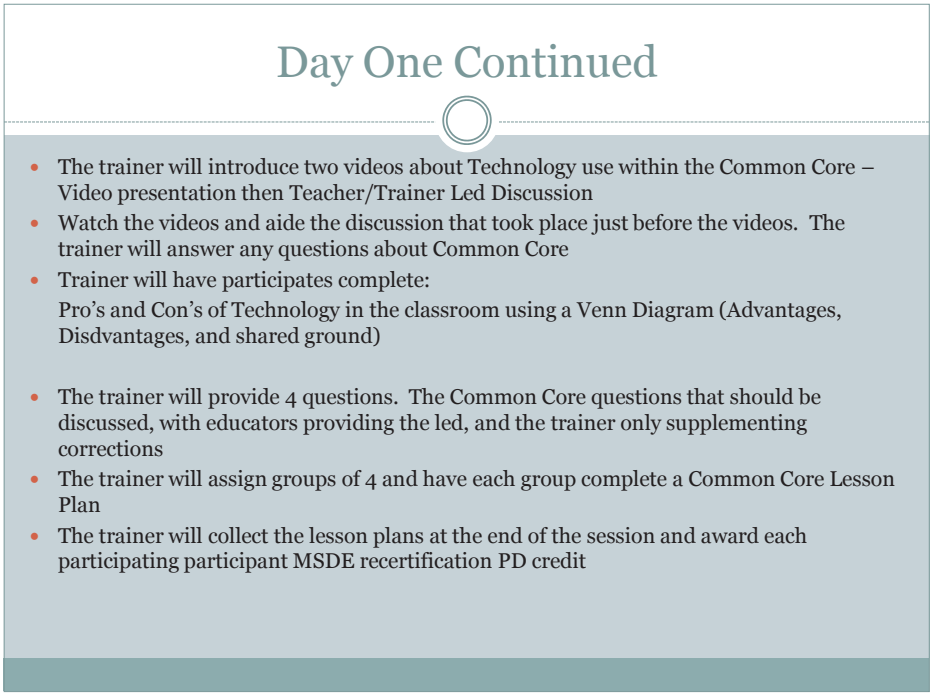
Subnotes:

Supervisors will discuss Common Core Standards and Technology Implementation (Depending on new and emerging technology, these topics should change from year to year)

Supervisors will pose the following questions:
1. What changes will be implemented following the implementation of Common Core?
2. What can we, as a system, do to prepare for the change?

The trainer will show the videos:
1. "Vision of the Common Core" (SchoolImprovement.net, 2011)
2. "Why we need the Common Core: I choose C?" (Gutierrez, R., 2012)
3. "Common Core Standards Example Math Lesson" (KidsTeachnLearn, 2011)

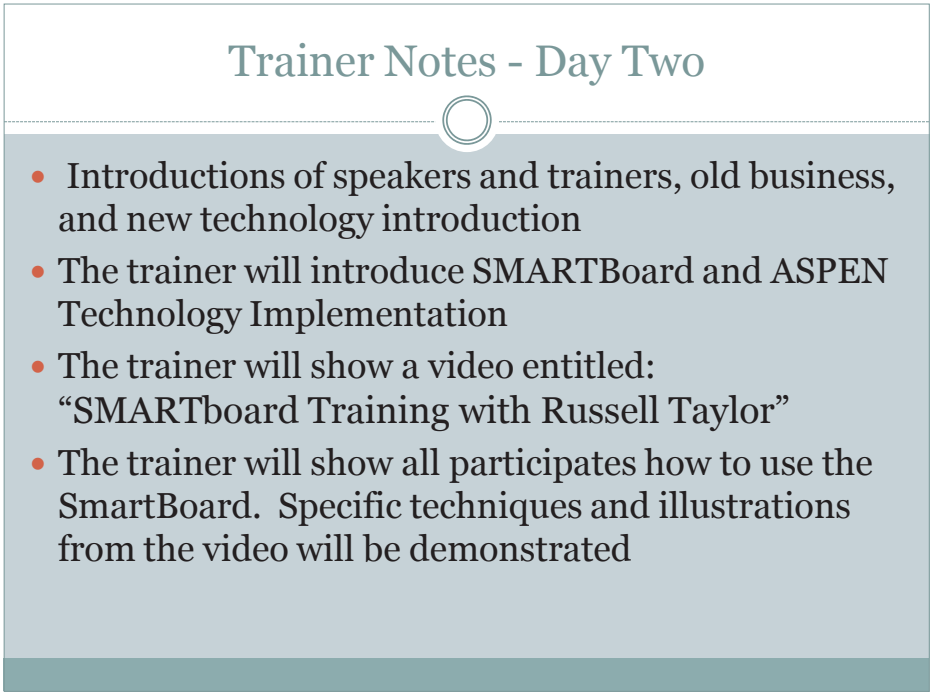
Key questions the trainer will impose for educators to answer:
1. What will the Common Core do for our county? Country? Globally?
2. Is the Common Core necessary? If so, why?
3. Name what subject matter disciplines the Common Core Encompasses.



The trainer will play the two videos:
1. "What's the 411: Teachers, Technology and the Common Core" (DiscoveryEducation.com, 2012)
2. "Technology and the Common Core Standards" (Atomiclearning.com, 2012)

A discussion based around these questions will be led by the trainer:
1. How much and how often should technology be used in classroom instruction?
2. Should we, as teachers, allow students to use technology in the classroom (i.e. tablets, Ipads, Iphones, Smart phones, laptops, etc.)
3 . What should we, as educators, do if we do not know the correct way to implement technology into a Common Core lesson.

4. Read and watch the attached video in the article “"How Teachers are Integrating Technology into the Common Core." (Sitkins, 2013)



Subnotes:

The trainer will start with a video entitled "SMARTboard Training with Russell Taylor." (AdamSmithCollege, 2011). Since all classrooms are equipped with SMARTboards, the trainer will show and guide educators through the steps as the video is running. The trainer will do more in-depth illustrations of embedded SMARTboard techniques and how to use the special features of the technology when the video session is completed. Finally, the ASPEN program and all of its features will be pre-viewed in their entirety. The trainer will show a quick video entitled "ASPEN Introduction to the Family Portal" and then show in-depth illustrations and instructions on how to use and integrate the program into your teaching and class management.

Day Two Continued

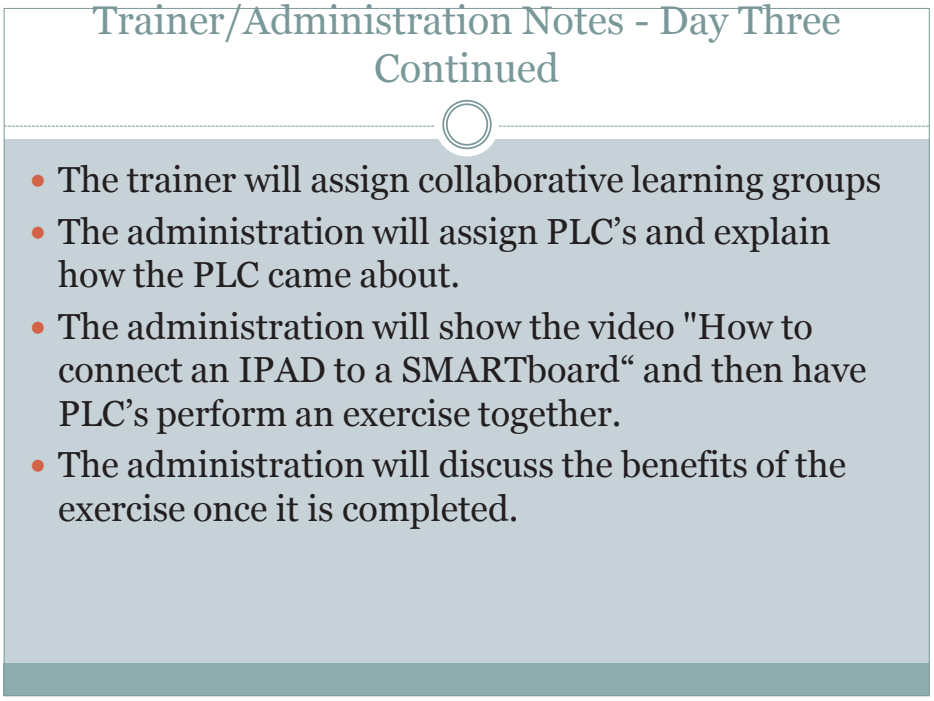
- The trainer will instruct the educators to complete a compare and contrast Common Core model to highlight the advantages and disadvantages of the technology
- The superintendent of the school district will discuss the advantages and disadvantages of the SmartBoard and ASPEN
- The trainer will instruct all educators to complete a self-evaluation paragraph based around their technology skills after the PD session is completed.

Trainer Notes - Day Three

- The trainer will review New technology from first and second day and Introduce the SMARTboard TABLET and the IPAD as an interactive device for the SMARTboard
- The trainer will have the educators turn on their laptops and access the website http://www.informationweek.com/education/mobility/why-tablets-will-kill-smart-boards-in- cl/240145886. The trainer will ask if everyone can access the site to ensure all participants can access the Internet
- The trainer will have an Independent Software Exploration of TABLET (one tablet per person will be available) and instruct each educator to design a K-W-L list (Ogle, 1986). The KWL chart will be used as the "exit slip"

Subnotes:

All Participants will read the article titled: "Why Tablets Will Kill Smart Boards In Classrooms" (Fowlkes, 2013) and complete a compare and contrast table that will compare the SMARTboard and the Tablet. Then complete the "Narrowing Down a Subtopic Example."



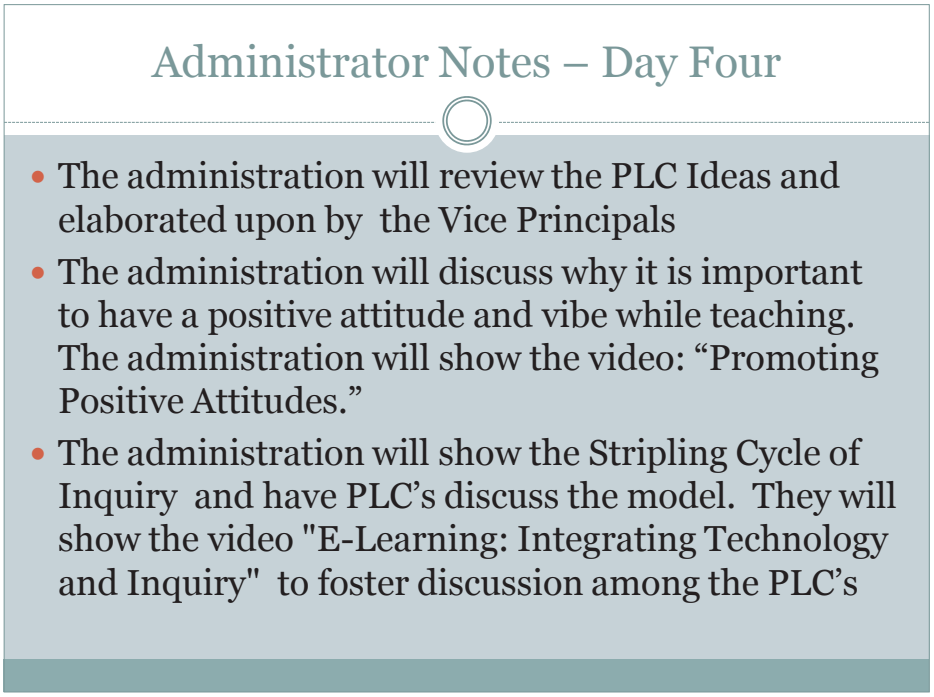
Subnotes:

Collaborative learning groups will explore the software together highlighting at least 3 major weaknesses or strengths of the software
Introduction of PLC's and how the administration designed the PLC's using the "Educational Technology Needs Assessment" survey results (Skill based: Each group will be given at least one - 4 level skill person from each discipline and one 1-level skill person from each discipline)

The administration will explain and answer the following questions:

1. What is a PLC?
2. What is a PLC used for?
3. How were the PLC's assembled? What criteria was used?

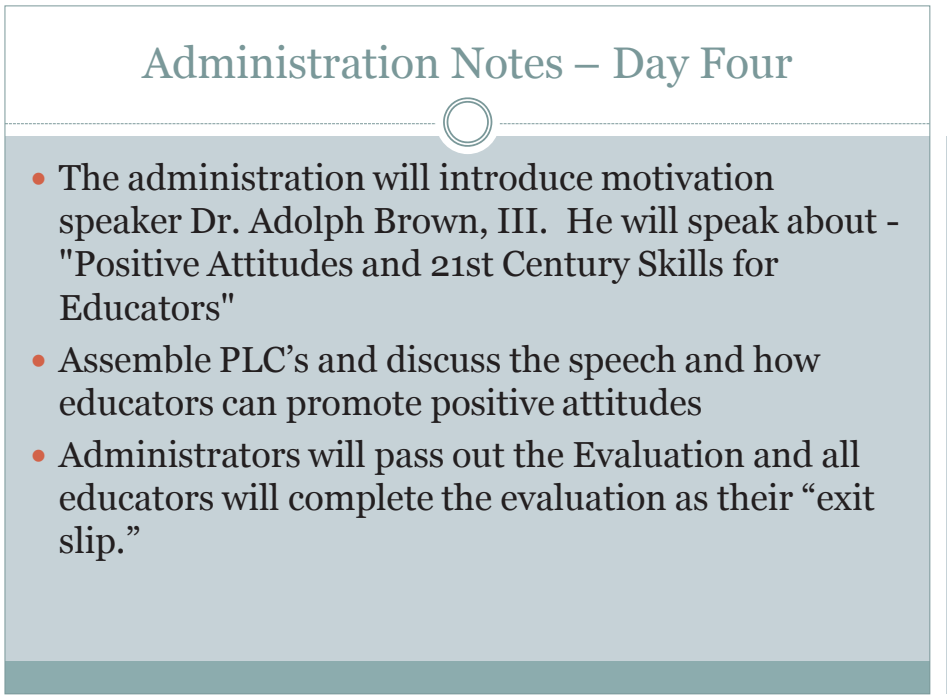
After the video, each group will be given one iPad and will be instructed to work together to connect the IPad to the Smartboard . This is a team building/member compatibility check, as well as, a technology skill exercise.
The administration will explain that the exercise was to build confidence within the group and get to know and understand what role each person will have.



Subnotes:

The administration will pose the question, What is in store for next year for our PLC community?
They will explain the processes (What must be done) , times (When PLC's meet and what is expected), and schedule (Technology Implementations) for the upcoming school year.
When discussing the model, the administration will be looking for ideas based around the following:

1. How will we use it next school year?
2. How can we use the model to increase technology skills and integrate the model in to the PLC?
3. How can we incorporate the model in to daily technology lesson plans?



Cost

In the school district, many teachers are content specific and are sometimes more knowledgeable than an outside source. For example, I have been selected numerous times throughout his career to attend technology workshops and then return to his home school to diffuse the information or present it in a professional development meeting. In the school district in question, it is more cost effective and logical to have a teacher trained in current technology for two reasons: (1) The school district Board of Education only has to pay four teachers per school to be trained instead of paying a consulting firm or professional technology company to present the desired information, and (2) the teachers that are trained are embedded throughout the school system and reside in the schools or buildings. Thus, supplying help when called upon. If there is a need for a

budget, here is what it the typical budget for professional development meetings in the school district would look like:

Budget for one content area (First 2 Days):

Technology Software (budgeted for 150 seat licenses): $5,000

Technology Trainer/Teacher's Summer Stipend Salary (Depending if teacher had to attend a training during the summer or during the school year): $1,500

Breakfast (Doughnuts and Coffee): $100.00

Grand Total: $6,600 per content area

School District Total: $26,400

Budget for Third Day of PD:

Breakfast (Doughnuts and Coffee): $100.00

IPad cost: $19,000 (One per every 4 educators)

School District Total: $19,100

Budget for Fourth Day of PD:

Motivational Speaker Cost: 5,000

Breakfast (Doughnuts and Coffee): $100.00

Grand Total: per content area $5,100

School District Total: $20,400

Evaluation

Every program, presentation, or lecture that is used for teaching or instructional purposes must be evaluated. Summak, Sammancioglu, and Baglibel (2010) stated that the evaluation of technology and how it is used in education is necessary for stakeholders, policy-makers, and administrators. Lincoln (1982) stated that an evaluation can be seen as how much something is worth or what value it possesses. Furthermore, Galbraith (2004) stated that when using a proper evaluation tool, the teacher and learner communicate better, learn better and at a better pace, while also moving to the future in a better direction. Galbraith (2004) also posited that any method of teaching would be rendered useless if a decent monitoring process were not included. He reiterated that adult education instructors must give critical feedback and supply encouragement and guidance to participants of programs (Galbraith, 2004, pg. 376).

The goals of the professional development workshop series are to: (1) alert the stakeholders (superintendent of the school system, curriculum supervisors, and administration) of the technological deficiencies that educators in the school district possess, (2) improve the technological skills of all secondary educators, (3) increase technology use in the classroom, and (4) improve attitude toward technology. The evaluation for the professional development project will be a goals-based evaluation. The goals-based evaluation was chosen by me because it will allow me to collect, synthesize, and process the given information for a reason that is authentic and useful for the entire school district. The goals for the project will be evaluated formatively by using a small qualitative survey, classroom observations, and random sample interviews of the

secondary education population in the school district. According to Knowles, Holton, and Swanson (2011), formative evaluations should be diagnostic in nature and be used to improve learning. Due to legality issues, the curriculum supervisors and school administrators will conduct the observations and interviews. The evaluation process for this professional development project is not like a "one-time" survey. The educator evaluations must be completed on a continuum for multiple years to ensure that technology is being used correctly and consciously in the classroom. As educators in the school district increase their technological skills and improve their attitude toward technology integration throughout multiple consecutive school years, the formative evaluations will become routine and foster more discussions of what needs to be added or deleted from the school district.

At the beginning of the first technology professional development, the curriculum supervisor and I will distribute the survey entitled “Educational Technology Needs Assessment” (See Appendix A). The survey will be completed and returned to the curriculum supervisor and the researcher. The survey is designed to identify potential problem areas in the use of technology in classroom instruction and evaluate opinions and skill levels of all secondary level educators in the school district. In addition, randomly selected participants will take part in a five minute interview with the researcher two weeks after the professional development workshop has been completed, and other educators will be subjected to observations by the content area supervisor to monitor and indicate if any changes have occurred. These methods will be used to identify problematic areas, areas of concern, and areas of strength. The survey,

observations, and interviews must be completed to identify the problematic areas so the administration can assign PLC's that will find and alleviate any potential issues in the future.

The researcher, superintendent, curriculum supervisors, and administration will use the survey to address the following: (1) Will your teaching style include technology as a result of the professional development workshops? and (2) Have your questions and overarching concerns about new technology been addressed through the professional development workshops? The survey is designed to allow teachers the opportunity to answer questions about their own teaching style and identify current technological problems that they are having in their classrooms. This will aide in the construction of the PLC's.

The observations will be completed one to two weeks after each technological professional development workshop has occurred. All participants will be randomly selected, omitting the first round of participants, and have the opportunity to decline the observation if they decide not to participate. The observations will take place in the interviewees' home school or home building. Each observation should not last any longer than 30 minutes. The observation will be completed at the interviewee's discretion and by the content subject supervisor.

Table 7: Observation checklist that will be used for the project evaluation:

Question	Yes	No
1. Does the educator have any types of technology in his/her classroom?		
2. Does the educator use the technology they have been provided? How long during one instructional period does he/she use the provided technology: _____ minutes.		
3. Do students use any technology during instruction? How often and for how long do they use technology during one class period:_____times, _____ minutes		
4. If multiple visits are made, does the educator consistent use technology during classroom instruction?		
5. Does it appear that the professional development workshop series is helping the educator use technology in instruction?		
Supervisor Comments:		

The observations have been designed so the supervisors can discuss and alleviate problems that have been associated with the new technology or integrating the

technology into instruction. The observation results will be finalized and collated into hard copies.

Every researcher has a set of defined questions that must be answered to ensure that their research is valid and reliable (Kelley, Clark, Brown, and Sitzia, 2003). These questions are the building blocks to research. The guiding questions for the interview evaluations are as follows:

A. Have your technological skills improved since the beginning of the professional development workshop series?
B. Since the inception of the PD workshop series, has the amount of technology you use in your current instructional practices increased or decreased? Explain.
C. Has your resistance to technology and your attitude towards technology changed since the culmination of the professional development workshops?

I will set up a meeting with all administrators and curriculum supervisors to discuss the results. Once the results have been discussed, I will finalize a proposal of change and set up a meeting with the superintendent of schools to discuss possible solutions.

Appendix B: Confidentiality Agreement

Name of Signer:

During the course of my activity in collecting data for this research: A Quantitative Study that Determines the Affects of Demographics upon Technology Integration. I will have access to information, which is confidential and should not be disclosed. I acknowledge that the information must remain confidential, and that improper disclosure of confidential information can be damaging to the participant.

By signing this Confidentiality Agreement I acknowledge and agree that:

1. I will not disclose or discuss any confidential information with others, including friends or family.
2. I will not in any way divulge, copy, release, sell, loan, alter or destroy any confidential information except as properly authorized.
3. I will not discuss confidential information where others can overhear the conversation. I understand that it is not acceptable to discuss confidential information even if the participant's name is not used.
4. I will not make any unauthorized transmissions, inquiries, modification or purging of confidential information.
5. I agree that my obligations under this agreement will continue after termination of the job that I will perform.
6. I understand that violation of this agreement will have legal implications.
7. I will only access or use systems or devices I'm officially authorized to access and I will not demonstrate the operation or function of systems or devices to unauthorized individuals.

Signing this document, I acknowledge that I have read the agreement and I agree to comply with all the terms and conditions stated above.

Signature: **Date:**

Appendix C: Letter of Cooperation

Letter of Cooperation from the ABC School District Board of Education

Community Research Partner Name: ABC School District Board of Education

Contact Information: Dr. David Cox, Superintendent of Schools

Date: February 22, 2013

Dear Brian Michael McKinley,

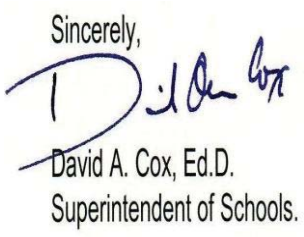
Based on my review of your research proposal, I give permission for you to conduct the study entitled A Quantitative Study that Determines the Affects of Demographics upon Technology Integration within the ABC School district school system. As part of this study, I authorize you to survey all secondary education teachers on the topic of technology integration in the school district, as well as, collect and analyze the data. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: one computer lab per school rooms, and an Internet connection, that the partner will provide. 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,



David A. Cox, Ed.D.
Superintendent of Schools.

Appendix D: Data Collection Coordination Request

Date: March 1, 2013

Dear Mr. Lewis,

I have obtained the principal's support to collect data for my research project entitled

A Quantitative Study that Determines the Affects of Demographics upon Technology Integration

I am requesting your cooperation in the data collection process. I propose to collect data on March 1, 2013 – March 15, 2013. I will coordinate the exact times of data collection with you in order to minimize disruption to your instructional activities.

If you agree to be part of this research project, I would ask that you allow the data to be collected during non-instructional time (i.e. planning time) or during all common planning time from 2:45-3:15.

If you prefer not to be involved in this study, that is not a problem at all.

If circumstances change, please contact me via brian.mckinley@acps.k12.md.us or 301-724-1963

Thank you for your consideration. I would be pleased to share the results of this study with you if you are interested.

I am requesting your signature to document that I have cleared this data collection with you. (For email versions of this letter, you may instead state, I am requesting that you reply to this email with "I agree" to document that I have cleared this data collection with you.)

Sincerely,

Brian McKinley

Printed Name of Principal

Gene Morgan

Date:

2/21/13

Principal's Written or Electronic* Signature

Gene Morgan

Researcher's Written or Electronic* Signature

R.M.

Appendix D: Data Collection Coordination Request

Date: March 1, 2013

Dear Mr. Calhoun,

I have obtained the principal's support to collect data for my research project entitled

A Quantitative Study that Determines the Affects of Demographics upon Technology Integration

I am requesting your cooperation in the data collection process. I propose to collect data on March 1, 2013 – March 15, 2013. I will coordinate the exact times of data collection with you in order to minimize disruption to your instructional activities.

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If circumstances change, please contact me via brian.mckinley@acps.k12.md.us or 301-724-1963

Thank you for your consideration. I would be pleased to share the results of this study with you if you are interested.

I am requesting your signature to document that I have cleared this data collection with you. (For email versions of this letter, you may instead state, I am requesting that you reply to this email with "I agree" to document that I have cleared this data collection with you.)

Sincerely,

Brian McKinley

Printed Name of Principal Michael S. Calhoun

Date: 2-19-2013

Principal's Written or Electronic* Signature

Researcher's Written or Electronic* Signature

Appendix D: Data Collection Coordination Request

Date: March 1, 2013

Dear Mr. Lewis,

I have obtained the principal's support to collect data for my research project entitled

A Quantitative Study that Determines the Affects of Demographics upon Technology Integration

I am requesting your cooperation in the data collection process. I propose to collect data on March 1, 2013 – March 15, 2013. I will coordinate the exact times of data collection with you in order to minimize disruption to your instructional activities.

If you agree to be part of this research project, I would ask that you allow the data to be collected during non-instructional time (i.e. planning time) or during all common planning time from 2:45-3:15.

If you prefer not to be involved in this study, that is not a problem at all.

If circumstances change, please contact me via brian.mckinley@acps.k12.md.us or 301-724-1963

Thank you for your consideration. I would be pleased to share the results of this study with you if you are interested.

I am requesting your signature to document that I have cleared this data collection with you. (For email versions of this letter, you may instead state, I am requesting that you reply to this email with "I agree" to document that I have cleared this data collection with you.)

Sincerely,

Brian McKinley

Printed Name of Principal Steve Lewis

Date: 02-19-2013

Principal's Written or Electronic* Signature

Researcher's Written or Electronic* Signature

Appendix E: Consent Form

Consent Form

You are invited to take part in a research study of the effects of demographics and attitude on technology integration. The researcher is inviting all secondary education teachers from the three high schools in the district to participate in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part. This study is being conducted by a researcher named Brian Michael McKinley, who is a doctoral student at Walden University. The researcher is not a supervisor or administrator and therefore has no authority over any participants. You may already know the researcher as a colleague, but this is separate from that role.

Background Information:
The purpose of this study is to inspect the demographic and technology characteristics of the three high schools in the school district.

Procedures:
If you agree to be in this study, you will be asked to:
Complete one online survey that will take approximately 30 minutes
Here are some sample questions:

1. How often are you (the teacher) using digital tools and resources during the instructional day?
2. How often are your students using digital tools and resources during the instructional day?
3. I engage students in learning activities that require them to analyze information, think creatively, make predictions, and/or draw conclusions using the digital tools and resources (e.g., Inspiration/Kidspiration, Excel, InspireData) available in my classroom.

Benefits of the Study:
While there are no direct employment benefits for the participants who complete the survey, there are underlying benefits that will help all participants in the future. The study will address the technological needs of the secondary educators in the school district and attempt to redesign the professional development processes in the district while improving the technological infrastructure throughout the secondary education school system.

Voluntary Nature of the Study:
The study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one in the Board of Education will treat you differently if

you decide to not participate in the study. If you decide to join the study now, you can still change your mind later. You may withdraw from the study at any time.

Risk and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as stress. Being in this study would not pose risk to your safety or well-being.
Please answer the following questions before submitting your consent form:

1. Are you in a crisis situation? Yes or No
2. Are you mentally disabled? Yes or No
3. Are you emotionally disabled? Yes or No

Payment:
Every educator will be given a thank you card and a coupon for a free coffee from a local convenience store.

Privacy:
Any information you provide will be kept anonymous. All demographic information will be encoded by LoTi and delivered coded to the researcher. In addition, the researcher will not be given access to personal information. Therefore the researcher will not be able to use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure by using encryption software and an anonymous local server where access is only allowed by the researcher. Data will be kept for a period of at least 5 years, as required by the University.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher at brian.mckinley@waldenu.edu or 240-580-4148. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 1-800-925-3368 extension 3121210. Walden University's approval number for this study is ___ and it expires on ____.

Statement of Consent:
I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By completing the online survey, I understand that I am agreeing to the terms described above.

If you agree to the terms described above and want to participate in the study, hold down the control key and click the following hyperlink:
www.loticonnection.com

If the participant chooses to participate in the study, the participant should print a copy of this consent form to keep for personal records

Appendix F: LoTi Survey

Participants will answer the Demographics questions (1-5) using the drop down menu offered by the LoTi company.

Participants will answer questions 1-5 using the following responses: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree. and (5)Strongly Agree

Participants will answer the 34 LoTi questions using the following responses: Never (0), At least once a year (1), At least once a semester (2), At least once a month (3), A few times a month (4), At least once a week (5), A few times a week (6), and At least once a day (7)

At the conclusion of the survey, the LoTi software will give a score to each participant based on technology implementation, personal computer use, and current technology-based instruction practices with a six level scale: Level 0: Non-Use, Level 1: Awareness, Level 2: Exploration, Level 3: Infusion, Level 4a: Integration (Mechanical), Level 4b: Integration (Routine), Level 5: Expansion, and Level 6: Refinement

Attitudinal Questions:

I feel the use of technology is a positive dimension in classroom instruction?

I feel the use of technology in classroom instruction detracts from learning?

I feel confident in my ability to use technology in the classroom?

What are the largest barriers, or key factors, that are keeping you from integrating technology into classroom instruction?

Lack of time: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5)Strongly Agree

Lack of knowledge: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree

Lack of funding: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree

I don't believe in using technology to teach: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree

What kind of training do you feel would be necessary to prepare you to use technology in the classroom?

Teacher focused: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5)Strongly Agree

Administration focused: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5)Strongly Agree

Professional trainer focused: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5)Strongly Agree

Online Professional Development: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5)Strongly Agree

LoTi Questions:

1: I engage students in learning activities that require them to analyze information, think creatively, make predictions, and/or draw conclusions using the digital tools and resources (e.g., Inspiration/Kidspiration, Excel, InspireData) available in my classroom.

2: Students in my classroom use the digital tools and resources to create web-based (e.g., web posters, student blogs or wikis, basic webpages) or multimedia presentations (e.g., PowerPoint) that showcase digitally their research (i.e., information gathering) on topics that I assign more than for other educational uses.

3: I assign web-based projects (e.g., web collaborations, WebQuests) to my students that emphasize complex thinking strategies (e.g., problem-solving, decision-making, experimental inquiry) aligned to the content standards.

4: I provide multiple and varied formative and summative assessment opportunities that encourage students to "showcase" their content understanding in nontraditional ways

5: I use the digital tools and resources in my classroom to promote student creativity and innovative thinking (e.g., thinking outside the box, exploring multiple solutions).

6: My students identify important real world issues or problems (e.g., environmental pollution, elections, health awareness), then use collaborative tools and human

resources beyond the school building (e.g., partnerships with business professionals, community groups) to solve them.

7: I promote, monitor, and model the ethical use of digital information and technology in my classroom (e.g., appropriate citing of resources, respecting copyright permissions).

8: I use different digital media and formats (e.g, blogs, online newsletters, online lesson plans, podcasting, digital documents) to communicate information effectively to students, parents, and peers.

9: My students discover innovative ways to use our school's advanced digital tools (e.g., digital media authoring tools, graphics programs, probeware with GPS systems) and resources (e.g., publishing software, media production software, advanced web design software) to pursue their individual curiosities and make a difference in their lives and in their community.

10: I model and facilitate the effective use of current and emerging digital tools and resources (e.g., streaming media, wikis, podcasting) to support teaching and learning in my classroom.

11: I use my school's digital tools and resources primarily to access the Internet, communicate with colleagues or parents, grade student work and/or plan instructional activities for my students.

12: I alone use the digital tools and resources in my classroom for tasks such as planning, preparing, presenting, and/or grading instructional activities.

13: I use different technology systems unique to my grade level or content area (e.g., online courseware, Moodle, WAN/LAN, interactive online curriculum tools) to support student success and innovation in class.

14: I employ learner-centered strategies (e.g., communities of inquiry, learning stations/centers) to address the diverse needs of all students using developmentally-appropriate digital tools and resources.

15: Students' use of information and inquiry skills to solve problems of personal relevance influences the types of instructional materials used in my classroom.

16: My students participate in collaborative projects (e.g., Jason Project, GlobalSchoolNet) involving face-to-face and/or virtual environments with students of other cultures that address current problems, issues, and/or themes.

17: My students use the available digital tools and resources for (1) collaboration with others, (2) publishing, (3) communication, and (4) research to solve issues and problems of personal interest that address specific content standards.

18: I model for my students the safe and legal use of digital tools and resources when I am delivering content and/or reinforcing their understanding of pertinent concept using multimedia resources (e.g., PowerPoint, Keynote)

19: My students model the "correct and careful" (e.g., ethical usage, proper digital etiquette, protecting their personal information) use of digital resources and are aware of the consequences regarding their misuse.

20: I participate in local and global learning communities to explore creative applications of technology toward improving student learning.

21: I continue to offer students learning activities that emphasize the use of digital tools and resources to solve "real-world" problems or issues, even though I sometimes experience issues during project implementation (e.g., student discipline problems, network errors, lack of time to plan the lessons, technical glitches).

22: I prefer using standards-based instructional units and related student learning experiences recommended by colleagues that emphasize innovative thinking, student use of digital tools and resources, and student relevancy to the real world.

23: I seek outside help with designing student-centered performance assessments using the available digital tools and resources that involve students transferring what they have learned to a real world context.

24: I rely heavily on my students' questions and previous experiences when designing learning activities that address the content that I teach.

25: My students use the classroom digital tools and resources to engage in relevant, challenging, self-directed learning experiences that address the content standards.

26: I design and/or implement web-based projects (e.g., WebQuests, web collaborations) in my classroom that emphasize the higher levels of student cognition (e.g., analyzing, evaluating, creating).

27: My students use the digital tools and resources in my classroom primarily to increase their content understanding (e.g., digital flipcharts, simulations) or to improve their basic math and literacy skills (e.g., online tutorials, content-specific software).

28: My students use digital tools and resources for research purposes (e.g., data collection, online questionnaires,Internet research) that require them to investigate an issue/problem, take a position, make decisions, and/or seek out a solution.

29: My students collaborate with me in setting both group and individual academic goals that provide opportunities for them to direct their own learning aligned to the content standards.

30: I promote global awareness in my classroom by providing students with digital opportunities to collaborate with others of various cultures.

31: My students apply their classroom content learning to real-world problems within the local or global community using the digital tools and resources at our disposal.

32: My students and I use the digital tools and resources (e.g., interactive whiteboard, digital student response system, online tutorials) primarily to supplement the curriculum and reinforce specific content standards.

33: Problem-based learning occurs in my classroom because it allows students to use the classroom digital tools and resources for higher-order thinking (e.g., analyzing, evaluating, creating) and personal inquiry.

34: My students use all forms of the most advanced digital tools (e.g., digital media authoring tools, graphics programs, probeware with GPS systems, handheld devices) and resources (e.g., publishing software, media production software, advanced web design software) to pursue collaborative problem-solving opportunities surrounding issues of personal and/or social importance.

35: I advocate for the use of different assistive technologies on my campus that are available to meet the diverse demands of special needs students.

36: I promote the effective use of digital tools and resources on my campus and within my professional community and actively develop the technology skills of others.

37: I consider how my students will apply what they have learned in class to the world they live when planning instruction and assessment strategies.

Appendix G: Data Agreement Use

This Data Use Agreement, effective as of February 19, 2013 is entered into by and between Mr. Brian Michael McKinley and the LoTi connection. The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA Regulations.

1. Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. The Loti Connection shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA Regulations

3. Data Fields in the LDS. No direct identifiers such as names may be included in the Limited Data Set (LDS). In preparing the LDS, the LoTi connection shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: mean, median, mode, and standard deviation for all ages, LoTi scores, and technology inventory scores, as well as, an overall LoTi score for each participant.

4. Responsibilities of Data Recipient. Data Recipient agrees to:

    a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

    b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

    c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

    d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

    e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

5. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for its research activities only.

6. Term and Termination.

    a. Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

    b. Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

    c. Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

    d. For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

    e. Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

7. Miscellaneous.

    a. Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

    b. Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

    c. No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

d. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

DATA PROVIDER	**DATA RECIPIENT**
Signed: _____	Signed: _____
Print Name: _____	Print Name: _____
Print Title: _____	Print Title: _____

Curriculum Vitae

Brian Michael McKinley

Education

Walden University, Minneapolis, MN 2013

Ed.D. in Education

Concentration: Higher Education and Adult Leadership

Dissertation: "A Quantitative Study that Determines the Affects of Demographics upon Technology Integration"

Frostburg State University, Frostburg, MD 2009-2010
Vice-Principal Certification
Concentration: Administration and Supervision

Frostburg State University, Frostburg, MD 2004
M.Ed. in Education
Concentration: Curriculum and Instruction with a focus on Educational Technology

Frostburg State University, Frostburg, MD 2000
Bachelors of Science
Concentration: Mathematics
Minor: Education

Teaching Experience:

Remedial Math Specialist 2000-2001

Mathematics Teacher 2001-Present

College Algebra Teacher	2010-Present

Experience in Committees

School Improvement Chairperson	2001-Present
MSAP Team Leader and Member	2001-Present
Website Design and Technology Specialist	2001-2004
Instructional Leader and Mathematics Department Chairperson	2012-Present

Trainings

Algebra 1 and Geometry Summer Workshop	2001-2006
MSAP Substance Abuse Training	2001-Present
Algebra 1 Governor's Academy	2004
Vertical Team Training	2006
The Streiby Academy: Math in Motion	2008-2010
Advanced Placement Calculus Training	2011
The Garver Academy: Coaching and Mentoring	2010-2011
Educator Effectiveness Academy	2011 - Present
Common Core Academy Training	2011-Present
Instructional Leader Academy	2012 - Present