Promoting Meaningful Uses of Technology in a Middle School

by

Kristen Robertson

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Graduate Supervisory Committee:

David Moore, Chair
Gregory Cheatham
Ruth Catalano

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ABSTRACT

Federal education policies call for school district leaders to promote classroom technology integration to prepare students with 21st century skills. However, schools are struggling to integrate technology effectively, with students often reporting that they feel like they need to power down and step back in time technologically when they enter classrooms. The lack of meaningful technology use in classrooms indicates a need for increased teacher preparation.

The purpose of this study was to investigate the impact a coaching model of professional development had on school administrators' abilities to increase middle school teachers' technology integration in their classrooms. This study attempted to coach administrators to develop and articulate a vision, cultivate a culture, and model instruction relative to the meaningful use of instructional technology.

The study occurred in a middle school. Data for this case study were collected via administrator interviews, the Principal's Computer Technology Survey, structured observations using the Higher Order Thinking, Engaged Learning, Authentic Learning, Technology Use protocol, field notes, the Technology Integration Matrix, teacher interviews, and a research log. Findings concluded that cultivating change in an organization is a complex process that requires commitment over an extended period of time. The meaningful use of instructional technology remained minimal at the school during fall 2010. My actions as a change agent informed the school's administrators about the role meaningful use of technology can play in instruction. Limited professional

development, administrative vision, and expectations minimized the teachers' meaningful use of instructional technology; competing priorities and limited time minimized the administrators' efforts to improve the meaningful use of instructional technology. Realizing that technology proficient teachers contribute to student success with technology, it may be wise for administrators to incorporate technology-enriched professional development and exercise their leadership abilities to promote meaningful technology use in classrooms.

DEDICATION

This dissertation is dedicated to my family, friends, professors, and colleagues who have supported and encouraged me throughout the doctoral program. Special thanks to my family who encouraged and believed in me and to Greg Martin for reminding me to "relax." To the students of the 21st Century, this research is for you. It is my hope that I can touch one teacher, administrator, parent, or policy maker so that you may receive an education that stimulates your mind and motivates you to succeed.

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Without the financial assistance provided by the Mary Lou Fulton Teacher's College, my dreams of completing this doctoral study would not have yet been realized. It was with their support that I was able to accomplish this goal at this juncture in my career.

The guidance provided by the members of my committee, Dr. David Moore, Dr. Greg Cheatham, and Dr. Ruth Catalano supported my professional and personal growth encouraging me to stretch farther and examine my beliefs about education and the role that research plays. I especially appreciate the countless hours of reviewing, encouraging, and most of all patience demonstrated throughout the entire process. With their support, I have been able to accomplish my goal of acquiring my doctoral degree.

I would also like to thank Jennifer Lane and Shelee King George for mentoring me to grow as a technology leader. I have learned a lot about the peer coaching process and technology integration through the time we have spent together.

I also appreciate the willingness of my colleagues to participate in this study. Without their well articulated insights, thoughtful perceptions, and openness this research would not have been possible.

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Chapter 1 Introduction, Context and Purpose

> What we want for our children...we should want for their teachers, that schools be places of learning for both of them, and that such learning be suffused with excitement, engagement, passion, challenge, creativity, and joy (Hargreaves, 1995, p. 27).

Introduction

Technology has permeated every facet of our modern society and as a result, the workforce has seen the demand for skilled laborers decline and the need for creative problem solvers rise. This paradigm shift has impacted schools by altering the future needs of the learners they educate. Over the past two decades access to technology in schools has greatly improved. Unfortunately many classrooms are struggling to make meaningful use of technology for teaching and learning (Herman, 2002). As Jonassen, Peck, and Wilson (1999) indicate,

> The most productive and meaningful uses of technology will not occur if technologies are used in traditional ways- as delivery vehicles for instructional lessons. Technology cannot teach students. Rather, learners should use the technologies to teach themselves and others. They learn through teaching with technologies. Meaningful learning will result when technologies engage learners in: knowledge construction, not reproduction; conversation, not reception; articulation, not repetition; collaboration, not competition; reflection, not prescription (p.16).

Administrators, who would like to see an increase in technology-rich instruction would do well to embed technology-rich professional development into teachers' daily work. Supportive administrators, who understand that change is a highly individualized process requiring time, embedded training, and leadership are necessary for teachers to successfully integrate technology in the classroom (Dawson & Rakes, 2003). Without leadership it is unlikely that training and resources alone will lead to the desired level of integration. Furthermore, training tailored to the individual, practiced in the learning environment, and followed up afterwards has been shown to yield high-quality technology integration (Crandall & Loucks, 1982). In organizations where teachers and administrators were provided with the knowledge of how to integrate technology into rich and meaningful instruction rather than mere skill acquisition alone have shown to create systemic change in technology-rich instruction over time (Dawson & Rakes, 2003). Consequently, I set out to promote meaningful technology use at my school mainly by promoting the technology leadership of my school administrators.

Context

I work at Canyon Springs Middle School[1], where entry and adoption levels of technology integration are most common among my peers. A newly implemented district teacher evaluation rubric rates teachers as proficient if they "consistently plan for the use of technology resources (if available) to enhance the

[1] All local names are pseudonyms

learning of the objective" and as excelling if they "integrate technology in the teaching AND learning process for maximum student learning." School and district level administrators have commented on the need for increased use of the technological tools that are supplied (Wilson, personal communication, April 11, 2007; October 21, 2008; and November 13, 2009). Unfortunately, no strategic plan had been devised to address this. Due to innovative teachers and supportive administrators, my campus had acquired a number of technology resources. As of May, 2009, my school's technology inventory included the following:

- 45 SMART Boards
- 178 Dell desktop computers
- 26 document cameras
- 18 audio enhancement systems
- 48 projection systems
- 38 student response systems (CPS remotes)
- 6 laptops carts with 8 computers each, wireless access campus-wide
- 13 printers
- 4 copiers/scanners
- 1 poster maker
- 7 servers
- software site licenses such as Frames, WebBlender, ImageBlender, Share, Inspiration, All the Right Type, Read Naturally, Notebook 10, Paint, Comic Life, and Microsoft Office Suite

Unfortunately some of these resources were sitting idle due to a lack of on-going training and time that is designated to learning the application of the technological tools (Scott, personal communication, August 4, 2009).

While my school had acquired these learning technologies over the years, some of these resources were not being used to support learning well.

Before embarking on this action-research project, I spent more than a year investigating why the Canyon Springs teachers were not implementing the available technology in their classrooms for instruction and as tools to make their work more efficient. I spoke with teachers at my school and throughout the district, reflected on my own reasons for limited technology integration, and read research articles describing barriers that teachers were facing around the world. As a classroom teacher, what disturbed me most was the lack of time provided for training and preparation. It was evident that many technological resources had been provided. Yet on-going training and preparation time for the implementation of the resources purchased and placed in classrooms had been limited and in some cases non-existent. While other professionals, such as those within the health care field would not be expected to be issued new medical resources without proper training, many teachers were receiving equipment without training on how to effectively incorporate it into their classroom instruction. These teachers were expected to know what to do with this equipment and how to do it; if they did not, they were expected to figure it out—but when?

While on most days, teachers at my school received 40 minutes for preparation, the time allotted was hardly enough to cover all the activities they were expected to complete. Such activities included, but were not limited to, providing one-on-one assistance to students, sending and responding to emails, working on professional learning communities, submitting discipline referrals, calling or meeting to collaborate with other educators and parents, writing and revising lesson plans, making copies, grading, reviewing assessment data, researching best practices to meet the needs of students, locating and organizing materials, posting objectives, planning and organizing events and field trips, signing up for library and computer lab time, cleaning and organizing the classroom, setting up and tearing down bulletin boards, and, on occasion, using the restroom. Five to ten minutes of this time was often taken by travel between rooms and the office, leaving 30-35 minutes which equates to about two to two and a half hours per week to accomplish all of these tasks during contracted preparation time. Now, add in on-going professional development for new curriculum and resources. But when?

Due to the demands on their time, teachers acted like doctors triaging patients. Teachers determined which activities needed their immediate attention and which could be handled later; this goes on day-after-day, week-after-week, month-after-month, and year-after-year. Bring in technology; while some teachers found ways to incorporate meaningful technology use into their classroom instruction, many teachers have not. Those who found meaningful ways to incorporate technology in the classroom often taught themselves to do so.

I found myself asking about the other Canyon Springs' teachers. How can every teacher learn to integrate technology meaningfully? To my mind, the most obvious answer revolved around training and preparation time, yet limited time made it difficult to ensure that every teacher was exposed to the training. As a result, I decided that it would be best to work with the administrators in my school to establish a vision for technology and create a culture of innovation (Holland, 2000; International Society for Technology in Education, 2009; Murray, 2004; QIAT Consortium, 2006; Wisniewski, 1999). Working with administrators would allow me to help them model the meaningful use of technology in ways that teachers could replicate in their instruction.

For the purpose of this action research, meaningful use of technology refers to students' consistent use of technology in the classroom to learn content and demonstrate understanding of new knowledge and skills. Meaningful use of technology should be considered to be a seamless process in which the teacher is not teaching the technology, but rather the students are using the technology to acquire and make use of new knowledge. Students should have access to technology to support the acquisition of skills necessary for life in the 21st century.

Purpose

One way to promote the meaningful use of technology is to provide teachers with visionary leadership (International Society for Technology in Education, 2009). Visionary leaders inspire teachers, facilitate and support staff, develop technology-rich strategic plans, and advocate for technology needs on

local, state and national levels. When it comes to managing educators' daily tasks, teachers have seen a proliferation of digital management tools such as discipline tracking, attendance, and standardized assessment and reporting systems being utilized over the last few years. While digital course management tools have become commonplace, teachers are not handing over to students the very technologies educators rely on to conduct their jobs.

The goal of this investigation was to promote meaningful technology integration at my school. In particular, this action research project focused on my attempts to enable my school administrators to promote the meaningful use of technology. The following research question guided this study:

> What will happen when I promote the meaningful use of instructional technology at Canyon Springs Middle School?

Chapter 2 Review of Supporting Scholarship

This section reviews three domains of scholarship. The first discusses social constructivism, the theoretical lens used to focus this action research. The second includes professional development, the disciplinary frame used to support my innovation. The third domain describes the cycles of action research I conducted prior to this study that inform it.

Social Constructivism

Social constructivist learning theorists assert that learning occurs when individuals create knowledge from experience (Piaget, 1977; Vygotsky, 1978). An important aspect of social constructivism capitalizes on Vygotsky's zone of proximal development (ZPD) (Vygotsky, 1978). The concept of ZPD embraces the idea that learners progress through different stages of learning informally characterized as cannot yet do, can do with help, and can do alone (Lave & Wenger, 1991; Wells, 1999). After providing explicit instruction, instructional scaffolds are gradually removed so learners eventually function independently. The use of scaffolded instruction applies to teachers who are learning to integrate technology meaningfully into their classroom instruction. Administrators wanting teachers to increase the meaningful use of technology in the classroom may benefit from providing teachers with professional development that incorporates the use scaffolded technology instruction.

Another aspect of social constructivist learning theory posits that learning occurs in social contexts (Kauchak & Eggen, 1998). By providing learners collaborative learning experiences, some learners can act as more knowledgeable

others, working with their peers to move them from one stage of learning to the next. Learners create notions of their worlds based on previous experiences, culture, and background. Through failures and successes in interactive contexts, learners create new knowledge (Wertsch, 1997). As teachers learn and apply technology skills in meaningful ways in the classroom, they will determine lessons that work well and those that do not. Administrators who provide teachers with opportunities to share these experiences with colleagues may see an increase in meaningful technology use in the classroom.

Social constructivist theory views learners as active agents developing their own understandings of content through investigations. Active inquiry experiences provide learners with opportunities to discover new knowledge, concepts, and facts. This path to learning is often the result of learners inquiring together, building on one another's experience and knowledge base (Ernest, 1991). Administrators who conduct professional development within a culture of individuals, who share a common purpose, have good communication, and care for one another can facilitate a transfer of knowledge within a community that can create better learning conditions (Wenger, 1998). Vygotsky (1978) posited that active, socially embedded instruction promotes a deeper level of understanding than learning in isolation can provide. Such instruction includes authentic learning activities, problem-based inquiries, and peer collaboration. Administrators can maximize the time spent in staff meetings by providing teachers with an opportunity to learn and grow together as a staff. Administrators

can model meaningful technology use during staff meetings providing teachers with time to discuss and build on one another's experiences.

Professional Development

Professional development is the disciplinary framework used to focus this action research concerning technology integration. Fullan (1991) defines professional development as "the sum total of formal and informal learning experiences throughout one's career from pre-service teacher education to retirement" (p. 326). In this section, I present professional development relative to coaching and technological pedagogical content knowledge.

Coaching

As emphasized in the social constructivist theory, learners' knowledge is rooted in past experiences, backgrounds, and beliefs, all of which are unique to the individual yet grounded in social situations. The idea of coaching as a form of professional development for administrators is based on the idea that individuals will experience success when learning opportunities are tailored interactively to fit their unique personal and professional needs (Neufeld & Roper, 2003). According to Zeus and Skiffington (2002), coaching models assert that learners are unique individuals who are in need of individualized, one-on-one professional growth opportunities. Coaching is a vehicle for promoting lifelong personal and professional growth (Zeus & Skiffington, 2002). Administrators, as learners, may benefit from coaching as a strategy for meeting their professional and individual school's needs.

Successful coaching experiences are goal oriented. Once goals are set, success is derived from the learner's commitment to action and goal achievement (Robertson, 2005). This differs from traditional training models which often focus on curriculum, content, and competencies. Coaches facilitate administrators in achieving their identified goals. Administrators and coaches work together assessing the progress of the administrator's planned actions. Coaches also assist administrators in revising their original plans when needed. Coaches assist learners in maintaining focus until goals are accomplished (Hopkins-Thompson, 2000). This is a cyclical process which evolves to meet the needs of individuals (Grant, 2001; Hargrove, 2003; Zeus & Skiffington, 2002).

Goal-oriented coaching experiences provide people with comprehensive individualized learning (Day, 2000). With teacher responsibilities on the rise, it would be wise for administrators to find ways to identify connections between what may otherwise seem like diverging goals. Coaches can guide teachers and administrators to determine the interconnectedness of these goals and facilitate goal attainment. By making multiple connections, learners construct authentic lifelong learning through engaging and collaborative learning practices (Griffiths, 2005).

In line with Comer's (1995) belief that significant learning occurs only within significant relationships, coaching cultivates relationships that allow participants to work with someone who holds them accountable and encourages them to think creatively when problem solving. Elements shown to promote successful coaching relationships comprise power, trust, confidentiality, and

communication (Grant, 2001). Coaches' promote successful learning experiences by being actively engaged in deep listening and capitalizing on the power of questioning and feedback (Gross, 2004). Coaches facilitate learners' self-awareness by promoting self-monitoring and regulation. Coaching promotes focused attention to goals by developing strategies for solving problems and overcoming self-sabotaging behaviors (Gale, Liljenstrand, Pardieu, & Nebeker, 2002; Griffiths, 2005).

Peer coaching can support educators who are integrating technology to engage students (Norton & Gonzales, 1998). Peer coaching provides teachers with both ongoing and just-in-time support (Brush et al., 2003). Peer-Ed's Peer Coaching Program (Peer-Ed, n.d.) licensed by Microsoft's Partners in Learning Network, has been shown to increase the meaningful use of technology in classrooms and cultivate a culture of collaboration amongst teachers (Barron, Dawson & Yendol-Hoppey, 2009). This same process may be successful when working with administrators.

Effective leadership by principals is a key to successful schools, so it would be wise to utilize such leadership to promote technology integration (Marzano, Waters, & McNulty, 2005). Further, providing administrators with technology literate coaches supports their ability to create an embedded technology focus. Combining this focus with other competing principles may lead to a more technology-rich professional development program (Anderson & Becker, 2001; U.S. Department of Education, 2000). Strong instructional leaders

may capitalize on their knowledge of effective teaching strategies, promoting the meaningful utilization of technology to support learning in the classroom.

Technological Pedagogical Content Knowledge

Identifying the Technological Pedagogical Content Knowledge (TPACK) (see Figure 1) of teachers and administrators may be a wise area to investigate when focusing on meaningful technology use in the classroom. Recognizing the strengths and weaknesses of teacher practice, allows coaches to identify and meet the needs of individuals. Once individuals' needs have been identified, the social constructivist theory may be used to facilitate knowledge transfer between staff members (i.e., teacher to teacher, teacher to administrator). Technological Pedagogical Content Knowledge is an extension of Shulman's (1987) model of Pedagogical Content Knowledge (PCK) (Mishra & Koehler, 2006). TPACK links what teachers know about pedagogy and content and adds the element of technology. It is this intersection between the content a teacher is teaching (i.e., math, science, social studies) with what they know about the teaching and learning process, compounded with what they know about technology that supports teaching and learning. When promoting the meaningful use of technology through coaching, designating attention to learners' technological, pedagogical, and content knowledge is sensible.

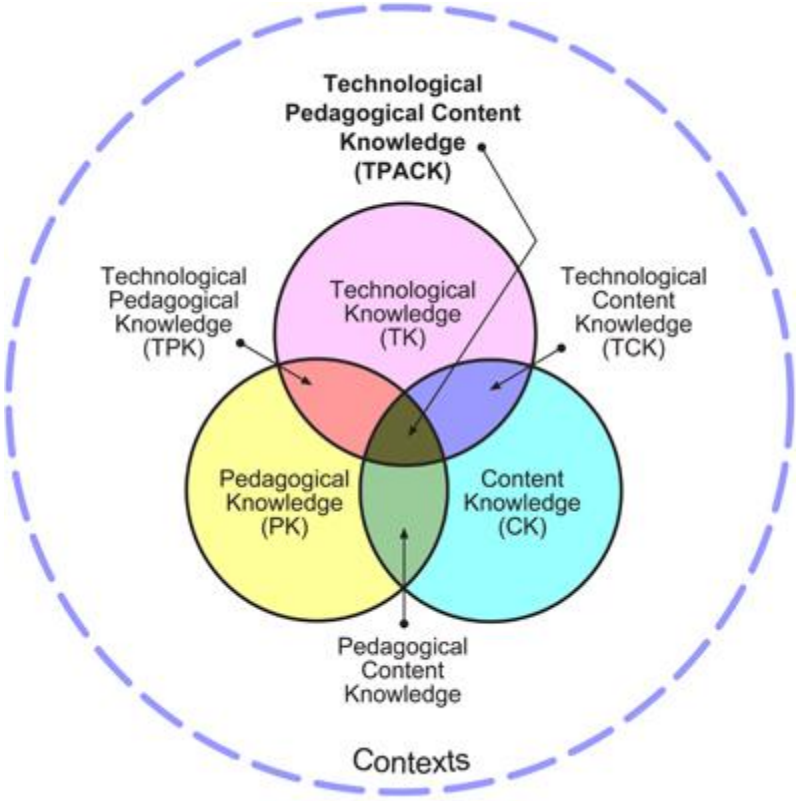

Figure 1

Technological Pedagogical Content Knowledge
From www.TPACK.org. Copyright by Punya Mishra and Matthew Koehler. Reprinted with permission.

As Figure 1 shows, TPACK is a framework integrating the knowledge of content, pedagogy, and technology (Koehler & Mishra, 2005). The focus of this model is on technology integration in relation to content knowledge and pedagogical knowledge. According to Koehler and Mishra, true technology integration demonstrates that educators understand how to negotiate between how to teach, what to teach, and what technological resources will support meaningful learning. The collaboration component of peer coaching provides learners with additional opportunities to develop the ability to navigate and draw upon these

skills. Possessing these skills indicates instructional aptitude that acknowledges a dynamic relationship between content, pedagogy, and technology (Mishra & Koehler, 2006).

Technology itself does not ensure increased academic achievement or meaningful technology integration (Levin & Wadmany, 2006). It is the way educators use technology that produces a change in instruction (Judge, Puckett & Cabuck, 2004). Shifting from knowing how to use a tool to knowing how to incorporate a tool into teaching and applying it relevantly to the content being taught is important (Cochran-Smith & Lytle, 1992; Lieberman, 1995). Peer coaches can model this complex process by collaborating with others to plan instruction and staff development that links the three components: pedagogy, content, and technology. This planning demonstrates the importance of technology, pedagogy, and content and integrates each to provide enhanced learning experiences that promote student engagement, authentic learning, and ultimately success (Murphy, 2007).

Previous Cycles of Action Research

This current study was preceded by three cycles of my research that addressed (a) the impact of positive instruction on students' self-efficacy, (b) the impact of a community of practice on technology teachers, and (c) teachers' perceptions regarding the barriers to technology integration.

Cycle one. In Fall 2008 I embarked on a study researching the impact of positive instruction on students' self-efficacy. This research focused on four students who were struggling to meet academic achievement expectations and fit

in socially. These students often spoke negatively about themselves and their capabilities, appearing to possess low self-efficacy. When asked to describe themselves, one student said, "I'm a screw-up." Another indicated that she frequently thought that she was "No good at all" and that she was "Useless." In an effort to build their self-efficacy, I implemented a number of projects. These projects provided students with opportunities to set goals, create plans to reach their goals, provide gratitude towards others, and expose themselves and their peers to motivational quotes and stories.

Pre and post assessments were conducted to determine changes in students' levels of academic efficacy. Due to the limited nature of this study, measurable results were not obtained; however, informal anecdotal responses suggested students' strengthened levels of self-efficacy after the study and reinforced the value of legitimate praise.

Cycle two. In Spring 2009, my action research focused on the development of a community of practice with technology colleagues across my school district. Feeling isolated as the only technology teacher on campus, not having a support system to call on when questions arose, and knowing that the other technology teachers within the district felt the same, I decided that a community of practice might assist us in professional growth. All technology teachers were invited to meet monthly and discuss problems we were facing as well as potential solutions. This approach was found to increase collaboration and instructional ideas.

Cycle three. In Spring 2010, with school-level administrative permission, I surveyed teachers in my school to determine their perceptions of the barriers to integrating technology in their classrooms and the conditions that would enhance technology integration. This online needs assessment survey was distributed via district email. Survey items assessed teachers' current levels of comfort with technology (2 items), frequency of technology use (1 item), types of technologies used (3 items), and perceptions of barriers that prevent them from integrating technology further (1 item). Open-ended items (e.g., "What would help you integrate learning technologies in the classroom better?") invited a wide range of responses to what hindered and facilitated these teachers' instructional applications of technology.

The results of this survey indicated that the majority of teachers were using technology on a daily basis but felt there was a need for additional on-going training and increased information technology (IT) support. Results from teacher surveys differed from the school administrators' observations noted earlier about limited uses of technology in the classroom. These differing perceptions seemed to be based on viewing technology through different lenses. Administrators identified meaningful technology use as students using technology to learn, while teachers often indicated they themselves were using the technology (i.e., to present information and ideas).

In summary, this review of theoretical and disciplinary literature and the outcomes of my cycles of action research indicate a promising direction for change. Learners perform well in situations that access their background

knowledge, match their zones of proximal development, occur in rich social contexts, and involve inquiry. Professional development efforts embedded in social interactions and centered about peer coaching and Technological Pedagogical Content Knowledge are promising ways to promote the meaningful use of technology in the classroom.

Chapter 3 Design

The following describes the design used in this action research project. It presents the methodology, setting, innovation, data sources and collection, and data analysis used to answer the primary research question framed for this study, What will happen when I promote the meaningful use of instructional technology at Canyon Springs Middle School?

Methodology

This action research primarily followed a case study methodology. According to Merriam (1998), "Case study research is employed to gain an in-depth understanding of a situation and meaning for those involved. The interest is in the process rather than the outcomes, in context rather than a specific variable, in discovery rather than confirmation (p.19).

Miles and Huberman (1994) identify case studies as investigations of a "phenomenon of some sort occurring in a bounded context" (p. 25). When conducting a case study, researchers focus on three key actions: (a) focus on a particular phenomenon, (b) describe the phenomenon in a rich, thick format, and (c) enlighten readers so they understand the full scope of the phenomenon being studied (Merriam, 1998).

After identifying a particular phenomenon of interest, researchers document a thick and rich chronology of the events as they occur. This chronology is an effort to "describe and analyze some entity in qualitative, complex, and comprehensive terms not infrequently as it unfolds over a period of time" (Wilson, 1979, p. 448).

Case study research processes are unstructured and may lead researchers to a number of places in an effort to uncover all aspects that may impact the phenomenon. Researchers investigate the phenomenon, being sure to emphasize, describe, and recreate scenes so readers feel as if they have witnessed phenomenon unfolding before them (Glesne, 1999). Researchers attempt to permit non-researchers to gain insight from the experiences conveyed in case studies by using common language. Readers then can use the insights to make generalizations that can be applied to their own settings in efforts to influence their own practices, organizations, and contexts (Merriam, 1998; Yin, 1994).

This study also followed a mixed-methods methodology. Mixed-methods methodology

> involves the collection or analysis of both quantitative and/or qualitative data in a single study in which data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the research process. (Creswell, Plano, Clark, Gutmann, & Hanson, 2003, p. 212)

Quantitative methods emphasize the systematic assessment of observable behaviors, while qualitative methods permit observers to examine why the behaviors are occurring (Yoder & Symons, 2010).

Integrating mixed methods at different stages of studies allows researchers to address research questions in complex contexts (Greene & Caricelli, 1997). This methodology does not favor one form of analysis over another. In line with recommendations by Greene, Caricelli, and Graham (1989), the specific purposes

of the mixed methods I used in this study were to triangulate (i.e., corroborate trustworthy results from different data sources), develop (i.e., sequentially implement one method to inform the results of another method), and complement (i.e., clarify and elaborate the results of one method with another).

Setting

Site. The innovation occurred in one grade four-to-eight Title 1 school, named Canyon Springs Middle School in this study, that is located in Maricopa County, Arizona. The school enrolls about 832 students, with a population of 85% Hispanic students, 7% White students, 6% African American students, .6% Asian American and 1.4% other students. The school has a highly mobile population. While being a Failing School in first year corrective action according to the federal government, it recently moved to Performing Status with the state of Arizona.

As noted in Chapter One, Canyon Springs' teachers tended to report using technology daily, while administrators have indicated that many of these tools are either not being used or are not used as effectively as they could be. While there has been a drive to purchase technology for teachers within the building, the training component has been lacking. For instance, when SMART Board interactive white boards were installed in the classrooms, teachers received a half-day of training from the organization that installed the boards. This training was geared to the functionality of the board, and minimal time was spent on the software, which allowed teachers to meaningfully integrate technology with their

teaching content. Since that time, the majority of the faculty no longer works at Canyon Springs and no new training has been provided.

Participants. Using convenience sampling (Patton, 2002), study participants included Canyon Springs' twenty-one teachers from 4^{th} -8^{th} grade in a variety of content areas. The teachers in this school ranged from the ages of 23 to 61 years old, with 0 to 30 years of teaching experience. Approximately 75% of the staff taught at the school for less than five years. About 85% of the staff were White, 10% Hispanic, and 5% African American.

Although several teachers in this school met the criteria for study, I selected three teachers to survey and informally asked them if they would be willing to participate. Patton (2002) refers to this process as convenience sampling. These individuals were selected due to their strong sense of self-efficacy, technological pedagogical content knowledge, and interest in meaningful technology integration I had informally observed while working with them as the Canyon Springs' technology teacher. Due to these strengths, these teachers were considered likely to be selected as peer coaches in the future--two members of the focal group were male and one female; their ages ranged from 25 to 30 years old. They taught different subjects as well as different grade levels. Their teaching experience ranged from two to four years. I refer to these teachers as Mr. Lewis, Mr. Jones, and Mrs. Garner.

Along with the Canyon Springs' teachers, the two lead administrators at the school volunteered to participate in the study. One administrator, who for the purpose of this study was called Mrs. Anderson, had been the principal at the

school for five years. Mrs. Anderson was a 35-year old female who previously taught elsewhere in the primary grades and served elsewhere as a coach to teachers prior to becoming an administrator at Canyon Springs. The other administrator, who for the purpose of this study was called Mr. Taylor, had worked at the school for five years and had spent the past three years serving as the assistant principal. Mr. Taylor was a 35-year old male who previously taught social studies to middle school students and served as academic achievement advisor, whose role was to coach teachers in the acquisition of effective instructional strategies, prior to becoming assistant principal. I had informally observed Mrs. Anderson and Mr. Taylor demonstrating vast knowledge of instructional strategies that support student learning.

Finally, I served as a researcher**,** facilitator, and colleague in this study**.** I had been teaching at the school for twelve years. I taught grades four through eight and served as the technology teacher at the time of this study. In addition, I had served as webmaster and technology mentor, worked on past district technology plans, and had made technology purchase recommendations for the school. I earned a Master's degree in Elementary Education with an emphasis in educational technology and a Master's degree in Adult Distance Education. In addition, I conducted professional development sessions on technology integration for my district, private and public universities, and private companies.

While not an official responsibility of my teaching position, teachers and administrators frequently turned to me to trouble-shoot technical issues (i.e., malfunctioning SMART Boards, DVD drives, projectors), provide technology

training, and answer questions associated with technology on our campus. While beyond my official capacity, I tried to help because I believed technology was essential to success in the 21st century. Technology had been an integral part of my personal and professional lives. It allowed me to communicate, learn, and create.

The responsibilities for my roles as researcher, facilitator, and colleague varied. As a researcher, I collected and analyzed study data. The role of facilitator involved reviewing and sharing literature, resources, and knowledge to promote meaningful technology use at the study site. In the role of colleague, I collaborated on past, present, and future technology-related needs of the site. I empathized with other teachers regarding the barriers we faced and shared strategies for overcoming the barriers.

Innovation

My innovation began July 2010 and ended December 2010. It focused on my efforts to help meaningfully integrate technology in Canyon Springs' classrooms. The planned innovation was comprised of two parts (a) my technology coaching sessions with the school administrators and, (b) the administrators' demonstrations of meaningful technology use during staff meetings.

Coaching sessions. My planned coaching sessions with the administrators drew from Peer-Ed's Peer Coaching Program (Peer-Ed, n.d.). My plan was to provide the two school administrators with opportunities to set goals, create an action plan, monitor goal achievement, and adjust as necessary. In

addition, I drew upon my technology experiences and planned to demonstrate various Notebook features. Notebook is the software that is included with SMART interactive white boards. These experiences were designed to build administrators' technological pedagogical content knowledge in an effort to promote meaningful technology use by teachers and students within the school. The coaching sessions were planned to consist of bi-weekly thirty to forty-five minute meetings with the administrators in my technology lab. Ten proposed sessions were devoted to setting goals, creating and implementing a plan of action, assessing goal attainment, reflecting, and repeating the process.

The first coaching session was to begin with goal setting, as illustrated in session one of Peer-Ed's Peer Coaching Program. The administrators, Mrs. Anderson and Mr. Taylor, were to devise a plan for meaningful technology use based on existing levels currently observed on campus. As coach, my intended role was to prompt the administrators to identify how their plan tied into other professional development components already in place on campus and student achievement goals. In addition, 10-15 minutes of explicit instruction showcasing specific features of the SMART Board were to be modeled. Administrators were to select one or two items to implement over a two week period. During subsequent sessions, the plan was for administrators to implement their action plan, assess their commitment level, and determine the extent to which identified goals were achieved. As coach, I intended to help the administrators probe what seemed to be working and what could have been improved. This cyclical process was to continue every two weeks from August through December.

Staff meeting technology demonstrations. The second part of my planned innovation, staff meeting technology demonstrations, were scheduled for the administrators to explicitly encourage Canyon Springs teachers to increase the level of meaningful technology use in their classrooms. The plan was for Mrs. Anderson and Mr. Taylor to incorporate the effective use of interactive whiteboards in ten weekly staff meetings, demonstrating features and instructional benefits that promoted the meaningful use of technology in the teachers' classrooms. My role was to work collaboratively with Mrs. Anderson and Mr. Taylor, helping prepare them for the staff development sessions. See Appendix A for the planned schedule of staff development sessions. Staff development sessions were selected as the forum to demonstrate meaningful technology use as staff meetings generally included the entire Canyon Springs staff. Training during staff development meetings provided administrators with an opportunity to model meaningful technology instruction to all teachers simultaneously. Having the entire staff learning together was meant to provide teachers an opportunity to take advantage of social constructivist learning theory as articulated by Lave and Wenger (1991) and McMahon (1997). In addition, modeling has been shown to be an effective training strategy (Herman, 2002). I purposefully chose to have the administrators facilitate the training in an effort to articulate their technology vision and expectations.

Data Sources and Collection

Nine data sources were planned to assess the meaningful use of technology at Canyon Springs Middle School. Each data collection technique

focused on something different to aid in obtaining a detailed understanding of meaningful technology use at Canyon Springs. The nine data sources included (a) administrator interviews, (b) the Principal's Computer Technology Survey (Brockmeier & Hope, 2002; Brockmeier & Gibson, 2009), (c) coaching conference transcriptions, (d) coaching conference notes, (e) structured observations using the Higher Order Thinking, Engaged Learning, Authentic Learning, Technology Use (H.E.A.T.) protocol (Levels of Innovative Teaching, 2010), (f) field notes, (g) the Technology Integration Matrix (Florida Center for Instructional Technology, 2007), (h) teacher interviews, and (i) a research log. The data collection plan intended for this study is located in Appendix E.

Administrator interviews. In order to gain a detailed understanding of the technology use phenomenon at Canyon Springs, I conducted one-to-one interviews with the Canyon Springs' administrators as suggested by Glense (1999), Merriam (1998), and Patton (2002). The purpose of the administrator interview (see Appendix B) was to identify the needs and gain the perspective of the administrators at Canyon Springs School relative to meaningful uses of technology in the classroom. This interview focused on the personal and professional needs of the administrators in relation to technology supporting the achievement of school goals (i.e., reading achievement, math achievement, and engagement).

Principal's Computer Technology Survey. Surveys help collect data about characteristics, experiences, and opinions (Gall, Borg, & Gall, 1996). In July 2010, the two school administrators completed the Principal's Computer

Technology Survey (PCTS, see Appendix D). The PCTS is a quantitative data collection tool. The survey examined the principal's role in curriculum integration, perceptions of technology use, technology expertise, and professional development needs. This survey was administered a second time in December 2010. The quantitative scores from July 2010 and December 2010 were compared to identify changes.

The PCTS was altered for the purpose of this research study. I added two questions to the PCTS and altered three questions. In addition, the word 'principals' was exchanged with the word 'administrators.' Two questions were added to the Curriculum Integration section. They were "I use the International Society of Educational Technology (ISTE) standards to assist me in facilitating computer technology integration in to classroom instruction," and "I refer to the National Education Technology Plan to inform instructional practices at my school." Question number 16 on the PCTS inquired about the Technology Standards for School Administrators (TSSA). I exchanged TSSA for International Society for Technology Education (ISTE). Question number 25 asked administrators if they accessed the Florida database on technology. I changed this to Arizona's eLearning Platform (IDEAL). Question 38 originally read "I have participated in training designed to develop skills to facilitate teachers' integration of computer technology in the curriculum. This was changed to "I have participated in professional development activities related to becoming a more influential technology leader."

Coaching conference transcriptions. The planned coaching conferences were designed to collect administrative goals regarding technology integration and to monitor progress from the week before. Coaching conferences were scheduled to occur every other Friday. I planned to tape record and transcribe the second, middle, and next to last coaching conferences to ensure accuracy. The planned purpose of this documentation was to provide a narrative record of administrative values in relation to technology integration and to have a record of administrators' implementation progress and setbacks over time. In addition, it was intended to assist me in maintaining a focus throughout the intervention. In August 2010, the anticipated focus of the coaching conference was to create goals. Administrator responses were planned to be revisited twice a month and analyzed at the end of the study to determine whether the goals had been achieved.

Coaching conference notes. Coaching conference notes (see Appendix C) were planned to provide administrators with an opportunity to reflect on the current level of technology integration they witnessed on campus, as well as how they acted as leaders promoting and supporting increased technology integration. Administrators were scheduled to answer questions regarding their successes and concerns in technology integration and to set goals twice a month. I planned to use this data to permit me to assist the administrators in identifying themes in the implementation progress and assist them with achieving their technology goals. The records were intended to allow administrators to track and adjust their behavior according to the goals they set for themselves.

Higher Order Thinking, Engaged Learning, Authentic Learning, Technology Use observations. Ms. Riley, the Technology Integration Specialist (TIS) from a local education agency, conduct walkthrough observations to determine the level of meaningful technology use in all of the classrooms at Canyon Springs School. In an effort to get an accurate snapshot of how technology was being used in the classroom, two dates were selected. Care was taken to avoid district assessments, half-days, and holiday celebrations. These observations were conducted by Ms. Riley, a third party, in an effort to obtain an impartial assessment. The TIS spent four hours conducting walkthroughs of all Canyon Springs' classrooms using the H.E.A.T. protocol in September 2010 and again in December 2010 to assess technology integration in practice. The data collected from the observations in September 2010 were compared to the data collected in December 2010. Data were reviewed to identify changes in meaningful technology use over that period of time.

Field notes. I visited each of the three focal group teachers' classrooms twice between August 2010 and December 2010. During the classroom observations, I took field notes (see Appendix F) documenting the lesson, type of technology integration that was conducted by the teacher, and level of student participation. The purpose of field notes was to document student and teacher technology interaction. Collecting this data allowed me to provide concrete instructional examples of the levels of technology integration. I was able to compare this with the data collected using the H.E.A.T. protocol. Data collected

in were compared to identify changes in teacher and student interactions with technology.

Technology integration matrix. The purpose of the Technology Integration Matrix (TIM) (see Appendix G) was to determine the level of classroom technology integration and the learning environment characteristics in the focal group teachers' classrooms. The TIM was administered twice in each focal group teachers' classroom between August 2010 and December 2010. It was administered at the same time the field notes were taken. The TIM was used in conjunction with the H.E.A.T. This comparison enabled me to identify similarities in the data collected and explore abnormalities.

The TIM, a quantitative data collection tool, was developed by the Florida Center for Instructional Technology at the University of Southern Florida in 2007. The matrix was designed to evaluate levels of technology integration as well as characteristics of the learning environment. Levels of integration included entry, adoption, adaptation, infusion, and transformation. Characteristics of the learning environment assessed included active, collaborative, constructive, authentic, and goal oriented. Each observation resulted in a quantitative score based on the level of integration and learning environment characteristics observed. Due to the limited duration of the study, minimal gains were expected. A positive impact would have been to see teachers increase their meaningful technology integration by one level on the TIM.

Teacher interviews. In order to gain a better understanding of the technology use phenomenon at Canyon Springs, I conducted one-to-one

interviews with three Canyon Springs' teachers following guidelines by Glense (1999), Merriam (1998), and Patton (2002). Semi-structured interviews (see Appendix H) were conducted to identify teachers' perceptions of administrator's vision and communication of expectations in regards to technology on the Canyon Springs campus. Each focal group teacher was interviewed twice between August 2010 and December 2010 to collect data on administrators' technology integration leadership. Data collected from the teacher interviews was compared with data collected from the administrator interviews to portray technology integration from various perspectives. Data from pre-interviews were also compared with data from post-interviews to determine any changes.

Research log. My research log served as a documentation tool in which I documented comments and non-verbal cues made by teachers during the staff meetings as well as during the professional development sessions, in emails, and in passing. I also recorded insights or findings that caused me to adjust the intervention. These notes were compared to the data collected to identify assertions across the data sources.

Data sources inventory. Table 1 displays an inventory of the data collected and analyzed in this study. Consistent with case study investigations, interviews, observations, and my research log contained records of my attempts to collect in-depth data.

Table 1

Data Sources Inventory

Data Source	Description	Contents	Duration
Administrator interviews	A pre and a post interview were conducted with each of the two administrators. One in July 2010 and one in December 2010.	6 one-sided pages	240 Minutes
Principal's Computer Technology Survey	I administered this quantitative data collection tool to each administrator once in July and once in December	42 items	40 minutes
H.E.A.T. observations	Two structured classroom observations by a third-party were conducted with the Canyon Springs staff. Observations were conducted in September 2010 and again in December 2010.	4 one-sided pages	360 minutes
Field notes	Two classroom observations were conducted with each of the three focal group teachers during the months of August through December. The observations varied from 20 to 45 minutes in length.	12 one-sided pages	200 minutes
Technology Integration Matrix	I utilized this quantitative data collection tool in conjunction with the classroom observations during the months of August through December.	6 one-sided pages	NA
Teacher interviews	Two interviews were conducted with each of the three focal group teachers once in August and once in December.	12 one-sided pages	180 Minutes
Researcher log	Documentation tool in which I recorded my observations of the participants. I also recorded insights that caused me to adjust the intervention. This log was kept from July through December.	70 hand-written pages	650 minutes

In line with recommendations by Patton (2002) and Greene (2007), I used the multiple sources of data shown above to generate, cross-check, and validate results. In particular, I utilized a constant comparative method of analysis to generate results (Glaser & Strauss, 1967). Although multiple sources were collected as described earlier, I focused on a few dominant ones and used the others for support and additional insights as Merriam (1998) advises. In this case study, interviews and observations were the dominant data sources, with the others providing further, complementary insights.

The data analysis process of case studies requires data collection, analysis, and reporting to interact with the ongoing innovation, resulting in the continual emergence of insights and possible new actions (Miles & Huberman, 1994). I employed emerging insights to adjust my change efforts during this action research. This approach allowed me to monitor the efforts administrators made to increase the meaningful use of technology and describe these efforts in context.

Finally**,** I conducted member checks after each round of data collection. During the member check conversations, I shared my understanding of the data collected and inquired whether members thought I had written an accurate portrayal of the events as well an appropriate interpretation. Member checks were conducted individually with teachers and administrators regarding findings of teacher interviews, administrator interviews, PCTS, field notes, TIM, and H.E.A.T. observations. As advised by Stake (1995), each participant was provided the opportunity to validate the statements, correct misunderstandings, and check for overall accuracy. These follow-up conversations with each

participant helped ensure that the data were collected in a trustworthy manner and interpreted as the participants intended.

Chapter 4 Results

This chapter reports the results of the study. It is a personal account of what happened when I promoted the meaningful use of instructional technology at Canyon Springs Middle School from May to December 2010. It is a month-by-month chronology of my action research efforts, telling how my planned innovation and data collection procedures played out over the course of the study.

May 2010

As presented earlier, my action research plan centered on the idea that I would serve as a coach to assist the Canyon Springs Middle School administrators in promoting meaningful technology use at our school. Having a passion for technology and having experienced the difficulties associated with integrating technology into classroom instruction, I believed I could provide the administrators with support that would enable them to provide teachers with experiences that would promote meaningful technology use in the classroom. To prepare myself, I read up on the strategies that had demonstrated success (Dawson & Rakes, 2003; Jones, 2001; Kozloski, 2006; Showers & Joyce, 1996). With the suggestion of my mentor, a locally well-known technology integration pioneer, leader, and practitioner, I looked into the Peer Coaching Model sponsored by Microsoft.

While the original Peer Coaching model was designed for teachers coaching teachers, the process appeared suitable to work with administrators. One of the benefits to the Peer Coaching model was that it would allow the administrators to incorporate the meaningful use of technology with other

professional objectives. I would be merely a third-party, providing administrators with accountability and promoting the concept that focused efforts lead to improvement as recommended by Behn (2003).

I saw coaching with the administrators as an ideal way to promote change because it was a flexible process. The Peer Coaching model would allow the administrators to set goals based on the needs of our students and staff and modify these over time as change occurred. Based on the strong, trusting relationship I had with the administrators, I felt like I would be able to have candid conversations with them about what was going well and what could be improved. This relationship was to draw from my expertise with technology and their expertise as instructional leaders.

The Peer Coaching cycle is composed of five stages: assessment, goal setting, preparation, implementation, and reflection. This cyclical process can be modified as organizations change and grow. My plan initiated with collecting data that would identify where we were at, allow administrators to set goals on where they would like to see us in the future, create a plan for getting there, implement the plan, and reflect on whether the plan was working or if it needed to be changed.

My study was designed to collect baseline data via administrator self-assessments and teacher interviews. Using the data collected from the administrators and teachers, along with the school strategic plan and district goals, I planned for the administrators to set technology-related goals for our school. After listening to the identified needs, I planned to support them by acquiring

technology-related resources and serving as liaison, creating a path that would allow administrators to accomplish their goals while providing teachers the support they needed.

A plan was presented on how the school administrators, Mrs. Anderson and Mr. Taylor, could incorporate a small piece of technology into each staff meeting. The next step was to allow me to coach them to be technology integration leaders. They agreed to the plan.

June-July 2010

Much of June and July were spent reading articles, participating in professional development, and brainstorming ideas. I met with Mrs. Anderson and Mr. Taylor at the end of July to revisit the plan.

In the last weeks before school started, we began the first stage of the coaching cycle, assessment. I began with the administrators. While conducting the administrator assessments, scheduling challenges arose. After unsuccessful attempts at scheduling both administrators to be present for the administrator interview at the same time, so that I could ensure they had the singular vision on how technology could support classroom instruction, I found it necessary to meet with them individually. During our initial meeting, I conducted self-assessment interviews with each administrator (see Appendix B). The self-assessments identified the administrators' current vision and leadership associated with meaningful technology use.

Mrs. Anderson and Mr. Taylor indicated that they did not do enough to communicate the importance of meaningful technology use and that the current

use of technology in Canyon Springs' classroom instruction was ineffective. Both indicated that there were competing priorities that overshadowed their interest in technology integration. In regards to one question, Mrs. Anderson said, "I give them tools, but other than that I don't model it [meaningful use of technology] for them. It's not something I focus on. Part of that has been that the need has been so great in other areas" (AINT.A.7-30-10)[2]. Mr. Taylor stated, "I don't do a very good job of that [modeling the use of technology] mostly because morale has been low and I don't want teachers to feel it is one more thing they have to do" (AINT.T.7-29-10). Both administrators indicated they were interested in helping teachers recognize the value of technology. Mrs. Anderson stated, "I think now it really becomes about staff getting feedback about alignment and how they can use technology to check for understanding" (AINT.A.7-30-10).

In my opinion, the administrators' responses indicated that they had a realistic view of technology integration on our campus and recognized the role they played. Their answers were aligned with the responses that I later received

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[2] Parenthetical information specifies data based support for the assertions. The first letter string identifies the data source (AINT=administrator interview; FGINT=focus group interview; AEML=administrator email; ATEXT=administrator text). The second letter string identifies the pseudonym for the participant. The numerals identify the date.

from the teacher interviews. I was pleased to hear the enthusiasm in Mrs. Anderson's and Mr. Taylor's voices and the appreciation they extended to me for helping them provide our school with opportunities for technology integration. I felt that the administrators were both interested in increasing the meaningful use of technology, and I was confident that we were off to a great start. So I set off to get the teachers' perspectives.

August 2010

I approached the three teachers selected to serve as focal group members. They will be known as Mr. Jones, Mr. Lewis, and Mrs. Garner, for the purpose of this study. I believed that these individuals would paint a clear picture of the changes that might occur over the few months. Over the next two weeks, I interviewed the teachers (see Appendix H) documenting their perceptions of the administrators' technology leadership.

The data collected from the teacher interviews indicated that they had views similar to the administration regarding the meaningful use of technology at Canyon Springs. For instance, Mr. Lewis stated,

> Our leaders do not display much of a vision when it comes to technology. While I'm a huge fan of our administrators, I believe they must decide what is important and the implementation and use of new technology is not on their radar. (FGINT.L.8-11-10)

Each of the teachers indicated that they did not know what was expected of them regarding the use of the technology that was put in their rooms. Each one pointed out that a new teacher evaluation rubric included technology under the

facilitation section, but they were apprehensive about being evaluated on technology use because no one had clearly defined how it would be measured. In response to a question regarding how administrators evaluate teachers' abilities to integrate technology, Mrs. Garner said, "They have a rubric. Does that give them the power to deem if technology is being integrated effectively?" (FGINT.G.8-16-10). Mr. Lewis said, "I would like to see trainings for staff and expectations included in the (evaluation) rubric while giving support" (FGINT.L.8-11-10). Each teacher reported that a clear administrative vision did not exist and on the part of both administration and teachers, there was a need for an increased focus on meaningful technology use.

Reality revealed. The concern addressed in the teacher interviews regarding how the new teacher evaluation tool addressed technology was in regard to the following item used to rate teachers' as proficient in meaningfully using technology, "Consistently plans for the use of technology resources (if available) to enhance the learning of objectives." Teachers indicated that they did not know what this statement meant. They felt that it was not addressed adequately in the rubric or by administrators and teachers were unclear on what technology related behaviors administrators expected to see during classroom instruction. They indicated that they would like to have had clarification on the rubric expectations as well as videotaped exemplars of technology being used in meaningful ways that they could have observed. I addressed these concerns with the administrators and I should have realized that we already had a problem

because none of the Canyon Springs' teachers or administrators could clearly define the technology related expectations outlined in the evaluation rubric.

Following the administrator interviews, administrators completed a slightly modified version of the Principal's Computer Technology Survey (PCTS) (Brockmeier & Hope, 2002). I sent an email to the administrators requesting that they complete the survey online or in paper format.

After baseline data were collected using teacher interviews, administrator interviews, and the PCTS, I made an appointment with the administrators to discuss the findings. After reviewing the data, we agreed that we could improve how technology was being used at our school. The administrators were asked to identify specific goals that they would like to accomplish. I provided them with two articles, one on peer coaching by Foltos (2002) and the other on the attributes of effective professional development by Barron et al. (2009). We scheduled another meeting to set goals that would allow us to move into the next stage of the coaching process in which I would prepare materials (i.e., training, training videos, articles, etc.) based on the goals the administrators set. I had planned to coach the administrators in the use of technology that would support their goals allowing them to model the use of technology for teachers during our Tuesday staff meetings.

Potential vision. On Friday, August 20th at a staff in-service, the administrators showed a Vision of K-12 Learning (Nesbitt, 2007). This video emphasized that students wanted increased opportunities to use technology in the classroom and that as educators, we are charged with meeting their needs. The

showing of this video had an emotional impact on me as it felt to me that the administrators finally understood the importance of meaningful technology use and the impact it had on student engagement and motivation. I took their behavior to indicate that they were developing a vision for how technology could support the teachers in the classroom. I was especially pleased as they located this without my assistance. However, during a break in the in-service, the administrators had a discussion regarding whether a connection was made between the video content and the expectations for teachers. If only I had realized that this conversation was indicative of events to come; I now see this discussion as foreshadowing the lack of understanding on the part of the administrators regarding the time and effort required to increase the meaningful use of technology on the Canyon Springs campus.

Collegiality. During the same in-service, Mrs. Anderson wanted to write on the PowerPoint being displayed but could not figure out how. Two teachers immediately began directing the administrator on how to do this. This demonstration seemed to me to be an effective opportunity for teachers to not only learn how to use the tool, but to see it in action and learn how it can be a valuable resource. While the Ink Aware, a tool within SMART Notebook that embeds notes and drawings into the original file, demonstration was not a planned activity, the modeling that occurred was what I was hoping to accomplish with my innovation. I was very pleased with how this played out because I thought that the administrators would need to be seen as collegial technology leaders in order to build a sustainable model of meaningful technology use.

Catching on. During a break, a teacher thanked me for the assistance and training I provided her after school the week before on the Classroom Performance System (CPS) student response systems. She indicated that she used the CPS student response systems all the time now. She noted that, after each assessment, her co-teacher utilized the data gathered to pull students into small groups to re-teach the information and provide additional support to ensure that all students were ready to move on. She indicated that she now used the CPS student response systems daily, and one day, when she was having technical difficulty, she was very concerned because they had become such an integral part of her instruction that she did not know how to function without the CPS student response systems. In my opinion, this teacher was using technology in a way that was meaningful. Using the CPS student response systems, the teacher was able to immediately assess students' knowledge and adjust instruction to meet their needs.

Overhearing the teacher and me discussing how beneficial the student response systems had been in her classroom, four other teachers asked about checking out the CPS student response systems and meeting with me for training. This echoed the statements made by the focal group teachers, who indicated they needed and wanted training on how to meaningfully incorporate technology into their classrooms. These one-on-one trainings appeared to be a viable way to support teachers in their quest to meaningfully use technology. Conducting one-on-one trainings in the teacher's classroom appeared to promote a level of comfort that made it easier for teachers to change their instructional practices to include the meaningful use of technology.

Delayed progress. On Thursday, August 26th, I sent a second request to the administrators regarding setting up the coaching conversations. And on Tuesday, August 31st, I sent a third notice requesting dates for coaching conferences. The secretary who was in charge of scheduling these meetings informed me that they would not be scheduled until Friday, September 3rd, due to a backlog of issues related to the new student reporting system. This delay was beginning to become a pattern.

The following is an excerpt from an email sent to Mrs. Anderson and Mr. Taylor on Thursday, August 26th, and again on Tuesday, August 31st:

> I just wanted to check in with you to confirm dates for us to meet this semester regarding the coaching conferences I will be doing as part of my dissertation. All of the baseline data will be collected by next Friday (September 3), so I would like to begin the following week, if possible. Last year, we talked about conducting the coaching conferences on Mondays so that I can best support you with technology suggestions/ideas/training/etc. for the Tuesday staff meetings. I imagine the first conference may take us about an hour or so and subsequent meetings should require about half an hour. My thought was that after you set your goals and share with me your staff meeting agenda, I can suggest ideas for how you can marry your staff meeting agenda with your technology goals.

> Since the goal of this study is for me to investigate whether or not I can coach you to be technology integration leaders my purpose would be work with you on how you can accomplish your goals and integrate technology as a model for the teachers. (AEML.A&T.8-26-10)

In addition, I provided administrators with a copy of some of the data collection materials that I had planned to use over the course of the study. These included the coaching conference questions, and H.E.A.T. assessment, as well as Chapters 1 through 3 of my dissertation and the approved IRB paperwork. I also reminded them that I would be meeting with the superintendent to find out what his thoughts were regarding my dissertation and how it could support his goals for teachers' technology uses in the district.

I received no response.

September 2010

Bumping up against reality. Despite the lack of administrators' technology goals, I continued to collect data on the technology integration that was happening in the classrooms. I knew the administrators were busy, and I assumed they just needed more time to mull over what direction they wanted to take regarding technology integration. I was not worried, because the administrators previously had told me they were excited about what my study had to offer our campus.

Mrs. Riley, a technology integration specialist (TIS) representing a local educational service agency, was scheduled to conduct the H.E.A.T. observation

regarding technology uses in classrooms on Friday, September 3rd. The H.E.A.T. observation provided a third perspective and limited potential bias that might have arisen from me being the only person conducting observations.

Since the observation was not part of the school's mandated requirements, it was necessary for me to seek teacher consent. Many teachers were aware of my study, and I did not anticipate that obtaining their consent would be problematic since the results would be anonymous. My plan was to distribute the consent forms at the staff meeting afterschool, explaining to the teachers that the H.E.A.T. protocol was a data collection tool designed to gather baseline data on how much and what kind of technology integration was happening in our school. Although the consent forms detailed that the results would be anonymous, and the data would help me determine the effectiveness of my work with the administrators I planned to explain this in person at the staff meeting, so that I could answer any questions teachers might have had. I distributed the forms before the meeting, but due to my commitment to meet with the superintendent, I was forced to leave prior to having an opportunity to explain the forms to the teachers. I emailed the teachers that evening apologizing for not explaining the forms during the meeting and asked if they had any questions. No one responded with questions and I received signed consent forms from almost all of the teachers. Teachers who were absent submitted their consent forms when they returned to school the following Monday. I appreciated knowing that I had the support of the Canyon Springs faculty.

On September 3, 2010, Ms. Riley arrived. I provided her with a list of classrooms from which I had received teacher consents to be observed. The H.E.A.T. findings (see Appendix I) supported what both teachers and administrators had reported. Teachers indicated that they were using technology, while administrators indicated that teachers were not integrating technology in meaningful ways. The H.E.A.T. results indicated practically no meaningful integration of technology was occurring in the classroom. The results showed that teachers were using technology to present information to students (i.e., video clips, websites, PowerPoints, etc.); however, for the most part, students were not using the technology. The twenty-one H.E.A.T. walkthroughs indicated the following:

- 62% of the teachers' lessons were at the remember and understand level
- 52% of the classrooms had all students engaged in the same teacher designed task
- 67% of the classrooms were completing tasks that were relevant only to the instructional objective (i.e., worksheets)
- 10% of the classrooms had students using technology to acquire or create ideas and information

Results of these observations suggested that teachers were not using technology in meaningful ways. I scheduled a meeting for Ms. Riley to return to Canyon Springs and present the data to the administrators on September 30th.

Falling further behind. Friday, September 10th, was our first scheduled bi-weekly coaching meeting with the administrators. The anticipated agenda was to establish technology goals which would allow me to begin coaching the administrators to integrate technology in meaningful ways at our school.

Administrators had not yet set technology goals for the year. Mrs. Anderson indicated that she did not know what the district technology plan was and that the district Local Education Agency Improvement Plan included very little information about technology. I told her I would investigate the role technology was to play in the district's Local Education Agency Improvement Plan. I also mentioned that the teachers were unsure of the vision the administrators had regarding technology, and I indicated that the teachers told me that they wanted training, concrete expectations, support, and access to resources of their choosing.

After the meeting, I contacted a district administrator who was involved in technology asking him about the technology plan. He indicated that it was embedded in the district's Local Education Agency Plan, the district's design for improvement that is submitted annually to the state, and that he would send the most current version of the plan back to me. I sent the following email to the administrators on September 16, 2010:

> Would Thursday 9/30 at 11:30 work to meet with the technology integration specialist from the state? By then we should know what our long-term technology goals are. We are scheduled to meet tomorrow morning to talk about them. By the way, I emailed the district technology

> director what we had found and he said, "This looks like the old stuff that had to make it in for last year. There is a ton this year. I will check and see why it is not there and send you a copy." Do you have the most recent copy of the LEA? Thanks. (AEML.A.9-16-10)

After waiting a week for the most recent copy of the LEA, I contacted another district administrator and received it the next day. After searching through the 112 page document, I identified technology related pieces that related to this action research. These included:

> Encourage innovation by providing opportunities for teachers to share ideas and examples across grade levels, and PLC meetings.
>
> Implementation of classroom response systems, document cameras, and interactive whiteboards in student centered curriculum activities.
>
> Incorporate technology into all curricular adoptions, and supplemental resource purchases.

I highlighted these and other technology related items and sent the marked document to Mrs. Anderson so she could evaluate and make links between the technology needs of our school and the technology needs of the district. She indicated that she would get back to me with her goals.

On Friday, September 24th, I provided the administrators with research on preparing teachers to use technology meaningfully (Jones, 2001). The administrators expressed appreciation for these but no goals were set. Mrs. Anderson indicated she wanted more time to review through the Local Education Agency Improvement Plan and align the technology goals with the rest of the

goals in the Arizona School Improvement Plan. Mr. Taylor asked me to create SMART Notebook image die including each of the teachers' pictures for the Tuesday staff meeting. I used the SMART Notebook die icon, a multimedia tool, which could be manipulated to insert images such as teachers' pictures. The administrator had planned to use the dice to randomly call on individual teachers. This high-tech imagery and check for understanding example would replace the low-tech version of pulling a popsicle stick to gauge understanding. The administrator could then ask the indicated teacher a question to assess comprehension about a topic he discussed in the meeting. Since this was short notice, he asked if I would have enough time to make the dice. I said, with the help of a student photographing the teachers for me, I would.

On Monday and Tuesday, I had a student take pictures of all the teachers on campus. On Tuesday, using the SMART Board interactive image dice template, I created six dice that included all the teachers' pictures. The image dice was completed and placed in the shared computer Dropbox created by Mr. Taylor under a folder that I created called Notebook Resources. Since this resource was created just before the meeting was to begin, and I knew I would arrive late to the meeting due to other school responsibilities, I sent a text message to Mr. Taylor indicating that the dice were ready for him to use and the location of the file. I received no response, and the dice were not used at the staff meeting. Mr. Taylor and I later discussed that the use of the dice would not have demonstrated the meaningful use of technology that we wanted to cultivate. The administrators and I wanted to model the use of technology in ways that would

meaningfully impact student learning rather than just use technology for the sake of using technology.

No clear vision. At an unscheduled meeting with Mr. Taylor, we again discussed identifying the difference between proficient and exceeds on the teacher evaluation rubric relative to technology integration. I reminded him that several teachers had indicated that they would like clear expectations and models of technology integration that met proficient and exceeds ratings on the teacher evaluation rubric. According to the rubric, a teacher would score proficient if they "consistently plan for the use of technology resources (if available) to enhance the learning of the objective." On the other hand, a teacher would score exceeds if they did the following:

> Adapt and create a wide range of relevant, highly aligned instructional materials and technologies to facilitate, extend, and enrich student learning and achievement that is equally accessible for all students. Materials and technology tools may be self-selected or adapted by students. Integrate technology in the teaching AND the learning process for maximum student learning.

Mr. Taylor and I briefly brainstormed that proficient might be demonstrated if students were using CPS student response systems during a lesson, while exceeds might be demonstrated if students were conducting research via the internet. While this was a valuable conversation, this information was not shared with staff. To my mind communicating an observable measure of each evaluation rubric rating would have been an opportunity for administrators to

share their expectations and communicate their vision of meaningful technology use.

Implementation woes. On Friday, September 24th, just prior to report cards being distributed to students and parents, district administration had the achievement advisor hold a mandatory training regarding the new student information system. During this training, teachers sat at tables and watched as the achievement advisor clicked through screen shots of how to enter grades into the system. Teachers were provided with a paper handout describing the steps required to complete the report cards. The actual program was not used and no hands-on training was provided. In fact, this new system had been implemented within the district without a pilot and teachers had not received formal training prior to the implementation. This seemed to me to be a good example of what the teachers had experienced with other technology resources that had been provided by the school and district in the past. While some technology trainings had been provided by the district, they had not been well advertised, leaving many teachers unaware of the opportunities available to them.

I wondered if this was a sign of future problems with technology integration. If the district was not prepared to implement a new software program that impacted the classroom to district office levels, perhaps they did not realize the value of communicating a clear vision for how technology should be used in the classroom or that training on these resources was vital to their meaningful use.

Under pressure. At this point, the administrators and I were two months into this action research study, and no short term or long term goals relative to

technology integration, the focus of this study, had been set. It seemed as if there was not enough time in the day to accomplish all the work that had to be done. Teachers and administrators alike were overwhelmed.

I sent out an email on September 27, 2010 reminding Mrs. Anderson and Mr. Taylor that Ms. Riley would be meeting with us on September 30, 2010 to present her H.E.A.T. classroom observation findings. On September 30, 2010, a meeting was held with Mrs. Anderson, the school turn-around consultant, Ms. Riley, and me. Mr. Taylor was originally scheduled to attend but was unable to due to a meeting with a parent. During this meeting, Ms. Riley shared the H.E.A.T. results with Mrs. Anderson and turn-around consultant. We discussed a need for the school to move away from teaching skills and approach teaching higher level, critical thinking and how technology could support that goal. Mrs. Anderson indicated that one of the goals was to raise the rigor and relevance of the school's curriculum. Ms. Riley indicated that the SMART Boards could be used to do this through simulations. Mrs. Anderson noted that the Canyon Springs' teachers had not been provided with training, which would have helped them understand how SMART Boards could support instruction. Mrs. Anderson said, "it's [using SMART Boards simulations] a missing piece that would boost engagement" (AINT.A.9-30-10). Ms. Riley added that she could provide our staff with training that demonstrated how technology resources could be used to increase engagement, authenticity, and higher order thinking.

Mrs. Anderson added that the strategic plan for our school included aligning objectives, focusing on unit outcomes (i.e., analyze, create, defend), and

following the process of Understanding by Design (UbD) which focuses on improving student achievement through clarified goals, revealing assessments, and activities that are engaging and effective. Ms. Riley informed Mrs. Anderson that she could customize training that would meet the needs of our school so that teachers would not feel like we were adding one more responsibility to their already full plate. Rather, we would be providing them with training that would incorporate all of the necessary components into one professional development. Mrs. Anderson requested that Ms. Riley provide her with a list of trainings so she could get ideas of what is available and tweak them based on the needs of our staff. Ms. Riley provided examples, and Mrs. Anderson said that she would have a better idea after the fall break.

Because we were already almost halfway through this action research study without having any goals set, I was concerned about this delay as Fall break would put us halfway through October. Thus, I requested that we set up a time to meet so that we could move forward. We set up a meeting to select and schedule the teacher training Ms. Riley had discussed for Tuesday, October 26th. The pressure of making successful progress in regards to the meaningful use of technology on the Canyon Springs campus was building and I felt a strong need to ensure that students were being engaged and motivated by the technology they used outside of school and that the funds that had been spent on technology were being utilized to engage students in meaningful learning.

October 2010

Veering off course. On October 1, 2010, I had my third bi-weekly coaching meeting with the administrators. The action research plan indicated that we should have been in the process of implementing steps to reach the administrators' goals, reflecting on their progress, and making adjustments to the goals as needed.

When I arrived to the meeting, Mr. Taylor indicated that he could not meet that morning because he had a parent meeting. While disappointing, interruptions and rescheduling of meetings were a daily reality educators often face. Mrs. Anderson had not yet arrived. Knowing that we were behind schedule, I became very anxious. When Mrs. Anderson arrived, I shared my feelings of frustration with her. While no progress was made regarding goal setting, Mrs. Anderson said she felt we should start working with teachers who were instructionally ready. She said, "We could identify teachers who exhibit two sub skills (a) solid instruction and (b) ready to be pushed with critical thinking" (AINT.A.10-1-10). She also informed me that she and Mr. Taylor would be finished with Canyon Springs' strategic plan (i.e., the school's design for improvement that aligns with the district's improvement plan) that day and she would have a better idea of how she wanted to proceed.

I was a little disappointed as it did not sound like the administrators were going to be the leaders in this endeavor as I had hoped. It sounded like I was going to be in charge. While I enjoyed professional development with teachers, my concern was sustainability of teachers' technology integration. Without direct

administrative leadership, I was concerned that the teachers would not see the administrators having a long-term vision for technology integration and would remain in the dark about the expectations for meaningful technology integration at Canyon Springs.

Change complexities. I met with my dissertation committee on Monday, October 4th. I shared the status of my innovation, and we discussed the challenges associated with school change. We talked about the competing priorities faced by all educators. We also considered the special tensions in my school district in general and Canyon Springs School in particular. My district had gone without a superintendent for two months over the summer, and, at the end of July, a new superintendent had been hired. At a principals' meeting in September, the new superintendent instructed the principals to lighten up on the teachers by relieving them of responsibilities or being more flexible with due dates. Due to the pressure on our school to meet the No Child Left Behind Act of 2001's (n.d.) requirements for Adequate Yearly Progress (AYP) so we could get out of corrective action, easing up was not seen as a viable option by the Canyon Springs' administrators. As a result, it was becoming clear to me that what started out as a promising technology integration innovation now had become less prominent than other pressing instructional issues.

Redirected efforts. On October 8th, before fall break, I spoke with Mr. Taylor about the progress of the study, specifically regarding the lack of movement toward technology goal setting. He agreed that we were not moving forward. He expressed disappointment with our progress and made an executive

decision to set goals without Mrs. Anderson's input. Before setting the goals, we reviewed the items on the district's evaluation rubric. We then identified professional development that would allow teachers to demonstrate meaningful technology use as indentified on the teacher evaluation rubric. Mr. Taylor indicated that he would like to see teachers use instructional software and Web 2.0 resources, incorporate interactive SMART Boards lessons, and have teacher web pages that were regularly updated.

Mr. Taylor set two goals. The first goal was to increase the effective use of technology in the classroom. To reach this goal, Mr. Taylor decided that he and I would plan, design, and execute three separate technology workshops to be held after school or on Saturday. The professional development sessions would be held once a month to promote the effective use of current technology available on our campus. The technological tools that Mr. Taylor and I identified as being the most meaningful were (a) SMART Notebook, (b) CPS student response remotes, (c) Study Island and Dropbox.

The second goal was to increase parent, student, and teacher communication. To reach this goal, we would identify, plan, design, and execute training for teachers to design and produce teacher web pages to keep parents up to date on what was happening in the classroom (e.g., class events, homework, tips for parents).

Mr. Taylor asked me to email these goals and plans to him and Mrs. Anderson. As requested, I sent the email. But like before, I did not receive a response or further instructions on how the administrators wanted to proceed.

Having received no response after sending three emails regarding the goals Mr. Taylor set before break, I decided to approach him in person to see if there had been a change of plans. He acknowledged that Mrs. Anderson was having some difficulties, and that they had spoken about the challenges we were facing instructionally. The administrators were concerned about the weaknesses that had been identified during classroom observations and what that meant in regards to technology. Mrs. Anderson said, "When there is no modeling or sub-objectives, technology becomes a distraction rather than a tool to support learning" (AINT.A.10-27-10).

Mr. Taylor said that I could proceed with what I was trying to do. But again, this raised a red flag. I took this to mean that the administrators were not going to be involved in fostering the meaningful use of technology at Canyon Springs. I imagined it was just too much time for them to invest, that they knew it was a valuable endeavor, so they wanted me to proceed however I saw fit.

On October 26, 2010, a third meeting with Ms. Riley (TIS), the administrators, and me was held. Mrs. Anderson began the meeting by reviewing her observations of SMART Board use along with comprehensive literacy and balanced math instruction. She indicated that there was an expectation for teachers to participate in direct instruction for a designated portion of the 80-minute math and literacy blocks and that there was a need to connect technology with literacy and math so that it did not become an add-on. Mrs. Anderson indicated that she had witnessed the SMART Boards being used by teachers as tools for presenting information and that students were not really involved in their

use. One of the main concerns that Mrs. Anderson identified was that the teacher technology training needed to be connected to our current focus on alignment, unit outcomes, and engagement so that it would meaningfully enhance the instructional process. She indicated that she could envision teachers' uses of the SMART Board hitting four specific areas on the teacher evaluation rubric under engagement, (a) function and formation of groups, (b) interactive language development, (c) critical thinking, and (d) active participation.

Mrs. Anderson said that it would be beneficial to differentiate the training into two groups. She stated, "Some teachers are still struggling with the facilitation process. They have no clear objective and no guided practice. Their instruction is not aligned and there is no clear modeling. For these individuals, technology isn't even on the radar yet" (AINT.A.10-26-10). Mr. Taylor included, "We would not want to push those teachers there (increased technology integration) yet" (AINT.T.10-26-10). Mrs. Anderson continued,

> Other teachers are not accommodating and modifying. Students are not working in small groups, their active participation is low, and students are not working at a level of critical thinking. These are the teachers we want to target [for engagement]. This [SMART Board training] will help get most of their kids engaged most of the time and provide skills for critical thinking. (AINT.A.10-26-10)

Ms. Riley identified two trainings that met the needs identified by Mrs. Anderson. The first training would be SMART Basics, which targeted teachers struggling with the facilitation process. This training would provide them with

the basics of what tools are available on the SMART Board. The second training would target teachers working to increase student engagement. This training would center on Higher Order Thinking (HOT) skills.

After defining the two trainings, the issue of time was raised. Mrs. Anderson inquired about how much time the trainings would take. Ms. Riley indicated two hours. This was met by a long silence in which Mrs. Anderson appeared to be thinking about where she could get the time. Ms. Riley appeared to sense this struggle for time and said, "I could do an hour with small groups as long as I have a full sixty minutes of teacher attention" (AINT.R.10-26-10). Ms. Riley also suggested that there be three different trainings, with the third training being a Train the Trainer model. Trainings would be held at the same time with the teachers being allowed to choose their session, or the administration could direct them to attend a specific training thought to best match their instructional readiness. However, Mrs. Anderson was still struggling with concerns about time. She began processing aloud, "What time do I have available? I either have to give up a staff meeting or…[trailed off and did not finish the thought] but if it's a priority, I think teachers would be interested" (AINT.A.10-26-10).

Ms. Riley suggested the option of webinars, but Mrs. Anderson and I both stated that the majority of the staff was not ready for that type of professional development. Mrs. Anderson indicated that we would not be able to realistically have the training until after the New Year due to the holidays between November and December. At this point, I interjected my support for extending the administrators' and my efforts to increase the meaningful use of technology

beyond designated time of my study but noted that my action research would be over in December. In an effort to resolve the issue, Ms. Riley inquired into starting with the Train the Trainer model using the STEM (Science, Technology, Engineering, and Math) committee. She put it this way, "That would be a great place to start. As it would allow a support system to be put in place before the other teachers were trained" (AINT.R.10-26-10). I liked this idea as it would provide Canyon Springs with an opportunity to create a cadre of teachers who could work together to sustain the meaningful use of technology and support one another in their efforts. Mrs. Anderson demonstrated her support for this idea by allowing us to modify the date for the STEM meeting so that we could accommodate Ms. Riley's availability. No other trainings were scheduled.

Ms. Riley indicated she could have a Train the Trainers SMART training for the STEM committee on Thursday, November 4, 2010. I contacted the rest of the group to see if that date would work for them. They agreed, and I sent out a calendar invite to them as well as a list of non-STEM committee members that Mr. Taylor felt had the instructional skill set to succeed with technology integration.

I sent an email on October 26, 2010 inviting the Canyon Springs administrators to the training as I felt that it would benefit the faculty three ways: (a) administrators would gain an understanding of what was involved in the creation of lessons, (b) it would send a message to the staff regarding the value of technology, and (c) administrators could verify that the training was aligned with

the school goals. In addition, I asked the administrators to give input on the professional development Mr. Taylor had indicated that he wanted to see.

November 2010

I did not receive an immediate response from Mrs. Anderson or Mr. Taylor to my invitation for them to attend the faculty training. In a meeting with Mr. Taylor on November 2nd, he indicated that he would be leaving to go out of town the evening of November 4th so he would not be able to attend the training. Mr. Taylor did not address the professional development goals he had originally proposed.

On November 4, 2010, five of the 14 individuals who were invited attended the Train the Trainer professional development facilitated by Ms. Riley. Ms. Riley provided a dynamic professional development session in which each teacher was an active participant. Questions were raised in connection with making the SMART Board lessons fit the district's lesson plan guidelines so that the evaluation requirements were met. Teachers seemed overwhelmed with their current workloads, so I inquired about how we could make the SMART Board lessons less overwhelming for teachers. Each participant indicated that they were interested in attending future trainings using SMART Boards. The following items were requested for follow up sessions: (a) model integration identifying the facilitation and management process, (b) provide examples or model the incorporation of difficult content, and (c) model examples of higher grade level subject matter.

My "a-ha" moment. On November 2, 2010, I had my annual teaching observation post-conference which had followed Mr. Lewis' observation of my lesson during which he informed me that he wanted me to focus on the basics of typing and the Microsoft Office Suite products, Word, PowerPoint, and Excel. He wanted me to teach the features of these programs. While I understood the need for Microsoft skills, I was troubled with the way he wanted me to teach them. He asked me to teach the features of the programs to my students in isolation rather than project-based. I left this conference stunned.

I felt as though I were on an island. I had been trying to work with other teachers collaborating to find ways in which I could support their work in the classroom while teaching students technology skills that would prepare them for their future. The news that my classroom instruction should be focused on the chosen program rather than teaching students the program by supporting content from the other classes was devastating. How were students to learn the application and power of the program when it was taught in isolation?

I spent the day pondering my situation, wondering if I were in the wrong position. Had I chosen the technology position so that I could teach technology, or had I chosen the technology position so that I could teach with technology? Much of what I know about instructional technology had been acquired during my M.Ed. program. Coursework had been specifically geared to how we educators could use the technology tools with students; it was not focused on the tools, themselves. As I acquired my technology skills, I figured out ways that I could

incorporate these skills into my instruction. I found ways to use the technology tools with my students to engage them in the learning process.

I thought that perhaps my vision of my position as technology teacher was not aligned with the vision my administrators had -- perhaps this was why my administrators were struggling with integrating technology into their professional development plan. I thought I finally understood why the administrators were having difficulties setting goals for technology integration. I began to wonder if the difficulty associated with integrating technology was due to the time educators spent using technology for teaching and learning as well as personal comfort levels with technology. Maybe the competing priorities that administrators faced presented critical difficulties. Perhaps it was a combination of these. I thought more about this over the weeks to come.

As a classroom teacher, my day was spent interacting with students. Consequently, I found that my priority was to engage them in the learning process and motivate them to learn. Presenting the features of technology programs in isolation was not something I could imagine myself doing, so teaching this way was going to be a serious challenge. I wanted to please my administrator though. I highly respected his input and had learned a lot from him over the years.

Recharge. On November 6, 2010, I drove to Flagstaff with one of my mentors to attend Arizona's Technology Education Alliance's (AzTEA) Shift Up Conference. This conference focused on the development of peer coaching. Les Foltos, the keynote speaker, spoke about the research conducted by Fullan, Darling Hammond, and Elmore regarding what education is about, students and

improving teaching and learning. He reminded us that testing and technology are not what improve learning, good instruction improves learning. He focused on the idea of building relationships. Through collaborative relationships, educators can facilitate teacher growth.

After spending the day in Flagstaff with the Arizona Peer Coaching community, another realization hit me. What if we looked at our greatest gaps in student learning and developed resources integrated with the meaningful use of technology to fill those gaps?

Upon returning to Phoenix, I set off to locate our AIMS scores in the hope of identifying our school's weakest area. I planned to create lessons that could be used as a resource to meet the needs of my administrators and colleagues and that demonstrated the meaningful use of technology. After searching the Arizona Department of Education's website without success, I decided to email my administrator. Mrs. Anderson replied, indicating that the information I was searching for was at school and she would email it to me Monday. I stopped by her office on my way out Monday. She was in a meeting with one of my colleagues, but handed me some information that I could barely understand. She indicated she would email me more specific information later. She also noted that the state no longer organized data in a clear and useable format. Now we had to do it ourselves. I did not receive this information and feeling that perhaps it was a feat too great to accomplish at this time, I decided to focus on a more manageable task that teachers had been asking for, SMART Board training. I developed the training and sent an email to teachers letting them know the dates and times.

District input. After pondering what I had learned at the Shift Up conference as well as the conversations I had with school administrators regarding the teacher evaluation rubric and my personal teacher evaluation, I decided to email a district administrator to seek clarification regarding the district's vision of meaningful technology use. I received a response from the district administrator which indicated that there was a team refining the evaluation rubric further. In regards to the district's vision of meaningful technology use she indicated that she would have another representative contact me with district's vision. I was a little surprised by the revelation that the district administrator could not articulate the district's vision on how technology should be used meaningfully in the classroom. In my opinion, the inability to communicate the district's vision of meaningful technology use indicated that either no vision had been formed or that it had not been clearly communicated to all district level administrators.

December 2010

District vision. At the beginning of December, other teachers in the district brought the district's vision of meaningful technology use into question. These concerns were addressed by another district administrator. His correspondence indicated that our focus should be on emerging technologies and innovation in the classroom. His vision of meaningful technology use involved high level project-based learning that integrated meaningful technology-use across core subject areas. He indicated that teachers should not be teaching isolated topics or products, instead technology should be integrated with core curriculum in ways that were exciting to students. He specifically addressed the

use of Microsoft Office products indicating that these tools are not what students need for the 21st century work environment. Instead we should be promoting student creativity and inventiveness. This was interesting as it directly conflicted with the directives conveyed by my school administrator, again making me question if a district vision had been clearly communicated to school administrators. In my mind, the lack of a clearly communicated district technology vision could have contributed to the reason why Canyon Springs' administrators were having difficulty following through with my innovation.

SMART board professional development. Over the course of the semester, teachers had repeatedly expressed their desire for technology training and one of the goals set in October by Mr. Taylor was to provide the teachers with SMART Board training. Unfortunately the planning that we had discussed at that time never progressed further than that conversation despite my attempts to move ahead. Wanting to promote meaningful technology use on the Canyon Springs campus, concerned with the dwindling time left in my action research study, I proceeded to host trainings on my own.

I held three trainings on SMART Notebook software for teachers in the morning before school as follows:

- SMART Your Instruction: Incorporate Pre-created Lessons to Engage Students
- SMART Your Instruction: Use Shapes, Colors, and Animations
- SMART Your Instruction: Make Up Work the Easy Way

Only one teacher attended the first training. This teacher happened to be one of the focal group teachers, Mr. Jones. He reported being excited about the features he learned but he added that he was pressed for time so he did not think he would be able to attend the other two trainings. No one attended the second or third trainings.

Since teachers had requested this type of training in particular, I decided to investigate why only one attended. One fourth grade teacher and three seventh grade teachers reported that they wanted to attend the trainings but were unable to come at the scheduled time. They indicated that they were so overwhelmed with other obligations that they were too exhausted to attend, especially considering that the trainings were held before school started. They said they really wanted to attend the trainings and they requested that I host them again at a different time. I informed the teachers that I would be more than happy hold the trainings again in the Spring and that I would have morning and afternoon trainings to meet the needs of teachers who came early, as well as those who preferred to stay late. Although I want to provide teachers with training opportunities, I wondered if teachers would be any more likely to attend, as it was unlikely that they would be less overwhelmed in the Spring.

The post interviews and assessments. One of the data collection methods that I set out for this action research involved interviews with the teachers and administrators who were involved in this action research. My December 2010 post interviews with the focal group teachers produced several results. According to focal group teachers, one of the dominant reasons for the

ineffective use of technology in the classroom was the lack of time for training. Mr. Lewis said,

> I do not get the training I need. If I want to use my extra [personal] time, I'm sure I could get the training but it's not a valuable use of my time. While I'm sure it would help [my instruction] right now when I have to choose between making thirty dollars working a second job or make zero dollar sitting in a training, I choose thirty dollars. (FGINT.L.12-13-10)

Mr. Lewis was asked about district technology training opportunities. He indicated that all of his trainings were selected for him. In my mind this was consistent with what had happened when administrators tried to implement the innovation. There was just not enough time to address all of the needs of the Canyon Springs' teachers; therefore, Mrs. Anderson and Mr. Taylor were forced to prioritize, and the meaningful use of technology did not come at the top of their list of priorities.

Prioritization came up throughout the administrator interviews. Mr. Taylor and Mrs. Anderson were both asked how we were going to improve teachers' technology use. One of Mr. Taylor's responses demonstrated that meaningful use of technology was not currently a priority. He said,

> Teachers needed examples of technology being used effectively and that it has to be of grave importance to administrators. It has to be something that we believe is going to make a difference with test scores. The bottom line on why this [promoting the meaningful use of technology] is also a

con is that we still have teachers who cannot write an objective or breakdown a task analysis. (AINT.T.12-16-10)

Since time is always limited, I inquired of both the focal group teachers and the administrators about training with embedded technology. Mr. Lewis indicated that professional development trainings should incorporate the use of technology. Mr. Jones stated that the district does "an awful, brutal" (FGINT.J.12-15-10) job at integrating the technology tools they provide in professional development trainings. He went on to say, "Achievement advisors encourage teachers to model for students yet they never model for us" (FGINT.J.12-15-10). Administrators were asked if meaningful technology use could be wrapped into current professional development trainings. Mr. Taylor responded with a succinct, "No" (AINT.T.12-16-10).

The teachers reported that the administrators were highly ineffective at helping faculty fully understand the school or district's vision for technology. The teachers further reported that despite meaningful technology use being included on the new evaluation rubric, there was no change. I asked, focal group teachers how technology use was addressed during the teacher evaluation post conference. All of the teachers indicated that it was not. Mr. Lewis said, "No, I am certain that if they did they breezed through it" (FGINT.L.12-13-10). Mr. Jones reiterated this sentiment by stating, "If it was addressed, I'm sure it was rushed over. Nothing specific was addressed" (FGINT.J.12-15-10).

In December 2010, follow-up interviews were held with the two Canyon Springs' administrators. These interviews indicated that teachers used technology

for presenting information rather than engaging students in the use of technology for learning. One administrator revealed that of the teachers she evaluated no teachers received exceeds on the teacher evaluation rubric. She indicated that the teachers she observed used technology in the following ways: (a) video clips to provide background information, (b) document cameras to track thinking, (c) virtual math manipulatives, and (d) CPS remotes to monitor and adjust student learning (AINT.A.12-17-10).

Mr. Taylor said, "I have seen lessons where teachers have used technology for presenting information but I have not seen a teacher allow the student to use the technology, which in my opinion is what an effective lesson would do, have the student use technology for their own learning" (AINT.T.12-16-10). Mr. Taylor noted that one reason teachers may not use technology more is "fear that they [the teacher] would be held responsible for any [student] misuse of the technology" (AINT.T.12-16-10). Administrators also indicated their concern with teachers having difficulty aligning technology with the subject matter they were teaching. Mrs. Anderson indicated that at this time technology trainings would not be beneficial for teachers because there was a greater need for improved instructional practices.

Concluding assessment of classroom technology use. Aside from interviews, a third party observation was conducted by Ms. Riley. The H.E.A.T. observation was conducted twice for this particular study. Data were collected September 2010 and compared to the data collected in December 2010. Table 2 presents the results of the H.E.A.T. observations.

Table 2

H.E.A.T. Results by Month

Item	September	December
Classrooms with teachers' lessons at the remember and understand levels	62%	81%
Classrooms with students engaged in the same teacher designed task	52%	62%
Classrooms with students completing tasks that were relevant only to the objectives	67%	71%
Classrooms with students using technology to acquire or create ideas and information	10%	0%

As Table 2 shows, no improvement in the meaningful use of technology was observed. Indeed, the meaningful use of instructional technology declined from September to December 2010. Data revealed that fewer students were using technology for learning and that fewer students were participating in assignments that promoted the use of higher level thinking skills. This data convinced me that Canyon Springs needed to be innovative in our teacher training to ensure that we were providing students with the instruction they need to succeed.

Chapter 5 Findings

To produce the findings of my research, I looked for patterns among my efforts at promoting meaningful use of instructional technology at Canyon Springs Middle School. Following the guidelines presented by Erickson (1986) and Smith (1997), I integrated data sources by color-coding various themes to inductively construct assertions that responded to my research question. I focused on what seemed to contribute most to the successes and failures of my efforts. I reread the professional literature reviewed in Chapter Two, and read all the data and results multiple times, searching for convergence as well as divergence. Marshall and Rossman (1999) claimed, "Reading, reading, and reading once more through the data forces the researcher to become familiar with those data in intimate ways" (p. 153).

To refine my assertions, I reviewed the data sources searching for evidence that supported or refuted each assertion. I wrote notes about my emerging interpretations, linking common results and characterizing them in general terms as recommended by Smith (1997). I stopped my search for findings when I could locate no more consistent patterns. As stated earlier, the research question was "What will happen when I promote the meaningful use of instructional technology at Canyon Springs Middle School?"

My interpretation of the data and results I generated during this action research led to four assertions. The assertions are as follows:

- The meaningful use of instructional technology remained minimal at Canyon Springs Middle School during fall 2010.

- My actions as a change agent informed Canyon Springs Middle School administrators about the role meaningful use of technology can play in instruction.
- Limited professional development, administrative vision, and expectations minimized Canyon Springs' teachers' meaningful use of instructional technology.
- Competing priorities and limited time minimized Canyon Springs Middle School administrators' efforts to improve the meaningful use of instructional technology.

Assertion One: Minimal Use of Instructional Technology

The meaningful use of instructional technology remained minimal at Canyon Springs Middle School during fall 2010. Despite my efforts to integrate instructional technology with teaching and learning at my school, primarily through an administrator coaching model, I discerned practically no change in participants' classrooms. The data sources leading to this assertion include H.E.A.T. observations, administrator interviews, and teacher interviews.

H.E.A.T. observations. The H.E.A.T. observations conducted September 2010 and December 2010 indicated minimal meaningful use of instructional technology in classrooms. Classroom observations revealed that the majority of students were not using technology. Indeed, the December 2010 observations indicated that fewer students were engaged in activities that utilized technology compared to the September 2010 observations. In addition, fewer students were engaged in higher level thinking activities.

Administrator interviews. During my September and December 2010 interviews with the Canyon Springs administrators, both stated that they observed Canyon Springs teachers making minimal use of technology. Both administrators reported that a majority of the teachers did not integrate technology into their lessons. The principal indicated that the teachers she observed used multimedia tools such as video clips, document cameras, virtual math manipulatives, and CPS remotes, but these were employed mainly for presentation purposes. Concurrent observations shared by Mr. Taylor supported Mrs. Anderson's claim, indicating that during his classroom observations, teachers used technology to present information, but students did not use technology to learn (AINT.A.12-17-10).

Teacher interviews. The December 2010 interviews with the focal group teachers indicated that Canyon Springs' teachers made minimal use of technology. Mr. Jones, one of the focal group teachers, indicated that he went above and beyond normal teaching by using technology in an effort to tap into the parts of students' brains that could not be accessed through traditional teaching methods. However, he claimed that not all teachers did the same. As Mr. Jones put it, "It makes me sick that great things [technology resources] are just sitting there unused" (FGINT.J.12-15-10).

Assertion Two: Acting as a Change Agent

My actions as a change agent informed Canyon Springs Middle School administrators about the role meaningful use of technology can play in instruction. A change agent has been defined as an individual who facilitates planned modifications or a planned innovation (Havelock, 1973). As a change

agent at Canyon Springs Middle School, I worked to help administrators become technology integration leaders.

Using Microsoft's Peer Coaching Cycle (Peer-Ed, n.d.), I collected baseline data from teachers and administrators at Canyon Springs Middle School. I spoke to administrators and teachers in great detail about meaningful technology use at Canyon Springs, and administrators conveyed a desire to tap into the power that technology had to engage students. In addition, Mrs. Anderson indicated that one of her goals was to promote technology as a purposeful tool. She realized that teachers could use technology as a way to check for understanding (AINT.A.7-30-10). When asked about goals for technology integration, Mr. Taylor said, "My goal, as an administrator, is to model effective uses of technology for staff" (AINT.T.7-29-10). Mr. Taylor stated that he would like to see teachers using technology to reach multiple learning styles (AINT.T.7-29-10).

After conducting the teacher interviews, administrator interviews, and H.E.A.T. observations, I disseminated the baseline data that I had collected to the Canyon Springs' administrators. Administrators and teachers alike both concluded that for the most part technology was used to present information to students. All parties wanted to see technology play a more purposeful role in students' learning processes.

As reported in Chapter Four, I asked the administrators to set specific goals regarding meaningful technology use at Canyon Springs Middle School. Although I had designed a plan for administrators to model features of the SMART Board, I wanted to create an authentic focus. After a few weeks, I met

with administrators again to discuss their goals. Administrators admitted they needed additional time because they were having difficulty locating the technology-related goals in the school district's Local Education Agency Improvement Plan. I assisted the administrators by procuring an up to date copy of the district's Local Education Agency Improvement Plan and identifying technology-related items. I provided a highlighted copy of the district's Local Education Agency Improvement Plan document to administrators to provide them with an opportunity to identify which items were closely aligned to the school goals.

While aligned technology goals were not set, I continued to dialog with the Canyon Springs' administrators about meaningful technology use on our campus. In addition, I continued to serve as coach by sharing articles and offering solutions to technology challenges. While I was unable to implement the innovation in the way I had planned, administrators were provided with ideas for increasing the meaningful use of technology at Canyon Springs Middle School. Mrs. Anderson indicated her next steps in relation to incorporating the meaningful use of technology would be as follows:

> [Focus on] the planning piece…articulate what we want to see in the classroom and put it in a vision statement, Then create an example and connect it. Working with a core group of teachers we could evaluate their lessons to add technology that will help them get kids to a higher level of thinking. (AINT.A.12-17-10)

Assertion Three: Limited Supports

Limited professional development opportunities, administrative vision, and expectations minimized Canyon Springs' teachers' meaningful use of instructional technology. The results of this study point to this constellation of limited supports that moderated teachers' use of instructional technology at Canyon Springs.

Professional development opportunities. My July, August, and December 2010 interviews with administrators as well as teachers revealed a lack of professional development related to the meaningful use of technology. While administrators and I discussed technology professional development opportunities that we could provide the Canyon Springs staff, resources such as time and money were not allocated to making the professional development opportunities a reality.

Although the focal group teachers acknowledged that they had been given access to technology tools, they indicated that professional development in how to incorporate the tools had not been provided. Mr. Jones said, "I don't think there has been a technology training all year" (FGINT.J.12-15-10). He went on to say that he was excited about the purchase of new student response systems with alphanumeric capabilities; however, he was not aware of the equipment's arrival or the district's two trainings on their use until a month or two later. To learn how to meaningfully use technology, teachers indicated they needed to do so on their own.

Teachers also noted that professional development in technology became a low priority when it was not embedded in their work day while being stacked

against the need to earn extra income or spend time with family. As reported in Chapter 4, Mr. Lewis indicated that training outside of his workday did not take precedence over his need to make money to support himself. Mr. Jones indicated that in order to learn how to use the new student response systems, he would have to teach himself over winter break. After winter break, I checked in with Mr. Jones and learned that he chose to not take personal time to determine how to use the new system. This resource had gone unused for five months at the time of this writing. Mr. Jones indicated this practice is a disservice to teachers and students alike.

Finally, the focal group teachers indicated across the board that professional development did not model best practices that teachers were expected to model with students. Teachers indicated that increased technology integration during professional development trainings by achievement advisors and school administrators would allow more priorities to be met. Mr. Jones stated, "They [achievement advisors] preach to us about modeling in the classroom, but you can't get them to answer a simple question [about technology] let alone something modeled properly" (FGINT.J.12-15-10).

Administrative vision. Canyon Springs' administrators reported receiving an unclear vision regarding the meaningful use of instructional technology from school district administrators, and the focal group teachers expressed similar opinions about the lack of vision and clarity they received from school administrators. The interviews revealed that the teachers saw this lack of

clarity as a detriment to change. As one teacher put it, “Administrators do not display much of a vision when it comes to technology” (FGINT.L.8-11-10).

Administrators made an initial attempt at displaying a "Vision of K-12 Learning" by Nesbitt (2007) at the beginning of the year, but teachers were not privy to additional ideas on meaningful technology use in the classroom. My administrator interview records and research log show that after several meetings with me in which the administrators completed and reviewed self-assessments and interviews relative to technology use, they were unable to establish school-wide goals concerning technology integration. This lack of goals impeded the coaching and professional development process associated with this research on meaningful technology use.

Expectations. District expectations, which were spelled out in the new teacher evaluation rubric, included a new category named *Materials and Technology*. The purpose of this new evaluation tool was to provide teachers and administrators with a common vision and clear performance expectations (Shough, 2010). Mrs. Garner, a focal group teacher, revealed that while a section of the teacher evaluation rubric assesses the meaningful use of technology, she was unclear on what exactly was expected and how she was being evaluated.

All three focal group teachers mentioned that measurable expectations were not effectively communicated in the rubric or by school administrators. Mr. Jones stated, “They [the school administrators] have no idea if what I’m doing is good. They don’t know how to use the technology, so how can they assess it?” (FGINT.J.12-15-10). One focal group teacher indicated that limited expectations

for the meaningful use of instructional technology were the result of administrators feeling that "technology does not get them the most bang for their buck" (FGINT.L.12-13-10).

While my conversations with the administrators made me privy to some of their thoughts on technology use at Canyon Springs, I did not witness this information being shared with the rest of the school staff. Teachers expressed frustration with the lack of communication in regards to technology. For instance, during an interview Mrs. Garner asked me what I thought the administrators would say if she set up a Twitter feed of math problems for her students. I told her I thought they would appreciate it because Mr. Taylor had indicated one of his goals was for teachers to have their own classroom websites. Mrs. Garner evidenced frustration when she replied with a sharp tone, "I didn't know that. Why don't they ever tell us these things?" (FGINT.G.12-17-10). Mrs. Garner's unawareness of Mr. Taylor's interest in teacher websites, indicates that there is a need for the administrators to communicate their expectations for the role that technology can play at Canyon Springs. Taking time to communicate expectations on the meaningful use of technology in the classroom may ease these frustrations and promote increased technology use.

Interestingly, Mr. Taylor, a Canyon Springs administrator, commented that a procedure that sets a clear expectation regarding student use of technology was needed. He indicated that one reason for teachers' minimal use of technology could result from their fear of repercussions due to students potentially misusing it. To get past this fear, he thought the district might need to institute a standard

operating procedure that held students responsible rather than teachers. District support regarding student misuse of technology may encourage teachers to use technology with students more frequently.

Assertion Four: Priorities and Time

While teachers' uses of technology were minimized due to limited supports, school administrators also encountered limitations that reduced their efforts to promote technology. Competing priorities and limited time impeded Canyon Springs Middle School administrators' efforts to lead improvements in the meaningful use of instructional technology.

Competing priorities. Competing priorities diminished the administrators' efforts to promote the meaningful use of technology. While administrators acknowledged the benefit of technology use, they did not consider it to be of the utmost priority at the time of this study.

One competing priority involved general instruction. Administrators indicated that classroom instruction needed to improve prior to a focus on integrating technology. For example, during the December 2010 administrator interview, Mrs. Anderson stated, "Teachers are unable to write objectives and task analyze. These good teaching practices are more important than technology integration" (AINT.A.12-17-10). Mr. Taylor stated that meaningful professional development meant meeting the needs of learners, and this might or might not involve technology.

Another priority involved the Canyon Springs teachers. Mr. Taylor referred to staff assessments that were conducted at the beginning of the 2010-

2011 school. Administrators had used this assessment to learn how to "set the stage for working together in PLCs" (ATEXT.A.3-8-11). Mr. Taylor indicated that this assessment led to him to believe that since few teachers self-selected into the group that displayed a computer on its card, he felt that was an indication that teachers did not value learning by way of technology. Mr. Taylor felt that he would not be meeting the learning needs of teachers if professional developments focused on technology. As a result, Mr. Taylor seemed to be downplaying technology because the teachers seemed to be downplaying it.

Another administrator, Mrs. Anderson enumerated the various priorities that already were being emphasized at the moment. As a result of these competing priorities, the Canyon Springs administrators noted that the integration of technology was not a main concern at the time. Mr. Taylor identified the following priorities:

- evaluation improvement
- strategic plans
- school improvement plans
- parental involvement
- relationship building among new teachers
- discipline and parental meetings
- the development of Individualized Educational Plan for students identified with learning disabilities (AINT.T.10-26-10).

Limited time. Constraints on time also hindered Canyon Springs Middle School administrators' leadership in the meaningful use of instructional

technology. In the December 2010 administrative interview, I asked Mr. Taylor about modeling the effective use of technology in professional development training. He replied, "I believe more of that has to happen, but I also need more time to plan my professional development [the professional development he was facilitating]. I can't get my assignment a day or two days before [and prepare an effective professional development that incorporates the meaningful use of technology]" (AINT.T.12-16-10). In addition, teacher interviews indicated that professional development that modeled the effective use of technology would assist them in learning more with the limited time currently reserved for teacher professional development. Mr. Lewis stated, "In the best world, they [training on technology and differentiated instruction] would be together. I wouldn't have to pick between one or the other" (FGINT.L.12-13-10). Limited time dedicated to professional development is a problem that has been identified by both teachers and administrators at Canyon Springs. Developing professional development programs that embed and model the use of meaningful technology while focusing on other instructional responsibilities (i.e., teaching strategies, content instruction) could be a way to make efficient use of limited time and increase the meaningful use of technology on the Canyon Springs campus.

Chapter 6 Conclusion

"Change is a journey, not a blueprint" (Fullan, 1993, p. 21).

I conducted the action research reported in this dissertation to help determine what I could do to increase the meaningful use of technology at my school. This chapter reports the discussion, implications for practice, implications for research, and a closing word relative to this study.

Discussion

As reported in Chapter Five, the participants in this study helped me identify several considerations associated with my attempts at changing the use of technology at Canyon Springs Middle School to one that promoted meaningful teaching and learning. Four considerations are noteworthy.

First, factors such as time, technological pedagogical content knowledge, and administrative vision and expectations deserved attention. Technology on the Canyon Springs campus was primarily used by teachers to present information to students. This was evidenced in the H.E.A.T. observations and the teacher, and administrator interviews. This evidence is clear that the presence of the technological tools by themselves did not equate to their meaningful use in classroom instruction. Just providing teachers opportunities to use technology meaningfully was insufficient. Teachers would benefit from embedded training, modeling, and support to increase the meaningful use of technology in the classroom.

My role as a change agent informed Canyon Springs' administrators about the role technology can play in meaningful instruction. Hasselbring et al. (2000) noted that administrators

> …are the gatekeepers who control classroom access to technology and who guide the culture of the school in ways that can either support the innovative use of learning technologies or stymie it. In virtually every successful school-wide implementation of technology, there can be found a knowledgeable and supportive building administrator who is adept at leading and managing systemic change. (p. 24)

This sentiment stresses the important role school leadership plays in teachers' meaningful use of technology in the classroom.

While unable to implement the innovation as planned, administrators and teachers were made aware of the need for increased focus on the meaningful use of technology. Additionally, the Canyon Springs faculty were provided opportunities to reexamine their beliefs on the meaningful use of technology and identify areas of strength as well as areas needing to be developed. Following guidelines by Hew and Brush (2007), it would be wise for administrators and teachers to cultivate these ideas further by formulating a plan for how to use the technology available, determining where to begin, setting goals to achieve, and instituting a guide along the way. Teachers and administrators realized that the school and district did well to provide access to tools for the meaningful use of technology. However, the need for professional development that models the meaningful use of technology, along with a clearly articulated administrative

vision and set of expectations were areas in need of attention. Developing these areas is a sensible way to support the development of teachers' beliefs and skills to use technology for students' and their own learning. In order to move ahead with this innovation, teachers and administrators will likely need additional support from the district in the form of human and financial capital (Browne & Ritchie, 1991; Interstate School Leaders Licensure Consortium, 1996; Kinnaman, 1990; Persky, 1990; Zhao, Pugh & Sheldon, 2002).

Second, in my quest to cultivate the meaningful use of technology at Canyon Springs Middle School, I discovered that change is a complex, non-linear process in which multiple interactions and events occur simultaneously as presented by Fullan and Miles (1992). I experienced interactions and events that impacted the planned innovation, and found it necessary to negotiate such relations as they occur. I found that changes to the meaningful technology use at Canyon Springs can be a slow and steady process which requires re-culturing of the individuals in the organization. I also found that negotiating change often requires additional time, modifications to existing plans, and additional resources that I had not previously anticipated as presented by Louis and Miles (1990). As a change agent, it was necessary to give and take in an effort to meet the needs of the administrators and teachers participating in my innovation as presented by Senge (1990). In order to increase the meaningful use of technology at Canyon Springs, a long-term commitment will be necessary as presented by Rogers (1995). In order to create sustainable change, change agents should recognize that

their role is not one of control; rather, it is one of facilitation as presented by Fullan (1999).

Third, providing participants opportunities to learn from others who share successful instructional strategies is a promising approach (Becker, 1994). In line with the social constructivism theoretical lens used for this study and reported in Chapter Two, collaboration among individuals who are willing to work together and share their experiences goes far in learning (Ernst, 1991; Kauchak & Eggen, 1998). Teachers benefit from sharing ideas, challenges, and successful practices of meaningful technology use. Providing teachers with opportunities to collaborate may assist teachers who are intimidated by technology to extend themselves based on the experiences of those before them ("Training Tech Shy Teachers," 2010). Collaboration creates an informal teaching process allowing teachers to learn from the success and failure of others (Wertsch, 1997). Furthermore, collaborative professional interactions have been shown to be essential in the creation or revision of mental models necessary for implementing technology in meaningful ways (Windschitl & Sahl, 2002).

Finally, while school administrators play the key role of leaders within Canyon Springs Middle School, they are unable to do it alone. Integrating the meaningful use of technology at Canyon Springs Middle School will require teacher leaders to contribute to the cause as presented by Hall and Hord (2006). It would be wise for school administrators to communicate a vision for the meaningful use of technology, but due to limited time and competing priorities, administrators will likely find it necessary to rely on teacher leaders to facilitate

and sustain change over time. Administrators may find that the peer coaching model supports the need for increased support and provides administrators with an opportunity to develop the teacher leaders they need to assist with the development of meaningful technology use in classrooms on the Canyon Springs campus as presented by Gale et al. (2002) and Hopkins-Thompson (2000). Teacher leaders can serve as peer coaches who work with teachers on a day-to-day basis to inform and shape instructional practices that enhances meaningful technology use through collaboration and modeling of TPACK (Koehler & Mishra, 2005; Neufeld & Roper, 2003; Norton & Gonzalez, 1998).

The four considerations just presented have informed me about the ways I can contribute to technology integration in a middle school, and they correspond in several ways with the scholarship reviewed in Chapter Two (i.e., social constructivist learning, peer coaching, and technological pedagogical content knowledge). Combining these considerations with the professional knowledge base reviewed earlier led me to three realizations about promoting meaningful uses of technology at my school.

First, I now realize that limited time and competing priorities impact the rate at which administrators and teachers achieve professional growth. As presented in the social constructivist theory, in order for educators to independently integrate the meaningful use of technology in their classroom instruction, administrators do well to provide teachers with scaffolds in line with Vygotsky's (1978) zone of proximal development (ZPD). Job-embedded, individualized, and on-going training seems important to meet the needs of

teachers (DuFour & Eaker, 1998). As teachers gain a certain degree of comfort, they can begin to integrate technology in meaningful ways on their own.

Providing teachers with more knowledgeable others (i.e., achievement advisors, peer coaches) may be a strategy administrators can utilize in their quest to increase the meaningful use of technology. Using professional learning communities and staff meetings to demonstrate the meaningful use of technology would be another strategy administrators could use to promote socially embedded learning opportunities congruent with the social constructivist theories that promote meaningful learning in context with peers.

A second realization is that the peer coaching model, discussed in Chapter Two, is especially promising because it promotes tailored learning opportunities that are goal oriented. A peer coach draws from the cultivation of personal relationships to coach individuals to reach their goals through follow up conversations devoted to reflection (Comer, 1995; Grant, 2001). Utilizing the peer coaching model to facilitate the Canyon Springs' administrators in their efforts to develop meaningful technology use on their campus may have benefited from an in depth investigation of the competing priorities faced at Canyon Springs prior to the implementation of my innovation. This would have then allowed me to modify my innovation to account for the competing priorities, as well as construct a response that embeds technology training within the instructional professional development deemed a priority by administrators. Blending these needs may facilitate the resolution of the competing priorities amid the need for meaningful technology use.

Finally, the lack of technological pedagogical content knowledge may continue to be a factor contributing to the minimal use of meaningful technology on the Canyon Springs campus. As summarized in Chapter Two, Technological Pedagogical Content Knowledge (TPACK) refers to educators' knowledge of the complex interplay of technology, pedagogy, and content, as well as the ability to negotiate between each while teaching. The relatively young staff at Canyon Springs Middle School may account for the lack of TPACK. In addition, veteran staff who are unfamiliar with the existence, components, and capabilities of current technologies used for teaching and learning are likely to find negotiating the relationships (i.e., knowing what to teach, how to teach it, and what technology to use to support the teaching and learning) amongst TPACK difficult (Angeli & Valanides, 2008**;** Murphy, 2007). Developing TPACK seems to be a substantial challenge associated with meaningful use of technology in the classroom. As teachers develop an understanding of the complex relationship between technology, pedagogy, and content, meaningful use of technology might increase. Developing TPACK on the Canyon Springs' campus may meet other administrative needs (i.e., developing a deeper understanding of content knowledge, pedagogical skills, and student engagement.

Implications for Practice

The incorporation of meaningful technology use in the classroom does not occur in isolation. Embedding meaningful technology use into the culture of Canyon Springs Middle School remains my goal. Administrators and teachers who begin to see technology as a tool that can be utilized to engage students and

promote learning in ways that were not previously available is a promising approach. As an educator at the Canyon Spring Middle School for 12 years, this research clarified for me the growing needs for innovation in teacher professional development. Administrators who provide teachers with learning opportunities that meet a variety of professional needs simultaneously can contribute to effectively integrating technology with instruction. Students do not have time to wait for teachers to get good at one aspect of teaching before beginning to improve in other areas that impact their success. Innovation in professional development requires educational institutions to rapidly identify and deploy strategies that leverage a variety of effective instructional practices to ensure engaging learning experiences for students.

This research clarified for me the need for administrators and teachers to hear one another's voices and opinions regarding the importance of innovation as well as professional development in the meaningful use of technology for the improvement of instruction. As this study demonstrated, many Canyon Springs' teachers perceived themselves integrating technology in their classrooms, although their administrative uses of it did not match administrators' desires for instructional uses. Efforts to clarify expectations for effective instructional technology use could yield aligned teacher and administrator perceptions, ultimately generating meaningful technology use in the classrooms.

The findings of this particular research can inform administrators at Canyon Springs Middle School about the relevance of a clear vision and set of expectations for the meaningful use of instructional technology as presented by

Ertmer et al. (2002) and Anderson and Dexter (2000). Developing and communicating a vision and matching expectations would probably go far in prioritizing technology integration (Holland, 2000; Murray, 2004).

While teachers at Canyon Springs Middle School stated that they wanted training on the technology tools available to them, setting aside time for training was problematic. It would be wise for Canyon Springs' administrators to embed technology training into current professional development efforts allowing teachers to see the benefits of meaningful technology use modeled for them within their instructional practices as presented by Reeves (2009b). It also would be wise for districts to alleviate some of the responsibilities placed on administrators by providing peer coaches who are able to incorporate the meaningful use of technology in professional development trainings or provide release time for technology mentors to train and support teachers in the classroom. Peer coaches could model meaningful technology during professional development sessions, and administrators and teachers could demonstrate the use of tools during staff meetings. Without on-going, content-embedded training during a teacher's professional work day, it is unlikely that meaningful use of technology will occur because teachers have competing priorities that make it difficult for them to participate in professional development outside of their current workday (Reeves, 2009a).

Reflecting on my efforts of this action research along with research on the change process, I would encourage change agents interested in increasing meaningful technology use to take the following action steps into consideration.

Be aware that change is a complex process often producing stress and anxiety. Taking time to develop four capacities associated with successful change agents (i.e., personal vision-building, inquiry, mastery, and collaboration) may contribute to successful organizational change (Fullan, 1993). I would recommend that one begin by identifying the most pressing school initiatives and investigating ways meaningful technology use can support successful implementation of those initiatives (Hall & Hord, 2001). A sensible next step may be to start small with a few key individuals piloting meaningful technology uses that show promise. It may be beneficial to start with learning experiences that can demonstrate quantifiable growth in areas related to the previously identified school initiatives. Using these pilots as an opportunity to develop the TPACK of a select group of teachers while meeting initiatives identified by administrators may foster the buy-in needed to begin work with a larger group of staff members. Buy-in can continue to be cultivated through on-going conversations focused on the benefits and challenges of the pilots possibly producing the instructional changes desired. Celebrations of success and brainstorming potential solutions to problems will likely build experience that can then be shared with other staff (Killion & Roy, 2009). Teachers who have experienced success in the pilots can serve as peer coaches along with administrators modeling for others (Reeves, 2009b). Staff and administrators committed to meaningful technology use can work together and overtime reach critical mass resulting in organizational change (Rogers, 1995). The aforementioned steps of preparation, experimentation, and reflection are an example of how change agents can incorporate Fullan's concept of "Ready, fire,

aim" (p. 24). Leaders who have taken the steps of preparing and experimenting are now prepared to "aim" declaring their vision and expectations for the meaningful use of technology in the classroom.

Implications for Research

The action research reported here suggests additional worthwhile inquiries relative to the meaningful use of instructional technology at Canyon Springs Middle School. First, future research could be conducted over a longer period of time. The results of this study revealed that lack of time was one of the significant barriers that administrators experienced in the development of clear visions and expectations, as well as lack of time in conducting various trainings in meaningful technology integration. Extending studies beyond one semester, as conducted in this action research study, would allow more time for the administrators and me to develop a clear vision and expectations as well as provide trainings for the teachers at their most convenient times. Additionally, it might point to ways that time could be used more efficiently (i.e., embedding technology training within other professional development areas such as differentiated learning).

Another possible next step for this action research would be for me to investigate the impact instructional coaching that incorporates technology has on teacher practice. Incorporating the peer coaching model by providing teachers with a more knowledgeable other who can assist them in reflective dialogue regarding current instructional practices and technologies that can support higher level thinking may provide teachers with the support needed to increase the

meaningful use of technology (Norton & Gonzalez, 1998; Vygotsky, 1978). Teachers who have a peer coach or support system to provide them with training, implementation ideas, as well as in-classroom support will likely see an increase in the meaningful use of technology. The peer coaching process would likely benefit teachers if it were used to guide teachers in making connections between their current skills and practices with practices they want to incorporate into future classroom instruction (Neufeld & Roper, 2003). In line with the train-the-trainer model and an effort to produce more wide-reaching results, it may be wise to implement the peer coaching procedure with achievement advisors thus enabling more teachers to incorporate the meaningful use of technology in the classroom.

Closing Word

Because today's youth are surrounded with technology, the meaningful use of technology in classrooms seems essential for increasing student engagement, motivation, and learning. As educators, we will succeed by adapting to the changing world and making use of modern innovations in teaching that cultivate creativity, problem solving, and communication; skills that are needed to succeed in the 21st Century. Administrative vision and expectations along with time within the current workday dedicated to continuous professional development are promising factors involved in educators developing the skill and knowledge in the use of technology as a meaningful instructional tool. Incorporating the use of peer coaches who can promote collaboration and strengthen technological pedagogical and content knowledge will likely yield

additional benefits to the development of meaningful technology use in the classroom. Combining these factors clearly is complex and time consuming, but doing so seems essential for helping students gain the skills they need to survive in a society that requires technology.

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APPENDIX A

STAFF MEETING PRESENTATIONS

Staff Meeting Presentations	Date
SMART Board: Random Word Chooser	August 31, 2010
SMART Board: Dice	September 7, 2010
SMART Board: Sentence Arrange	September 14, 2010
SMART Board: Random Text/Image Tool	September 21, 2010
SMART Board: Venn Diagram	September 28, 2010
SMART Board: Compass	October 5, 2010
SMART Board: Protractor	October 19, 2010
SMART Board: Vortex Sort	October 26, 2010
SMART Board: Reveal Tools	November 2, 2010
SMART Board: Timeline Reveal	November 9, 2010

APPENDIX B

ADMINISTRATIVE INTERVIEW QUESTIONS

1. Describe a lesson that effectively integrates technology.

2. How would you rate the majority of your teachers in regards to technology integration?

   Highly effective *Somewhat effective* *Somewhat ineffective* *Ineffective*

3. How do you integrate technology in your professional duties?

4. How would you rate your technology integration?

   Highly effective *Somewhat effective* *Somewhat ineffective* *Ineffective*

5. Describe how you communicate the importance of technology integration to your staff.

6. Describe the professional development opportunities you provide for your staff in regards to technology integration.

7. What are your goals for technology integration?

8. Do you look specifically for how technology is written in teacher lesson plans?

APPENDIX C

COACHING CONFERENCE QUESTIONS

Coaching Guide
Goals for the week:

What did you get done?

How did it go?

Did anything deter you from accomplishing your goal?

Homework:

APPENDIX D

PRINCIPAL'S COMPUTER TECHNOLOGY SURVEY

Consent

July 15, 2010

Dear Participant:

I am a graduate student under the direction of Professor David Moore in the College of Education at Arizona State University. I am conducting a research study to determine the impact of coaching on administrators in relation to technology integration in the classroom.

I am inviting your participation, which will involve coaching sessions, goal setting, evaluation, technology training, interviews, and surveys which will begin July 2010 and end in December 2010. You have the right not to answer any question, and to stop the interview at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty.

While there may be no direct benefits, your participation in this study may improve your comfort level with technology, enhance your administrative leadership in relation to technology, and/or increase technology integration in the classrooms at your school.

Results of these findings will be used to inform academia about the impact of coaching administrators to be technology leaders has on classroom technology integration. There are no foreseeable risks or discomforts to your participation.

Any and all identifying information will be removed from these materials and replaced with anonymously coded numbers to ensure confidentiality. The results of this study may be used in reports, presentations, or publications but your name will not be used.

If you have any questions concerning the research study, please contact the research team at: Kristen.N.Robertson@ASU.edu or 623.237.4642. You may also contact Dr. David Moore at Arizona State University West at 602.543.6300. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study.

Return of the questionnaire will be considered your consent to participate.

Thank you for your time and participation!

Sincerely,

Ms. Kristen Robertson

Technology Teacher

Grades 4-8

Principal's Computer Technology Survey

by Brockmeier and Gibson

Brockmeier, L. & Gibson, N. (2009). Validation of the principal's computer technology survey. *The Georgia Educational Researcher*, 7(1). Retrieved from http://coefaculty.valdosta.edu/lschmert/gera/volume-7/TechSurv-BrockGib-formatted.pdf.

Brockmeier, W.C . & Hope, L.L. (2002). Principals' self-report of their computer technology expertise. In F. K. Kochan & C. J. Reed (Eds.), *Southern Regional Conference on Educational Administration 2002 Yearbook; Accountability: Education and Educational Leaders under a Microscope* (p. 57-64). University of Auburn, AL: Truman Pierce Institute.

Purpose: This research examines the principal's (a) role (facilitation or participation) in integrating technology into the teaching and learning process, (b) perceptions of computer technology for managerial or administrative tasks and in teaching and learning, (c) expertise in using computer technology, and (d) professional development needs to enhance computer technology skills.

Directions: Please select the answer that best represents your degree of agreement with each statement.

Curriculum Integration

1.) I allocate a significant amount of time to assist teachers in integrating computer technology into their instruction.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

2.) Facilitating computer technology integration into the teaching and learning process is one of my important instructional tasks.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

3.) I am familiar with many academic software programs that teachers can use to support teaching and learning.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

4.) I support computer technology integration in teachers' instruction by providing computer technology training experiences.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

5.) I encourage teacher collaboration in using computer technology for teaching and learning.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

6.) I provide teachers release time to facilitate their becoming familiar with the capabilities of technology devices.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

7.) I provide teachers release time to evaluate software to determine its appropriateness for integration into the teaching and learning process.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

8.) I encourage teachers' use of computer technology to meet learners' individual needs.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

9.) I ensure equity of access to computer technology resources.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

10.) I use the International Society of Educational Technology (ISTE) standards to assist me in facilitating computer technology integration into classroom instruction.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

11.) I refer to the National Educational Technology Plan to inform instructional practices at my school.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

Perceptions

Directions: Please select the answer that best represents your degree of agreement with each statement.

12.) The integration of computer technology into the teaching and learning process is a decision best made by the teacher.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

13.) Computer technology generally provides a more efficient way to complete tasks than using paper and pencil.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

14.) Principals' professional development to use computer technology has been a focus of the district's efforts to infuse computer technology into schools.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

15.) Computer technology can be used to improve student academic achievement.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

16.) My computer technology expertise contributes to me being viewed as a technology leader in the school.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

17.) I am capable of evaluating computer technology that can be used to support instruction.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

18.) The International Society for Technology Education (ISTE) standards for administrators can assist me to facilitate computer technology integration into instruction.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

19.) My ability to use computer technology improves my managerial or administrative performance.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

Acquired Expertise

Directions: Please select the answer that best represents your degree of agreement with each statement.

20.) I routinely use a word-processing program to compose correspondence (memos and letters).
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

21.) I routinely use a electronic mail (e-mail to communicate with faculty, staff, and colleagues).
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

22.) I use computer technology on a regular basis to develop schedules.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

23.) I use computer technology on a regular basis to create databases.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

24.) I use computer technology on a regular basis to construct budgets.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

25.) I use computer technology on a regular basis to make presentations.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

26.) I access and navigate within the district's information management system to retrieve information.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

27.) I access Arizona's eLearning Platform (IDEAL) for information to support teaching and learning.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

Needs Assessment

Directions: Please select the answer that best represents your degree of agreement with each statement.

28.) I would benefit from professional development experiences that assist me to assess computer technologies influence on student achievement.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

29.) I would benefit from professional development experiences that inform me on how to integrate computer technology into the curriculum.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

30.) I would benefit from professional development experiences that promote my understanding of legal issues related to software licensing.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

31.) I would benefit from professional development experiences that promote my understanding of ethical issues related to computer technology.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

32.) I would like to participate in more professional development experiences that teach me how to apply computer technology to my work as an administrator.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

33.) I would like to participate in professional development experiences to learn about protecting students from inappropriate materials available on the Internet.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

34.) I would like to participate in computer technology professional development experiences that assist me to facilitate organizational change.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

35.) I would like to participate in professional development experiences that assist me to use computer technology to collect and analyze data.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

Professional Development

Directions: Please select the answer that best represents your degree of agreement with each statement.

36.) The school district has offered training for administrators on the use of computer technology to develop budgets.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

37.) The school district has offered training for administrators on the use of computer technology to create databases.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

38.) The school district has provided professional development experiences for administrators in using the Internet for research purposes.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

39.) The school district has provided professional development for administrators in using productivity applications such as spreadsheets, presentations, e-mail, and word processing.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

40.) I have participated in professional development activities related to becoming a more influential technology leader.
( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

41.) I have experienced professional development that assists me in evaluating software applications to be used in the teaching and learning process.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

42.) I have experienced professional development that assists me in evaluating technology hardware to be used in the teaching and learning process.

( ) Strongly agree

( ) Agree

( ) Neither Agree nor Disagree

( ) Disagree

( ) Strongly disagree

Demographic Information

) Gender
[ ] Male

[ ] Female

) Race or Ethnicity
[ ] African American

[ ] American Indian/Alaskan Native

[ ] Asian/Pacific Islander

[ ] Caucasian

[ ] Hispanic

[ ] Other

) Educational Level
[ ] Master's Degree

[ ] Education Specialist's Degree

[ ] Doctorate

) School Configuration
[ ] Elementary

[ ] Middle

[ ] High

[ ] Other

) Computer Technology Expertise
[ ] Novice

[ ] Intermediate

[ ] Advanced

[ ] Expert

) Years of Experience as an Administrator
_____

Thank You!

Thank you for taking my survey. Your responses are very important to me.

APPENDIX E

DATA COLLECTION TIMELINE

Data Source	When Gathered
Technology Integration Specialist Observations	August 2010, November 2010 Pre Weeks 2-4 Post Weeks 15-16
Teacher Observations	August 2010, November 2010 Pre Weeks 2-4 Post Weeks 15-16
Administrative Interviews (PCTS and Coaching Conferences)	PCTS: July 2010 and December 2010 Coaching Conferences: Bi-Monthly Mondays Weeks 1-16
Teacher Interviews	August 2010, November 2010 Pre Weeks 2-4 Post Weeks 15-16
Researcher Log	Weekly Weeks 1-16
Member Checks	Week 15-16

APPENDIX F

FIELD NOTES DOCUMENTATON FORM

Research Question:

(1) What will happen when I promote the meaningful use of instructional technology at Canyon Springs Middle School?

Dependent Variable: Meaningful technology use

Independent Variable: Coaching administrators

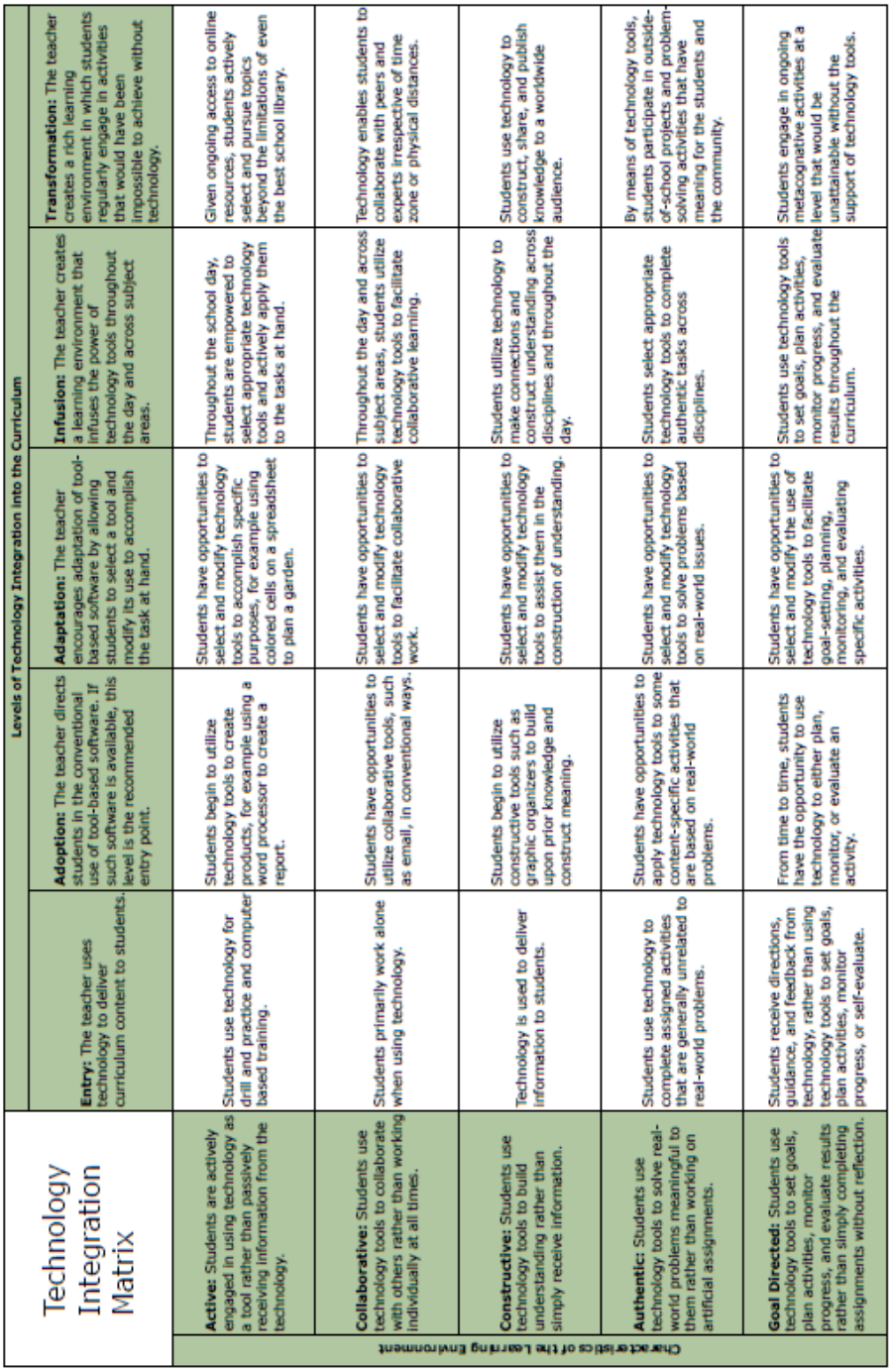
Indicators: Increased technology use in the classroom, student engagement

<table>
<tr><td colspan="3">Observation</td><td rowspan="2">Interpretation</td></tr>
<tr><td>How many times did the teacher touch technology?</td><td>How many times did the students touch technology?</td><td>How many different students touched technology? How long?</td></tr>
<tr><td colspan="3"></td><td rowspan="3"></td></tr>
<tr><td>What was the teacher’s technological comfort level?</td><td>How was the technology integrated into the content?</td><td>What was the lesson? Type of technology? Content?</td></tr>
<tr><td colspan="3"></td></tr>
</table>

APPENDIX G

TECHNOLOGY INTEGRATION MATRIX

Florida Center for Instructional Technology. (2007). *Technology Integration Matrix*. University of Southern Florida. Retrieved from http://fcit.usf.edu/matrix/download/indicators.pdf



Technology Integration Matrix	Levels of Technology Integration into the Curriculum				
Characteristics of the Learning Environment	**Entry:** The teacher uses technology to deliver curriculum content to students.	**Adoption:** The teacher directs students in the conventional use of tool-based software. If such software is available, this level is the recommended entry point.	**Adaptation:** The teacher encourages adaptation of tool-based software by allowing students to select a tool and modify its use to accomplish the task at hand.	**Infusion:** The teacher creates a learning environment that infuses the power of technology tools throughout the day and across subject areas.	**Transformation:** The teacher creates a rich learning environment in which students regularly engage in activities that would have been impossible to achieve without technology.
Active: Students are actively engaged in using technology as a tool rather than passively receiving information from the technology.	Students use technology for drill and practice and computer based training.	Students begin to utilize technology tools to create products, for example using a word processor to create a report.	Students have opportunities to select and modify technology tools to accomplish specific purposes, for example using colored cells on a spreadsheet to plan a garden.	Throughout the school day, students are empowered to select appropriate technology tools and actively apply them to the tasks at hand.	Given ongoing access to online resources, students actively select and pursue topics beyond the limitations of even the best school library.
Collaborative: Students use technology tools to collaborate with others rather than working individually at all times.	Students primarily work alone when using technology.	Students have opportunities to utilize collaborative tools, such as email, in conventional ways.	Students have opportunities to select and modify technology tools to facilitate collaborative work.	Throughout the day and across subject areas, students utilize technology tools to facilitate collaborative learning.	Technology enables students to collaborate with peers and experts irrespective of time zone or physical distances.
Constructive: Students use technology tools to build understanding rather than simply receive information.	Technology is used to deliver information to students.	Students begin to utilize constructive tools such as graphic organizers to build upon prior knowledge and construct meaning.	Students have opportunities to select and modify technology tools to assist them in the construction of understanding.	Students utilize technology to make connections and construct understanding across disciplines and throughout the day.	Students use technology to construct, share, and publish knowledge to a worldwide audience.
Authentic: Students use technology tools to solve real-world problems meaningful to them rather than working on artificial assignments.	Students use technology to complete assigned activities that are generally unrelated to real-world problems.	Students have opportunities to apply technology tools to some content-specific activities that are based on real-world problems.	Students have opportunities to select and modify technology tools to solve problems based on real-world issues.	Students select appropriate technology tools to complete authentic tasks across disciplines.	By means of technology tools, students participate in outside-of-school projects and problem-solving activities that have meaning for the students and the community.
Goal Directed: Students use technology tools to set goals, plan activities, monitor progress, and evaluate results rather than simply completing assignments without reflection.	Students receive directions, guidance, and feedback from technology, rather than using technology tools to set goals, plan activities, monitor progress, or self-evaluate.	From time to time, students have the opportunity to use technology to either plan, monitor, or evaluate an activity.	Students have opportunities to select and modify the use of technology tools to facilitate goal-setting, planning, monitoring, and evaluating specific activities.	Students use technology tools to set goals, plan activities, monitor progress, and evaluate results throughout the curriculum.	Students engage in ongoing metacognative activities at a level that would be unattainable without the support of technology tools.

APPENDIX H

TEACHER INTERVIEW QUESTIONS

Please answer the following questions regarding your administrators' communication of a vision for technology integration.

1. What strengths do the administrators display when communicating their vision for technology?

2. What suggestions do you have for improvement in the administrator's communication of a vision for technology?

3. How would you rate the administrators' communication of a vision for technology?

   Highly effective *Effective* *Ineffective* *Highly ineffective*

4. How would you describe the administrators' ability to provide technology resources?

5. How would you rate the administrators' ability to provide technology resources?

   New resources are easy to obtain *New resources are somewhat easy to obtain*

6. How would you describe the administrators' strengths in regards to providing sustainable professional development opportunities promoting technology integration?

7. How would you rate the administrators' ability to provide sustainable professional development opportunities promoting technology integration?

   Frequently provided Sometimes provided Rarely provided Never provided

8. How would you describe how administrators evaluate your ability to integrate technology?

9. How would you rate how often your administrators evaluate your ability to integrate technology in the classroom?

   Frequently Sometimes Rarely Never

10. How would you describe the administrators' ability to model technology integration?

11. How would you rate your administrators' ability to model technology integration?

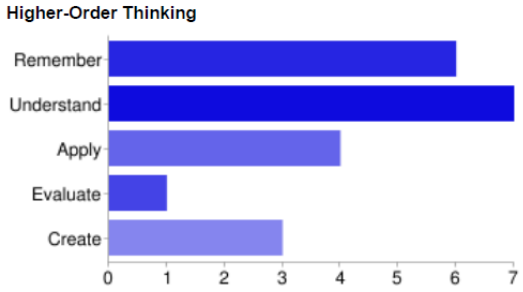
    Highly effective Effective Ineffective Highly ineffective

APPENDIX I

SEPTEMBER H.E.A.T. OBSERVATION RESULTS

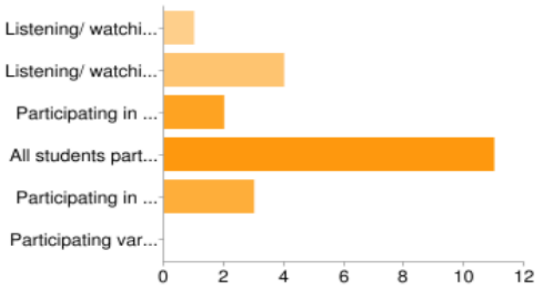
21 responses

Summary See complete responses



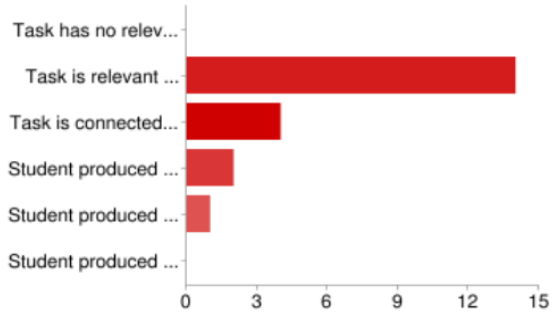
Remember	6	29%
Understand	7	33%
Apply	4	19%
Evaluate	1	5%
Create	3	14%

Engaged Learning



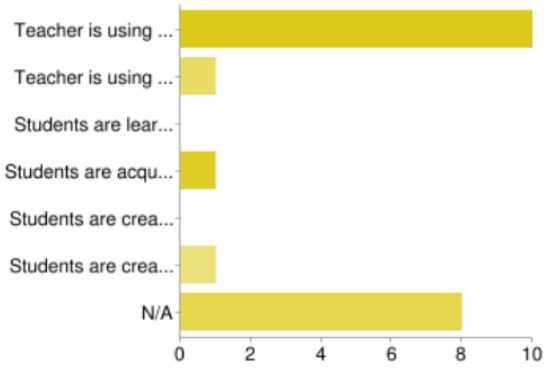
Listening/ watching presentation- no notes
Listening/ watching presentation- with notes
Participating in a discussion
All students participating in the same task(s)- tea
Participating in various self-directed tasks- teache
Participating various self-directed tasks- student

Authentic Learning



Task has no relevance
Task is relevant to objective only (worksheet)
Task is connected to real-life applications (story p
Student produced product that has value inside th
Student produced product that has hypothetical v
Student produced product that has actual value o

Technology Use Level



Teacher is using technology to present
Teacher is using technology to model/ simulate- s
Students are learning how to use the tool
Students are acquiring information, practice skills
Students are creating something that can be crea
Students are creating a product that cannot be cr
N/A

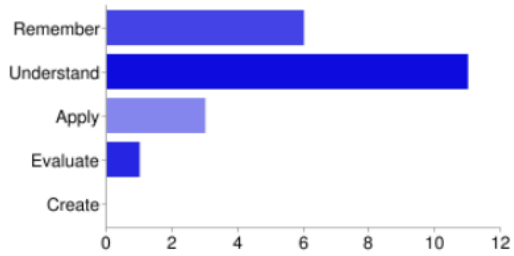
APPENDIX J

DECEMBER H.E.A.T. OBSERVATION RESULTS

21 responses

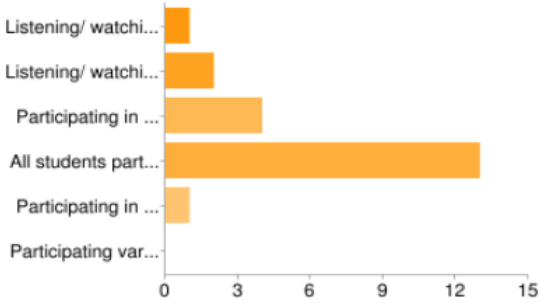
Summary See complete responses

Higher-Order Thinking



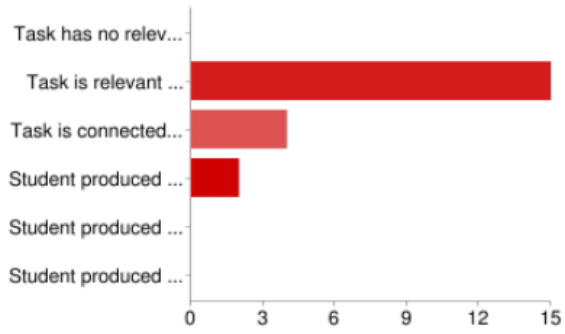
Remember	6	29%
Understand	11	52%
Apply	3	14%
Evaluate	1	5%
Create	0	0%

Engaged Learning

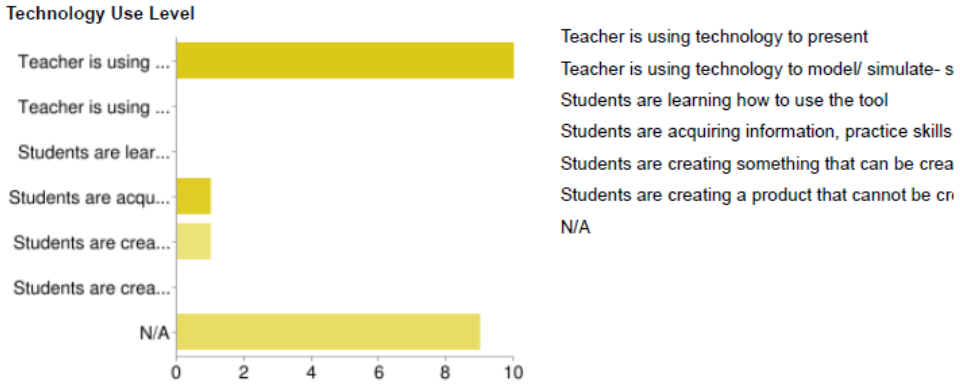


Listening/ watching presentation- no notes
Listening/ watching presentation- with notes
Participating in a discussion
All students participating in the same task(s)- teac
Participating in various self-directed tasks- teache
Participating various self-directed tasks- student c

Authentic Learning



Task has no relevance
Task is relevant to objective only (worksheet)
Task is connected to real-life applications (story p
Student produced product that has value inside th
Student produced product that has hypothetical v
Student produced product that has actual value o


Technology Use Level
Teacher is using ...
Teacher is using ...
Students are lear...
Students are acqu...
Students are crea...
Students are crea...
N/A
0
2
4
6
8
10
Teacher is using technology to present
Teacher is using technology to model/ simulate- s
Students are learning how to use the tool
Students are acquiring information, practice skills
Students are creating something that can be crea
Students are creating a product that cannot be cr
N/A

APPENDIX K

INSTITUTIONAL REVIEW BOARD APPROVAL

ASU Knowledge Enterprise Development

Office of Research Integrity and Assurance

To:	David Moore FAB
From:	Mark Roosa, Chair Soc Beh IRB
Date:	06/18/2010
Committee Action:	**Exemption Granted**
IRB Action Date:	06/18/2010
IRB Protocol #:	1006005247
Study Title:	Generation WhY Learn: Coaching Administrators to be Technology Integration Leaders

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(1) (2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.