

HOW PRINCIPAL PARTICIPATION IN AN ONLINE COMMUNITY OF PRACTICE
IMPACTS THE PROFESSIONAL DEVELOPMENT EXPERIENCE OF MIDDLE
SCHOOL TEACHERS

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DEDICATION

This dissertation is dedicated to my husband, Gareth, and my son, Christian. Gareth, you promised me years ago to make my dreams come true. It has been a very difficult ride, but through your sacrifices, love, and, most of all, patience, you have seen me to my dream. You will never know how much that means to me. And to Christian. You may not remember this when you get older, but thank you for letting mommy work when you wanted to play, and for laughing. The site of your face giggling is one of the only things that helped on a bad day. And to both of you, I promise, this is my last degree...at least for now.

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ABSTRACT

This study provided insights about incorporating an online community of practice into a professional development program designed to facilitate the instructional implementation of technology. Two middle schools in a southern state served as a comparative case study where this model of professional development was implemented. The primary goal of this research was to gain understanding of how principals interact with teachers and the roles principals assume during these interactions. A second goal was to determine how teachers perceived principal participation and how their levels of competence and efficacy were influenced by this experience. During four weeks of implementation principals participated with their teachers as members of the online community. Qualitative data were collected from the online threaded discussions, focus group interviews with teachers, individual principal interviews, and periodic teacher self-reports. Quantitative data from a Likert-scale survey and unit plans scored with a numeric rubric were collected. Results showed that principal contributions to the online community fell into two categories: emotional support and professional support. In addition, principals noted that the any time, any place aspect of the online community of practice was beneficial and allowed them to increase communication with their teachers. Through their participation principals gained insight about their teachers' beliefs about technology integration, their reactions to professional development, their varying levels of competence with technology, and their motivation to use technology. Challenges identified by principals included their limited technology proficiency, difficulties facilitating full participation by faculty, and time constraints. This experience also allowed teachers to gain insights about their principals' priorities and their values and

beliefs about learning. Findings revealed differences in the support and pressure strategies utilized by these principals which reflected varying leadership styles. These differences impacted teachers' perceptions of the experience and the quality of the culminating activity. Techniques used to provide support, such as showing humor, encouraging competition, encouraging peer relationships and making suggestions had a positive impact on perceptions, whereas pressure had a positive impact on task performance. Implications of principal leadership style as exemplified through their participation in an online community of practice are discussed.

CHAPTER ONE

INTRODUCTION

Among the many challenges facing teachers in America today are problems that arise from inadequate professional development. Professional development for teachers is criticized as being ineffective because it is often a detached activity that focuses on a single training session not connected to a teacher's pedagogy or to student achievement. Teachers are not receiving ongoing professional development to increase content knowledge and improve technical skills (National Commission on Teaching and America's Future [NCTAF], 2003). Furthermore, teachers participating in professional development sessions often receive no follow-up sessions. Among the many problems that arise from such ineffective professional development, three critical issues are prominent: the neglect of the special needs of middle school teachers, concerns surrounding the self-efficacy of teachers, and the lack of principal support while teachers are engaged in the activities.

The first critical issue surrounding ineffective professional development is the special needs of middle grades teachers. Most often trained at the elementary or secondary level, teachers in middle schools are often not given specialized professional development needed to teach children in the middle grades. One study reported eighty percent of middle grades teachers being questioned did not hold certification to teach those grades (Petzko, 2002). Consequently, it has been suggested that these teachers are less satisfied with their careers than their colleagues in elementary or high schools (Scales & McEwin, 1994). Many teachers at this level, lacking specialized training, also lack training specific to the middle level philosophy and lack background knowledge to

participate in leadership and collaborative activities at their schools (Petzko, 2002). In addition, many principals of middle schools are concerned about teachers at this level feeling like “second class citizens” to their elementary and secondary counterparts (Petzko, 2002).

Because of these unique challenges, the National Staff Development Council has called for more teacher support and practical professional development; however, because of lack of specialized pre-service preparation, this professional development must take place while school is in session (Flowers, Mertens & Mulhall, 2002; Killion, 1999). It is recommended that these efforts focus on the special needs of middle grades teachers that were not addressed during preparatory work and should provide teachers with hands-on professional development activities, opportunities for collaboration with peers, and, most of all, continuous support from administration in creating a school culture that values the sharing of teachers’ experiences in professional development (Park, Ertmer & Cramer, 2004).

The second critical issue often not addressed in designing and developing effective professional development is the impact of sessions on a teacher’s sense of self-efficacy. Self-efficacy is defined as a person’s beliefs about his or her capabilities to perform at a given level of achievement, or a person’s influence over other people (Bandura, 1994). Self-efficacy can affect a person’s life choices, motivation in an activity, success in an activity, and resilience to adversity (Bandura, 1994; Tschannen-Moran, Hoy & Hoy, 1998). A teacher’s sense of self-efficacy can also affect his or her involvement in a professional development experience, as well as his or her later classroom implementation of the material taught in a professional development

experience. To impact teachers' self-efficacy, mastery experiences in which teachers can participate and foster a professional learning community should be created (Tschannen-Moran et al., 1998). In such a community, a teacher can be exposed to others' successes with a given topic, as well as gain the support needed to change self-efficacy beliefs.

Two additional ways to impact a teacher's self-efficacy are to facilitate collective efficacy and to provide supportive leadership (Tschannen-Moran et al., 1998). Collective efficacy is the extent to which efficacy is shared across teachers in a school building and can be established through collaborative, supportive experience among teachers within a school: "Schools where teachers work together to find ways to address the learning motivation and behavior problems of their students are likely to enhance teachers' feelings of efficacy" (Tschannen-Moran et al., 1998, p. 217). Significant leadership can also influence a teacher's sense of efficacy. Research has shown that when a principal displays strong leadership, teachers' collective sense of efficacy is greater (Fuller & Izu, 1986). It has also been stated that in order for a school to make changes and be successful, principals must focus on the development of teachers' knowledge and skills and professional communities (Fullan, 2002). When a principal supports a teacher's learning, that teacher succeeds (Blase & Blase, 2000). Research has also suggested that principals can support teacher learning by building interpersonal relationships among teachers (Barth, 1990) and emphasizing teacher learning (Elmore, 2004). One method of supporting teachers' learning is to create a supportive learning community (Drago-Severson, 2005). A collective sense of self-efficacy within a school, in addition to successful leadership, has a strong impact on the culture of that school and the efficacy of the individual members.

The final critical issue infrequently addressed in professional development is the need for strong leadership and support during professional development sessions. Professional development for teachers often lacks proper support from school administrators even though principals are key to its success (Darling-Hammond, 2003a; Fullan, 2002). The problem arises when principals lack sufficient time and resources to communicate with their teachers about professional development experiences. Moreover, administrators and teachers often disagree with what type of professional development is needed (Flowers & Mertens, 2003). Without support from a caring leader, teachers participating in professional development sessions may not see the value of the program and may not attain the interpersonal relationships needed to make the program a success. In short, principals who strive to foster a healthy school climate by promoting collaboration during professional development sessions and by fostering teachers' professional learning often facilitate more successful professional development experiences. However, finding a medium for principals to foster such a school climate often poses a problem for the busy schedules of principals.

In addition to the unique needs of middle school teachers, the influence of self-efficacy, and the need for leadership and support during professional development, teachers are now facing new mandates from the No Child Left Behind Act, including gaining the status of being highly qualified, mastering changes in curriculum, and addressing technology integration into this new curriculum. Middle school teachers, in particular, are struggling to gain the title of being highly qualified. Because most teachers of middle grade students are certified to teach either elementary or high school students, these teachers must now complete extra work to attain certification to continue

teaching at the middle school level. To become highly qualified, teachers are required, in addition to their teaching certificate earned, to do one of the following: pass the state subject-specific licensing examination for middle school academic content area, achieve National Board certification in the content area, complete coursework equivalent to an academic major in a content area, earn a Master's degree in a content area for every core subject taught, or attain ninety Continuing Learning Units (CLU's) by the end of the 2005-2006 school year.

Along with concerns surrounding their highly qualified status, teachers in some states are facing changes in curriculum. In one southern state, teachers are in the first year of adopting a new curriculum. This mandated new curriculum for all teachers grades K-12 is based on grade-level expectations (GLE's), or statements of what all students should know or be able to accomplish by the end of each grade. The curriculum is divided into units of study within each major subject and identifies guiding questions, GLE's, sample activities, and assessment options for each unit. Many teachers are having difficulty adjusting to the new curriculum and find it lacking the flexibility needed to make teaching successful.

No Child Left Behind also addresses technology integration in K-12 schools in addition to mandates created by curriculum changes and certification. According to the guidelines of No Child Left Behind, a minimum of twenty-five percent of all funds spent on educational technology must be allocated for high quality professional development. In addition, the International Society for Technology in Education (ISTE) has developed standards for technology integration that have now been adopted, adapted or referenced by 90% of state departments in the United States (2005). NETS, or the National

Educational Technology Standards, identify the fundamental concepts concerning technology that should be mastered by teachers, students, and administrators (2005).

Technology integration, and therefore effective professional development for technology integration, has now become an additional mandate. Many schools in the past have employed technology sessions focused on a particular program as opposed to ongoing professional development focused on technology integration.

Technology integration for middle school teachers remains low. Some studies explain this deficit by stating that middle school teachers lack technology support and control over instructional time and preparation time (Jin & Abate, 1999). “For the average teacher the use of technology has not been an empowering experience. Consequently, the level of technology use has remained relatively low” (Jin & Abate, 1999, p.2). Other researchers found that insufficient training, lack of control of initiatives, and teacher attitude toward technology also explain low technology use (Yerrick & Hoving, 1999). Many also believe that in middle schools, focus has remained on quantity of hardware available to teachers rather than quality of use of that hardware (Clark, 2000; Jin & Abate, 1999).

Existing Solutions for Teacher Professional Development

Techniques for making professional development more successful focus on just-in-time professional development, teachers training teachers, and online sessions (Liew & Hang, 2000; Parr, 1999). Just-in-time professional development involves teachers participating in professional development within their classrooms and within their schools. However, when the focus of professional development is technology, a technology specialist is required to be available to teachers when they need it. Such a

requirement is somewhat unrealistic in many schools today. Teachers training teachers is a collaborative professional development opportunity with teacher leaders assuming the roles of trainers of their peers. Again, this professional development requires expert teachers to be present within a school to serve as teacher leaders. In addition, it requires teachers to have time to collaborate within a school day. Many believe that this type of collaboration, used in conjunction with interdisciplinary teaming, is the key to the professional development of middle-grades teachers (Flowers, Mertens & Mulhall, 2003). Teaming allows teachers with common daily planning times to collaborate and grow professionally.

Lastly, online professional development offers many benefits, including convenience, immediate application, professional growth, and economic advantages (Tinker, 2003). While the advantages of online professional development are numerous, many teachers remain uncomfortable with technology. Teachers often have limited expertise in using computers; therefore, delivering this professional development via a computer may not be the best course of action. In addition, many teachers who are more comfortable with technology still become frustrated with the process of online interactions, which can lead to a negative experience with this type of delivery system (Schlager, Fusco & Schank, 1999). Moreover, if schools offer online professional development, that also requires the school to provide some technical knowledge and assistance, which schools often do not have. Although online professional development poses problems, it also has many benefits, most prominent of which involves allowing online teacher collaboration. Online communities of practice allow teachers to collaborate across groups and across time.

A New Approach to Technology Professional Development

Drawing from the many strategies concerning effective professional development for middle grade teachers, this study employed a new model for professional development, focused on topics concerning technology integration for middle school teachers, drawn from two ideas: teachers work more effectively when collaborating among peers, and professional development is most successful when given with proper support from the principal of a school.

The literature related to communities of practice suggests that adult learners work more effectively when placed in a social, collaborative environment (Wenger & Snyder, 2000). Furthermore, successful communities rely on participants learning about something meaningful (Brown, 1997). By using these theories within professional development, teachers can become less isolated and more inclined to discuss new ideas, can solve problems that arise concerning technology integration, and can form a support system to foster new ideas.

Teachers are in many ways the most isolated of professionals- teaching is still by and large a solo pursuit. Renewed teaching relies on generating new ideas and on having opportunities to examine one's own teaching. A supportive community of practice can help to sustain the slow, stepwise process that eventually leads to a fundamental transformation in teaching philosophy and practice (Spitzer, Wedding & DiMauro, 1994, p. 1).

Although there is research that demonstrates how communities of practice can foster collaboration among professionals, there is little research exploring the role of administrative support in communities of practice.

Key to the idea of communities of practice used in conjunction with professional development is teacher support from his or her principal. The importance of a principal in leading instructional reform has been well documented (Akhavan, 2002; Fullan, 2004;

Pelika, 2000). However, given the busy schedule and daily challenges of a K-12 principal, leading technology integration reform often proves difficult (Chan & Pool, 2002; Furman & Zibrida, 1990). This study will use an online community of practice to compensate for these difficulties and allow principals to support teachers virtually during professional development.

An innovative approach to providing professional development to middle school teachers was designed, implemented and evaluated. The approach incorporated components identified as effective from established research findings. Those included benefits from job-embedded professional development, topics concerning the special needs of middle grades teachers, strategies to impact the self-efficacy of teachers, and benefits associated with effective support from principals during teacher professional development. Face-to-face professional development sessions, designed to provide job-embedded professional development to meet the needs of middle school teachers concerning technology integration were delivered. These sessions were supported by an online community of practice, designed to allow a medium for principal participation and collaboration during the professional development experience.

Problem Statement

The purpose of this study was to provide insights about an innovative approach to professional development designed to facilitate the instructional implementation of technology. Two middle schools in a southern state served a comparative case study where the model of professional development was implemented. The following research questions guided the study:

1. In what ways do principals participate in the online component of the professional development?
 - What contributions to the online interaction do principals make (e.g., promoting teacher reflection, promoting professional growth)?
 - What do principals learn about their teachers as a result of their participation?
 - What were the additional challenges and benefits for the principals participating in the program?
2. In what ways does this professional development experience influence middle school teachers?
 - How does participation in this experience influence teachers' competency with instructional technology?
 - How is the participation of the principal perceived by teachers?
 - What are the benefits and challenges for teachers in this experience?

Significance of the Study

Middle school teachers have a unique need for specialized professional development because of the lack of specialized preparation in this area. It has been stated that ongoing professional development for new teachers, as well as veteran teachers, that address curriculum practice and collaboration skills should be mandated for middle school teachers, "To do any less would be to compromise the future success of young adolescents" (Petzko, 2002, p.20). Although there is a growing body of literature on middle school teaming and student achievement, research is lacking concerning what works and what does not work for the professional development of middle grades

teachers. “Our knowledge about effective staff development strategies to promote effective middle schools is just beginning to emerge. We know enough to set out on the journey, but not enough to develop simple plans for how to do it right” (Louis, 2000, p. 95). This study aimed to contribute to the existing literature on the use of communities of practice in facilitating the knowledge and skills of teachers implementing technology as part of their instructional practice.

Research is also needed in the use of communities of practice for developing supportive educational environments. “In future research there is a need for examining the advantages and shortcomings of using community of practice as a tool for designing and developing educational environments” (Yamagata-Lynch, 2001, p.8). This research strove to provide insight into communities of practice used as a tool for fostering the professional development, as well as a medium for principal support. Although research exists on defining characteristics of effective leaders in schools (Blase & Blase, 2000), this research seeks to contribute to the literature by investigating the effect of different forms of principal involvement in a professional development program on middle school teachers. In addition to supporting the use of the online communities, this research strove to provide insight into ways to promote teacher self-efficacy. “Little is known about how vicarious experiences and verbal persuasions affect the creation and development of academic self-efficacy beliefs” (Pajares, 1997, p. 20). This research sought to explore the self-efficacy beliefs of teachers before and after the experience, and to determine the principal’s role in the development of teachers’ sense of self-efficacy as a result of participation in the professional development experience.

Limitations of the Study

This study employed a mixed method multiple case study design (Yin, 2003). Although primarily qualitative, some quantitative data were collected to give further insight into the culture of each school and the self-efficacy of teachers participating in the experience. A challenge of this type of research is the difficulty in translating one form of data into the other form so that results of both qualitative and quantitative data can be compared (Creswell, 2002). Furthermore, once compared, the two sources of data may contain conflicting results (Creswell, 2002).

Gall, Borg and Gall (1996) identify two limitations of case study research: the difficulty of identity concealment of the situation being studied, and the transferability of case study findings. Ethical problems can arise if the identity of the organization being studied proves difficult to disguise (Gall et al., 1996). In addition, although the purpose of case study research is to provide insight into a situation, it is still possible, although difficult, to allow the results of case study research to be generalized to other situations (Gall et al., 1996).

The main disadvantage of case study research is this difficulty of generalizing the findings to other situations (Gall et al., 1996). Transferability can be increased in two ways. Cases used in this type of research should not be chosen if atypical. Furthermore, thick description of the participants and contexts should be provided so that readers can determine if their situation is similar to that in the study (Gall et al., 1996). Reader transferability is a term that states that it is the responsibility of the reader of case study research to determine the applicability of the findings of the study to his or her own situation (Lincoln & Guba, 1984). In this study, thick descriptions of the two middle

schools participating in the professional development, as well as a school climate survey, will be used to provide information to fully describe the context and participants being studied. This will allow readers to determine the transferability of the findings to their own settings.

Definition of Terms

- Asynchronous communication- communication not done in real time, as in e-mail or threaded discussions
- Collaboration- group members sharing unique ideas and experiences. In this study, grade level teachers collaborated through teaming times, teachers meeting each instructional day for forty-five minutes to discuss student needs, curriculum needs, and professional development.
- Community of practice- term established by Etienne Wenger in 1998, it means a group of professionals that come together in a formal or informal setting to improve their quality of work
- Comprehensive curriculum- an innovative curriculum guide being implemented in all K-12 schools. Based on grade-level expectations (GLE's), or statements of what all students should know or be able to accomplish by the end of each grade, the curriculum is divided into units of study within each major subject, and identifies guiding questions, GLE's, sample activities, and assessment options for each unit.
- Instructional technology- teachers using new innovations to support student learning. In this study, teachers used productivity tools, research tools, and communication tools in technology to enhance learning.

- Middle grade teachers- teachers instructing students in grades six through eight
- Online community- Blackboard- an online delivery system where teachers and principals had access to group e-mail, technology resources, and also participated in weekly threaded (asynchronous) discussions.
- Professional development- teachers participating in experiences to attain knowledge and skills
- Self-efficacy- a person's belief about his or her capabilities to perform at a given level of attainment, as measured by "Teachers Using Technology," a research instrument.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

America's school setting is changing at such a rapid pace that it is difficult for both teachers and administrators to stay abreast of the latest trends (Seng, 1998). In order for faculty to keep up, teachers must have effective professional development.

Technology integration is one area where teachers are in need of effective professional development to keep up with the rapidly changing trends. Teacher professional development is a widely researched field with few congruent solutions. Teacher technology professional development is evolving to include several new approaches to teacher professional development. Researchers agree that teacher collaboration is key to successful technology professional development (Johnson, 1981; Liaw & Huang, 2000; Parr, 1999); however, the question remains of how to develop these collaborative professional development experiences with the common concern of teacher release time, extra pay, and job-embedded staff development. One answer that is being studied is hybrid, or partially online, professional development. Hanson-Harding (2000) states, "with more and more states mandating continuing education for teachers, and teachers facing requirements to teach to new, more rigorous standards, there has been in the past few years a marked increase in the demand for teacher training." However, he also suggests that this demand makes a case for a new type of professional development: "When this demand meets increased access to computers and the Internet in schools and in homes, it seems suddenly clear that distance learning for teachers is the wave of the future" (Hanson-Harding, 2000 p. 64).

Collaborative learning experiences can be produced through online communities of practice. By developing collaboration online, teachers can have the benefit of online discussions while maintaining face-to-face professional development. Utilizing an online component for teacher professional development may very well be in the future for teachers, but simply using the media is not enough. Clark (1985) advocates that the use of a particular media as a delivery of instruction is not the decisive factor in studies. The technology is certainly a good tool, but how can it be incorporated into professional development with the ultimate goal being higher student achievement? The key is collaboration and communication. “We found the most authentic learning experiences take advantage of Web-based communication tools, such as e-mail, discussion boards, or chat, to reach remote but diverse learners” (Branzburg & Kennedy, 2001 p. 18). If using new technology could promote collaboration and communication between teachers that are in a professional development situation, a new type of professional development could possibly lead to many more positive outcomes in the classroom other than simply using a new media type.

Models for Professional Development

The National Commission on Teaching and America’s Future states that the main challenge facing schools is not recruiting new teachers, but retaining the current teachers in America. Furthermore, an important aspect to retaining effective teachers is effective professional development (NCTAF, 2003). Many models for effective professional development for teachers exist, varying in level of complexity and ease of integration.

Sparks and Loucks-Horsley (1989) discuss five models for staff development. The models include: individual guidance, observation and assessment, involvement in a

development and improvement process, training, and inquiry. Each model is distinct; furthermore, each model can be used by an individual school system depending on the needs of the particular staff. Individually guided staff development is a professional development model in which the teacher determines his or her own goals or interests to be studied. The teacher then determines the activities he or she needs to attain these goals. This model is designed for self-directed faculty members. The second model, observation and assessment, is built on the premise that teachers, when collaborating with other professionals, can receive constructive feedback that can help to improve existing practices. The observation and assessment model pairs teachers to evaluate and give feedback through thoughtful reflection. The third model of staff development is involvement in a development and improvement process. This model is most often used when a school or faculty have a specific problem to solve.

The training model is a more traditional model for staff development that allows teachers to develop skills or knowledge. Using the traditional training model for teachers to develop instructional skills is well established (Sparks & Loucks-Horsley, 1989). However, the impact of the training “depends upon its objectives and the quality of the training program” (Sparks & Loucks-Horsley, 1989). Finally, the inquiry model relies heavily on a teacher’s interest, as well as the foundation of those interests. In conjunction with five models presented for staff development, Sparks and Loucks-Horsley (1989) state that no matter which model for professional development is used, three characteristics must be present: faculty must have a clear set of goals and objectives, administrators must exercise effective leadership, and faculty and administrators must place high priority on staff development.

Based on the traditional training model, Wood, Killian, McQuarrie & Thompson (1993) developed a model to implement effective staff development to sustain lasting change. This model involves five stages: the readiness stage, the planning stage, the training stage, the implementation stage, and the maintenance stage. The RPTIM model is based on the belief that long-range planning is key to improving school conditions (Wood et al., 1993). The RPTIM model begins with the readiness stage. In this stage, faculty and administrators must establish a supportive climate because the climate of a school affects teachers' and administrators' readiness to improve current practice (Wood et al., 1993). To establish this climate, a planning team must be created. Much like Sparks and Loucks-Horsley's model of involvement in a development and improvement process, Wood et al., (1993) state that a planning team, involving not only administrators, but all stakeholders in the training, should discuss budget, time, faculty buy-in, programs to be taught, and community support for the upcoming training. The planning stage in the RPTIM model involves a faculty needs assessment and construction of objectives for staff development.

The traditional training stage involves four key tasks: designing an effective in-service program, selecting effective trainers to deliver the in-service program, scheduling the program, and ensuring participation of the staff (Wood et al., 1993). After the in-service training has taken place, the implementation stage begins. As Rogers (2004) discusses, a critical mass of teachers must adopt any change for it to be successful. This stage is built on the assumption that teachers often do not transfer what they learn in training sessions into daily practices. The implementation stage focuses on giving assistance to teachers when needed, providing recognition for successful implementation,

and providing resources needed for implementation. Finally, the maintenance stage focuses on ensuring that the changes that take place within a school are maintained for a period of time.

Kelleher (2003) has developed a simple model for professional development that focuses not only on training of teachers, but also on student achievement. In his six-stage professional development cycle, Kelleher states that stage one of any professional development activity should be an analysis of student achievement and defining goals from that analysis to be achieved through professional development. Here, teachers choose the professional development opportunities they wish to participate in based on the needs of their students. Stage two suggests that teachers prepare for the professional development experience by defining rules and protocols to be used to evaluate the impact of professional development on student achievement. Stage three is the professional development activity itself. Here, Kelleher defines four professional development activities to be considered: peer collaboration, individualized professional growth, research and leadership, and external experiences. Although all activities can be useful, Kelleher emphasizes the impact of peer collaboration activities and job embedded professional development. Stage four consists of teacher reflection and sharing among colleagues. Finally, stages five and six focus on implementing a change, and evaluating how this change impacts student achievement.

Models for Technology Professional Development

Taylor and Walls (2005) have developed a condensed model for staff development. This nine-step program has the prerequisite of teachers attending a course that addresses teacher technology standards (Standards, 2001) and teaches basic

computer training for professional teachers. From each school that wishes to participate, three teachers and one administrator must sign a commitment form. After being accepted, participants attend a five-day workshop that allows teachers to develop integrated, cross-disciplinary technology units (Taylor & Walls, 2005). During the training, teachers have opportunities to work collaboratively and discuss the connection of their unit to curriculum standards. Units created are then evaluated by peers and experts before being posted to a free website, accessible to all.

In step five of the program, the administrator from the participating school attends a one day workshop that introduces the principal to the website where the models were posted. Teachers then return to their classrooms and implement the created lesson. The website where the units were posted allows teachers to share their technology integration ideas with other teachers not only in their school, but also across the world. Step eight involves the evaluation of technology use in the classroom. By using the National Educational Technology Standards (2001), administrators and other teachers evaluate the unit and its effectiveness to enhance student learning by using technology. Lastly, step nine unifies all phases by joining trainers with teachers and allowing access to all unit plans that have been developed and evaluated.

Instead of focusing on training, Lan, et al., (2000) have developed a model for technology infusion to be used in Chinese middle schools. This model differs in three distinct ways: it focuses on a timeline for implementation, it requires all school personnel (including administrators and support staff) to attend and master training of technology and it requires the mastery of technology beyond the basic level of integration. In this model, technology is integrated through two training sessions, each containing thirty

hours of traditional training. School employees are expected to learn and master skills such as the use of multimedia software and school networks. After the initial thirty-hour training, more advanced faculty are chosen to attend the second training. After training sessions are completed, all faculties are trained at integrating technology, and technology leaders are trained as mentors, thus creating a cross-discipline faculty group with advanced technology skills (Lan et al., 2000). In this model, technology is not presented as a skill one must learn. In contrast, it is presented as “a necessary tool to achieve the instructional goals established by the mission of the school” (Lan et al., 2000, p. 6). The authors recognize that these ideas would be a change for Western schools; however, they also state that since many other American professions approach technology this way (such as engineers and doctors), why can teachers not be held to the same standard?

Online Professional Development

In contrast to traditional professional development models, online professional development can offer teachers flexible training that can be easy to schedule, less expensive, and more effective than traditional professional development (Tinker, 2003). In addition, adding an online component to teacher professional development can present opportunities not found in traditional professional development experiences. Although most online learning experiences offer material presentation and additional access to resources, a well-designed online learning experience can offer virtual learning communities, demonstrations of what is being taught, and ongoing support.

A hybrid professional development opportunity is one that incorporates both online professional development and face-to-face training. “A hybrid format of learning combines both the efficiency and accessibility of online learning with the value of the

practice and peer interaction teachers need to successfully use the skills taught” (Barkley & Bianco, 2002, p. 42). One type of hybrid professional development model includes an orientation face-to-face meeting and several meetings intertwined within the training period to allow real-time feedback and to promote virtual collaboration. This face-to-face contact allows many teachers to become more familiar and comfortable with the process of online learning (Salpeter, 2003).

Many successful hybrid professional development courses also incorporate classroom observations (Peterman, 2003). In addition, the Regional Educational Technology Assistance Program, or RETA project, discusses how the constructivist-based program increased teachers’ use of technology in the classroom, increased the collaboration among teachers, and allowed teachers to assume more leadership roles within their schools (Gonzales, Pickett, Hupert & Martin, 2002) Researchers observed the process of RETA, the workshops, and performed classroom observations after the workshops were given. The findings were that teachers were more inclined, after taking the workshop courses, to become teacher leaders and mentor other teachers in the areas of technology. Through a program such as this, a district could use the mentors to ease technological anxiety and ease teachers into implementing new ideas.

Two well-developed online professional development opportunities are the Public Broadcasting System (2005), and George Lucas’ Edutopia (2005). Both sites offer K-12 teacher technology professional development in a convenient way. The Public Broadcasting (2005) site offers pedagogical resources and allows learners to earn a certificate of proficiency in technology integration. This site also provides a community center that allows for synchronous and asynchronous communication for members to

gather and discuss ideas that would be typically impossible without this use of technology. Edutopia (2005) offers similar services and, in addition, includes professionally produced video clips of teacher best practices for learners to view on their own computer and at their own convenience.

Many school systems are experimenting with just-in-time technology professional development. Salpeter (2003) discusses how schools in Richmond County, Indiana, can participate in WebCast. WebCast is a just-in-time professional development opportunity that was created out of concerns of teacher release time and scheduling problems associated with traditional professional development training opportunities. WebCast transforms live training sessions into online multimedia workshops for just-in-time learning (Salpeter, 2003). Streaming video is used to show a trainer giving a professional development session and is often combined on the screen with a PowerPoint presentation or simulation to enhance learning.

Levin, Waddoups, Levin, and Buell (2001) emphasize that an online environment also must be scrutinized and evaluated just as a face-to-face professional development opportunity should. They discuss five dimensions that contribute to effective online learning and therefore should be used as guidelines for the development for successful online professional development. Online learning should contain relevant assignments, coordinated learning environments, timely feedback from instructors, environments that promote interaction and collaboration, and flexible learning experiences. Although these guidelines are similar to face-to-face professional development models, they are particularly vital in the successful implementation of an online component of a professional development opportunity (Levin, et al., 2001).

Online learning communities are the biggest asset to online professional development. As noted by Killion (2000), “Well-designed online staff development encourages and facilitates increased interaction among students and between students and the instructor” (p. 51). Therefore, some type of established learning community could be a significant asset to online professional development.

A commonly researched topic of the online world is the notion of a virtual community (Dias, 1999; Schlager, Fusco & Schank, 1999; Trentin, 2001). Researchers and educators who have taught and learned in this environment stress the importance and presence of this community formed between online learners. Trentin (2001) elaborates further that an ongoing community should be established early, often, and even after the fact in online learning.

Collaboration in Teacher Professional Development

Educational psychology research has, for some years, studied questions of collaboration among peers. Johnson (1981) defines four benefits of peer collaboration: increased achievement, socialization of attitudes, promotion of psychological health, and the reduction of social isolation. Early cognitive studies such as this form the building blocks of collaborative studies by examining teacher collaboration within a professional development setting.

Many researchers believe in the power of collaboration in teacher technology professional development (Johnson, 1981; Liaw & Huang, 2000; Parr, 1999). Parr (1999) examines one school’s effort in implementing technology into the classrooms of teachers. Teacher professional development was offered in conjunction with in-house support for a period of five years. Researchers concluded that although teacher use of

computers, as well as teacher confidence, was increased through the program, classroom computer use remained low. As a conclusion, Parr indicated a primary reason for the lack of classroom technology use was lack of collaboration.

Hawkes (2001) suggests a specific medium in which this collaboration should take place in his discussion of network-based communication. He states that although collaboration is not the ultimate goal of teacher professional development, media can be used to aid teachers in attaining educational objectives. Collaboration is not the objective, of course, but in order to attain higher levels of technology into the classroom, and therefore higher student achievement, network based communications technology may be the answer. “The evidence showed that collaboratively produced network based communication was significantly more reflective than face-to-face discourse between teachers” (Hawkes, 2001). If this is true, a network based communication plan could be used to promote collaboration between and among teachers in a technology professional development setting, therefore fostering the integration of technology into their classrooms. Hawkes (1999) also discusses the benefits of network-based communication in the area of teacher professional development. He speaks of how asynchronous communication devices fit well into a teacher’s busy schedule as well as allow a teacher to reflect upon critical topics (Hawkes, 1999).

Liaw and Huang (2000) conducted a review of literature surrounding the topic of interactivity in web-based instruction. In this review, the authors discuss different types of interactivity in online learning, and benefits and downfalls of each. The authors discuss how learning will occur in a more productive manner with interactivity and how interactivity must become the norm for all online learning environments. “Based on

these points, interactivity design in web-based instruction (WBI) is essential to implement the effective delivery of instructional content (Liaw & Huang, 2000, p. 44). In addition, Yang (1996) discusses how communication and interactivity differ in online classes versus face-to-face settings. Yang defines six areas in which collaboration can improve online learning: it can celebrate multiple perspectives, harbor relational thinking, empower learner initiatives, develop flexible thinking, support collaborative learning, and promote interdisciplinary learning (Yang, 1996). Yang concludes that by promoting a constructivist, collaborative environment in online learning, learning will be more productive.

Middle Schools: A Unique Situation

Teaching students in middle grades is a difficult job to accomplish because middle school is a crucial turning point in the education of a student (Killion, 1999). In the National Staff Development Council's report entitled "What works in the middle: Results-based staff-development," Killion indicates that classroom teachers at this level now have a greater percentage of at-risk students, a greater percentage of students with inadequate support or care from a traditional family, and a greater percentage of students with emotional or learning disabilities (1999). In addition, Killion reports that many teachers of middle grade students were trained to teach either elementary or high school students. This, in turn, has led to the report that junior high teachers are less satisfied with their careers than their colleagues in elementary or high schools (Scales & McEwin, 1994). Due to these challenges, the National Staff Development Council has called for the strengthening of educational curriculum for middle grade students, and more teacher support and practical training (Killion, 1999).

Research has stated that, in order to allow students to become more successful, teachers must be more competent (National Commission on Teaching and America's Future, 1996). In other words, the better the teacher, the more successful the student will be (Killion, 1999). According to the National Middle School Association, "The best way to increase teacher effectiveness in the classroom is through regular, high quality professional development (2004)." In order to successfully teach middle grade students, teachers must participate in staff development that not only increases their knowledge and skills, but also provides support to develop comfort with skills learned (Killion, 1999). Although time and funding continue to be a problem concerning effective professional development for middle grades teachers, many researchers agree that "...there is an absolute need for meaningful, on-going professional development if teachers and schools are to work effectively to meet the changing needs of (middle school) students (Dickinson, Butler & Pittard, 2003, p. 131).

Pate & Thompson (2003) define professional development with two concepts, the professional, and the development, or continual deepening of knowledge and skills of that professional. What makes this professional development effective for middle grades teachers is action. "Teachers must take something from professional development and make changes in their teaching. Without change, professional development benefits only the adult engaged in the opportunity and not necessarily the middle school student (Pate & Thompson, 2003, p. 140). Pate & Thompson, making recommendations for effective professional development for middle grade teachers, discuss that professional development cannot be mandated (2003). In order to be effective, teachers must have to want to improve their teaching. Teachers who participate in the training, then, become

teachers who make change happen within a middle school (Pate & Thompson, 2003).

Also key to the experience is for teacher to be provided time to discuss, share and engage in reflection following any professional development experience (Pate & Thompson, 2003). Professional development that deepens middle school teachers' knowledge and skills sometimes occurs individually, but most often occur within a community of learners (Pate & Thompson, 2003). In conclusion, Pate & Thompson state:

...we must keep in mind what we know about middle school teachers. Teachers are very much like their middle school students. Middle school teachers and middle school students are knowledgeable, spontaneous, inquisitive, fun-loving, and have serious thoughts questions, and concerns...Just as teachers keep in mind what they know about their students as they develop curriculum, instruction, and assessment, so must we keep in mind both the characteristics of middle school teachers as adult learners and what makes professional development experiences effective (Pate & Thompson, 2003, p. 155).

Flowers, Mertens & Mulhall, 2002, define important lessons learned about teachers in middle schools and professional development. First, they reiterate the fact that most middle grade teachers do not have middle grades certification, underscoring the importance of effective professional development. Middle grade teachers must receive much of the specialized training to effectively teach their students while teaching in middle level schools. Secondly, Flowers, Mertens & Mulhall discuss that teacher professional development should be based on administrator and teacher input. Using existing data, the authors analyzed discrepancies between teachers' and administrator's viewpoints about training teachers need most. Although administrators chose items such as peer coaching, teacher-led advisory and data-based decision making as the highest needed training topics needed by their faculty, teachers ranked using computers as part of instruction, and working with 'at risk' students as their highest need for training (Flowers, Mertens & Mulhall, 2002). This data highlights the need for teachers and

administrators to work together in choosing professional development opportunities because opinions differ greatly between teachers and administrators as to what trainings are needed. Flowers, Mertens & Mulhall (2003) also discuss how challenges faced in middle school professional development could be helped by teacher teaming, or teachers meeting at least four times each week for thirty minutes or more to discuss classroom practices.

Flowers & Mertens (2003) conducted a study examining professional development experiences for teachers in three southern states. Citing four implications, Flowers & Mertens first confirmed the earlier statement that teachers' and administrators' perspectives differ on what professional development is needed within their middle school (2003). In addition, researchers concluded that even though middle school teachers' rates of participation in professional development activities are relatively low, teachers do voice the need for additional professional development activities. Lastly, researchers discovered that the 'one size fits all' approach to professional development within a district is ineffective. Sub-groups of teachers, including those with fewer than five years of teaching experience, need different amounts and types of professional development. Flowers & Mertens (2003) suggest a mentoring program for all middle school teachers with fewer than five years experience as a possible solution to this problem.

In a study concerning the relationships among classroom teaching, learning activities, and technology integration in the middle school classroom, Abate & Bagaka (2002) reach many conclusions about teachers using technology with their middle grade students. In analyzing teachers in three middle school classrooms, researchers found that

teachers participating in the study were more likely to allow their students to participate in traditional activities than technology-based activities. When allowing students to participate in technology-based activities, however, teachers were much more likely to allow students to use word processing software, Internet research tools, and e-mail as opposed to productivity tools. The study also found that although classroom teachers identify goals of using technology as a productivity tool, factors impeding the use of technology as a productivity tool included lack of teacher training, lack of ease, students' lack of skills, and lack of accessibility to technology (Abate & Bagaka, 2002)

Similarly, Clark (2000) conducted a study of twenty-eight middle school teachers examining teacher perspectives of their use of instructional technology. Clark found that teachers in this middle school had positive attitudes toward technology. However, these attitudes could be tarnished if teachers are not given opportunities to use and integrate technology into their classrooms. Clark also found that teachers in this school feel that technology is a key part of the process of educating their students, and that teachers feel the need for more technology in their classrooms. Results of the study discuss how teachers are ready and willing to take technology integration beyond word processing. Teachers expressed a need for technology professional development that would allow students to use technology for a multitude of purposes (Clark, 2000).

As stated, many studies agree on the need for professional development reform at the middle school level. Teachers at this level face many challenges, such as lack of professional development in their field and the need for continuous support and dialogue with administrators to choose needed professional development experiences (Flowers, Mertens & Mulhall, 2002). Park, Ertmer & Cramer discussed results from their

examination of three middle school teachers participating in technology professional development (2004). Data from this study indicated that effective professional development for middle school teachers should provide teachers hands-on professional development activities provide opportunities for collaboration with peers, and, most of all, provide continuous support from administration in creating a school culture that values the sharing of teachers' experiences in the professional development.

Teacher Self-Efficacy

Although the term teacher efficacy has various definitions, the research behind the theory is based on two frameworks (Tschannen-Moran et al., 1998). Initial research grew out of Rotter's theory of control. Rotter (1966) examined the relationship between a person's beliefs, their actions, and the outcome of their actions. Early research investigated the extent to which teachers believed that they could control their actions, or if their actions were controlled by the external environment (Tschannen-Moran et al., 1998). Research determined that teachers with a high level of efficacy believed that they could either control or strongly influence student achievement and motivation (Tschannen-Moran et al., 1998).

Evolving from these beliefs, Bandura (1994, 1997) developed the social cognitive theory. The social cognitive theory (Bandura, 1994, 1997) proposed that a person's behavior, cognitive and other personal factors, as well as one's environment interact to influence each other. Here, Bandura identified teacher efficacy as a type of self-efficacy. Perceived self-efficacy was defined as a person's beliefs about his or her capabilities to perform at a given level of attainment, or a person's influence over other people (Bandura, 1994). Self-efficacy was believed to affect a person's life choices, motivation

in an activity, success in an activity, and resilience to adversity (Bandura, 1994, Tschannen-Moran et al., 1998). The beliefs that people have about themselves are key elements in the production of a person's environment (Bandura, Barbaranelli & Caprara, 1996). Self-efficacy is one of the few theories that described a distinction between a person's competence and contingency (Skinner, 1996). In short, the theory of self-efficacy described the difference between a teacher believing she possessed the skills to execute an action and those actions producing the desired outcome. Self-efficacy involves self-perception of competence rather than actual level of competence (Tschannen-Moran et al., 1998). Bandura (1994) suggested that in order for teachers to adapt to their ever-changing field, they must have a "robust sense of efficacy to sustain the perseverant effort needed to succeed" (Bandura, 1994).

Self-efficacy beliefs are critical in determining how well knowledge and skill are acquired (Pajares, 1997). In a professional development setting, perceived self-efficacy can play a vital role on a teacher's expectations and successes. How people interpret their own performance alters their self-beliefs, which therefore alters their performance (Pajares, 1997). Teachers with high self-efficacy expect to gain knowledge through good performance. They see opportunities and approach the new opportunities with self-assurance, tackling obstacles in the way. In contrast, teachers with low self-efficacy who expect to perform poorly, dwell on the obstacles, convincing themselves that they will not succeed (Bandura, 2000). Self-efficacy beliefs influence the choices a person makes and the courses of action they pursue (Pajares, 1997). For example, a teacher's self-efficacy belief can lead to full participation in a professional development setting or stagnation in relation to professional practice

Pajares (1996, 1997) deciphers three specific areas of self-efficacy research in the educational arena. The first involves research on the effect of self-efficacy beliefs and career choices of students. The second involves correlational research between a student's academic performance and achievement. The third discusses efficacy beliefs of teachers in relation to their instructional practices and to various student outcomes.

Early research on teacher self-efficacy involved the study of teachers' sense of efficacy and student performance (Tschannen-Moran et al., 1998). In 1976, the Rand Corporation conducted a study where various reading programs and interventions were conducted; teacher efficacy was measured and related to reading achievement scores by students (Armor et al., 1976). The Rand studies suggested that teachers' sense of efficacy had a strong positive effect on student performance. These studies further suggest that a teachers' sense of efficacy has an effect on project goals achieved, and the continued use of new methods and materials used by teachers (Tschannen-Moran et al., 1998, Rotter, 1966). In addition, the Rand studies suggested that improved teacher self-efficacy could relate to reduced stress among teachers, as well as improved relations among teachers and administrators (Tschannen-Moran et al, 1998).

Research on teacher self-efficacy evolved with studies going beyond the relationship between teacher self-efficacy and student achievement. Gibson and Dembo (1984) found evidence that teacher efficacy can serve as a motivational construct, where the level of efficacy affects the amount of effort a teacher will expend in a given teaching situation, as well as a teacher's persistence when faced with obstacles. In their studies, Gibson and Dembo related many new constructs to teacher self-efficacy, such as a teacher's attitude toward teaching, a teacher's openness to new ideas, and a teacher's

behavior in the classroom. In addition, Gibson and Dembo concluded that when a teacher's self-efficacy is shaped, variables such as school structure and organizational climate may play a major role (1984).

In current research on teacher self-efficacy problems are arising when self-efficacy is measured reflecting generalized attitudes about a teacher's capabilities bearing little resemblance to the task being compared (Pajares 1996). Bandura (1997) suggests that measuring general self-efficacy beliefs is problematic, showing little relevance to specific tasks to be accomplished. Teachers' sense of efficacy is not uniform across all teaching tasks or subject matters, and therefore researchers must be vigilant when measuring teacher self-efficacy (Bandura, 1997). In contrast, there also arises a problem of measuring teacher self-efficacy in too specific terms (Tschannen-Moran et al., 1998). For example, measuring the fact that a teacher believes he or she can teach simple addition in a rural setting to second grade girls with no learning disabilities poses little useful information to the study of teacher self efficacy (Tschannen-Moran et al., 1998.)

Four sources influence a person's level of self-efficacy: participation in mastery experiences, seeing similar individuals manage tasks successfully, social persuasion that one has the ability to succeed in a given activity, and stress reaction levels in relation to a person's emotional state (Bandura, 1994). A person's participation in mastery experiences are the most powerful source of efficacy information (Tschannen-Moran et al., 1998). For a person to participate in a mastery experience, he or she must be involved in modeling, guided practice, and transfer. Modeling is the first step to becoming competent at a task. Effective modeling teaches skills as well as strategies for dealing with problems that arise in a set task. Next, participants must be involved in

guided practice. Participants must utilize the information attained under the direct supervision of an expert where feedback is given and received. Finally, participants must be guided through a transfer process, where new skills are put into practice. During this time, skills can be implemented and problems can be discussed and resolved. To influence a person's self-efficacy, an individual must create experiences that bring success to that individual.

Seeing similar individuals manage tasks successfully also affects a person's self-efficacy. If a person observes the successful modeling of a task by an individual much like themselves, it can lead to that individual's believing that he or she can perform just as well on a set task as the model (Bandura, 1994). Furthermore, social persuasion can affect one's self-efficacy. People who are persuaded that they possess the abilities to master a given task are more likely to succeed (Bandura, 2000). Communities of professionals, as well as administrators, can provide the support and encouragement needed to alter one's self-efficacy. Finally, self-efficacy is affected by one's mood: positive mood enhances perceived self-efficacy (Bandura et al., 1996).

Tschannen-Moran et al., (1996), suggest two specific ways to influence a teacher's self efficacy: collective efficacy effects and leadership. Collective efficacy is defined as efficacy at the school level, or the extent to which efficacy is shared across teachers in a school building (Tschannen-Moran et al., 1998). Bandura (1993) found that the stronger the teacher's collective beliefs in his or her instructional efficacy, the better the school performed academically. In a study using high school data, a sense of community in a school was the single greatest predictor of teachers' level of efficacy (Lee, Dedick & Smith, 1991). Other elements that influenced teacher efficacy were

principal leadership and control granted to teachers within their own classrooms (Lee et al., 1991). In other words, “Schools where teachers work together to find ways to address the learning, motivation, and behavior problems of their students are likely to enhance teachers’ feelings of efficacy” (Tschannen-Moran et al., 1998).

Leadership also significantly influenced a teacher’s sense of self-efficacy. In studies where the principal displayed strong leadership, teachers’ collective sense of efficacy was greater (Fuller & Izu, 1986). In addition, studies have shown that in cases where principals encourage innovation and are responsive to the concerns of teachers, teachers’ collective sense of efficacy was also greater (Newmann, Rutter & Smith, 1989). In summary, a collective sense of self-efficacy within a school produces many benefits to that school, and principals can have a major impact on this collective efficacy by providing support and involvement in the building community.

Transformational and Transactional Leadership

In 1989, Blake and Mouton studied ways in which organizations could increase their effectiveness. Through this, they developed six criteria that serve as a blueprint for effectiveness. In order to be effective, an organization must have clear and strong objectives, have high standards of excellence, have a work culture that supports employees, utilize teamwork, have technical training provided through on the job training, and have effective leadership (Blake & Mouton, 1989). Stemming from this blueprint for effectiveness, Blake & Mouton developed the Managerial Grid (1989). Based on the knowledge that effective leaders must have concern for people as well as production, it scores a leader in both areas, ranging from a score of 1 (low concern for people and/or production) to 9 (high concern for people and/or production). The grid

shows that a leader with a score of 9.9, scoring high in concern for people and production, is the most effective leader. These leaders would foster employees who were committed to a common goal, and employees and leader would share trusting relationships. A leader who scored 5.5 on the Managerial Grid showed adequate performance in relation to concern for people and concern for production. This leader would have adequate performance through balancing efforts to get work done, while maintaining satisfactory morale. A leader who scored 1.1, low on both concern for people and production, shows minimum effort in getting tasks accomplished and minimum effort to sustain organization membership (Blake & Mouton, 1989)

Similar to the divisions of concern for people and concern for production by Blake and Mouton is the idea of transformational leadership versus transactional leadership. Built upon the assumption that the association with a higher moral position is motivating, and that collaborative work is more effective than individual work, Burns (1978) defined transformational leadership as a process by which “leaders and followers raise one another to higher levels of morality and motivation” (Burns, 1978, p.20). Burns also describes transactional leaders as leaders who motivated followers by appealing to followers’ self-interest (Burns, 1978).

Six practices being associated with the multidimensional nature of transformational leadership have been identified and described (Leithwood & Jantzi, 1990). Transformational leaders identify a clear vision, provide an appropriate model, foster the acceptance of collaboration and group goals, set high performance expectations, provide individualized support, and stimulate the intellect of employees (Leithwood & Jantzi, 1990). These characteristics associated with transformational

leadership clarify that the transformational leader is concerned with values, beliefs, norms, goals and feelings (Brown, 1993). Furthermore, the clear vision associated with transformational leadership must be that of the organization as a whole.

Transformational leadership is about working with others, respecting others, and encouraging the growth of others (Brown, 1993). Leithwood (1992) summarizes these characteristics by defining three fundamental goals of transformational leaders: helping staff members develop and maintain a collaborative, professional school culture, fostering teacher development, and helping teachers solve problems more effectively.

Transactional leadership, in contrast to transformational leadership, is more concerned with production than people (Blake & Mouton, 1989; Eden, 1997).

Transactional leaders exchange one thing for another (Eden, 1997; Turan & Sny, 1996). For example, workers complete daily tasks in order to receive a pay check at the end of a week. This idea contrasts with transformational leadership, where leaders look for potential motives in followers and seek to satisfy higher needs in order to engage the workers more fully (Turan & Sny, 1996). Some believe that transactional leadership practices aid in the recognition of what needs to be accomplished in an organization in order to reach a desired outcome (Leithwood, 1992). Furthermore, some believe that transactional leadership can increase workers' confidence and motivation (Leithwood, 1992). Many still see benefits in transactional leadership only when paired with characteristics of transformational leadership. Bass (1987) discusses transactional practices as being necessary to maintaining an organization, or getting daily tasks accomplished. However, transactional practices alone do not lead to systematic improvement (Leithwood, 1992).

In a study by Jantzi & Leithwood (1995), teachers' perceptions of their principal's use of transformational techniques yielded significant results. It was discovered that in-school conditions, such as the school's mission, vision, goals, culture, programs, resources, and policies, influenced teachers' perceptions of their principal's leadership behavior. Furthermore, it was found that the gender of the principal also impacted teachers' perception of leadership techniques. Female principals demonstrated a higher incidence of job satisfaction (Jantzi & Leithwood, 1995). Leithwood and Jantzi have also connected transformational leadership practices to the change of organizational conditions, and the impact of student engagement at school (2000). Furthermore, Bogler (2001) has linked a principal's leadership style to teacher job satisfaction. In a large-scale quantitative study, Bogler found that teachers prefer to work with a principal who exhibits a transformational type of behavior rather than a transactional one (2001). Transformational leaders were found to maximize the autonomy of teachers, therefore increasing their job satisfaction (Bogler, 2001; Sergiovanni, 1990).

Many studies believe that the most effective leader shows characteristics of both transactional and transformational leadership (Day, Harris & Hadfield, 2001; Eden, 1997; Smith, 1993). Smith (1993) displays five stages of leadership that a principal must process through: temporal leadership, transactional leadership, transitional leadership, transformational leadership, and total leadership. In the total leadership stage, a leader understands and acknowledges the positive and negative aspects of each of the earlier stages, and uses this knowledge to become a total leader (Smith, 1993). Other researchers agree and state that when transactional strategies, such as bargaining, rewards and sanctions are used in conjunction with the transformational techniques of building

esteem, autonomy and aspiration, leaders are most successful (Day, Harris & Hadfield, 2001; Eden, 1997).

The Role of the Principal

Leadership is a primary factor in establishing and maintaining successful professional development (McLaughlin, 1991). In order to facilitate a successful professional development opportunity for teachers, principals must play a key role in the support of the endeavor (Little, 1993, McLaughlin, 1991). School principals are the primary focus of creating expectations and norms related to teacher professional development (McLaughlin, 1991). Principals must set high standards for teachers in terms of professional learning and must remain visible through professional development trainings (Morrissey, 2000). Furthermore, Little (1993) concludes that professional development sessions are most effective when collaboration takes place, and effective principal leadership is present.

Newmann, King & Youngs, (2000) identify five factors which influence a school's capacity to flourish: knowledge, skills and dispositions of individuals, professional communities, program coherence, technical resources, and principal leadership. Effective principal leadership is that which causes the other factors to improve (Newmann, et al., 2000). Effective leadership, in other words, is that which enhances teacher development, promotes professional communities, promotes program coherence, and allows access to valuable resources. With this knowledge, effective schools have built professional learning communities where principals and teachers collaborate to foster school improvement (Fullan, 2003).

In a recent study by Morrissey (2000), professional learning communities in schools were explored to determine trends to successful implementation of a collaborative effort. In this study, it was determined that principals can encourage collaboration of teachers using several techniques (Morrissey, 2000). It was determined that principals play a critical role in nurturing the development of collaboration in professional learning communities by providing conditions and resources to support learning (Morrissey, 2000). Specifically, principals maintained high expectations for teacher and student learning. Poor performance was not acceptable to the principals, and high expectations were voiced and modeled by their own leadership (Morrissey, 2000). In addition, principals maintained a “visible and knowledgeable presence” in their schools, interacting with teachers on a daily basis (Morrissey, 2000, p.36). Principals utilized e-mails to maintain communication and used tactics such as school newsletters and bulletin board postings to provide encouragement to their teachers (Morrissey, 2000).

In professional learning communities where the principal and teachers work together, active learning occurs and professionals work together to solve school problems (Fleming, 1999). In order to create these successful communities, principals concentrate on two conditions: the structure within the school, and the relationships between people at the school (Fleming, 1999). Through these efforts, principals encourage teachers to believe in the value of teamwork and the achievement of students. Principals can use their leadership roles to build communities of teacher-learners to encourage collaborating and continued learning for all staff members (Fleming, 1999). In short, a principal’s leadership enables or disables teachers’ learning and professional growth (McLaughlin, 1991).

In a recent study by Blase and Blase (2000), American teachers were asked to identify and describe characteristics of principals that enhanced their classroom instruction. Through this study, teachers described the impact that the characteristics of their principals had on them. Blase and Blase (2000) were able to identify two themes of effective instructional leadership. An effective instructional leader promotes reflection and promotes professional growth. To promote reflection, effective principals used five strategies. They made suggestions, gave feedback, modeled best practice, used inquiry, solicited opinions, and gave praise (Blase & Blase, 2000). To promote professional growth, principals used six strategies. They emphasized the study of teaching and learning, supported collaboration efforts among teachers, developed coaching relationships among teachers, encouraged the redesign of programs, applied the principles of adult learning and development to staff development programs, and implemented action research to inform instructional decision making (Blase & Blase, 2000). In summary, the findings of Blase and Blase (2000) suggest that effective instructional leadership is embedded in the culture of the school. To promote a positive culture in their school, effective principals should avoid intimidating approaches to teachers and give way to the promotion of collaboration and collegiality among teachers.

Similarly, Fink and Resnick (2001) describe activities that promote effective instructional leadership. These activities include investing in learning communities and peer learning. Fullan (2002) believes that these characteristics of effective leadership do not go far enough. “The role of the principal as instructional leaders is too narrow a concept to carry the weight of the kinds of reforms that will create schools that we need for the future” (Fullan, 2002, p. 16). Fullan (2002) further suggests that principals must

now lead a cultural change. In order to do this, principals must have strong moral purpose, understand the process of change, improve relationships among teachers, promote knowledge creation and sharing among teachers, promote learning in context, and cultivate leaders at many levels (Fullan, 2002).

Principals with moral purpose seek to make a difference in the lives of their teachers and their students. This idea goes beyond a principal's school into his or her vision of the education of students as a whole: closing achievement gaps and looking at the bigger picture of the educational system (Fullan, 2002). "The single factor common to successful change is that relationships improve" (Fullan, 2002, p. 18). In order to promote collaboration and improve the professional growth of teachers in a school, relationships within that school must improve (Fullan, 2002). Teachers must collaborate, sharing and creating knowledge together, and act as peer coaches to one another. This collaboration describes cultivating leaders at many levels: collaborative learning, peer coaching, and learning in context fosters the cultivation of leaders at many levels (Fullan, 2002). Bolman and Deal (2002) also agree that a principal must go beyond simply being an instructional leader. A leader must go further to possess five qualities: focus, passion, wisdom, courage and integrity (Bolman & Deal, 2002). With each of these characteristics, an instructional leader goes beyond making a school function, to making it flourish.

Effective instructional leaders, in addition to promoting collaboration, and going beyond the traditional roles of a principal, also emphasize teacher learning (Darling-Hammond, 2003a, 2003b, Elmore, 2004, Fullan, 2002). Principals must encourage teacher professional development that is sustained and connected to other aspects of

school change (Darling-Hammond, 2003a). Furthermore, principals must allow for professional development that is job-embedded. Fullan (2002) discusses the importance of learning in context, professional development that is rooted in the experiences and needs of teachers. This learning is “designed to improve the organization and its social and moral context” (Fullan, 2002, p. 18). Elmore (2002) goes further to discuss how instructional leaders must model this learning in context. Principals must model best practices and be prepared to continue their learning as well as encourage the learning of their teachers as professionals (Elmore, 2004).

Current research on the principal’s role in school leadership suggests that to promote teacher learning and to prevent teacher attrition, principals must build interpersonal relationships between and among teachers (Blase & Blase, 2000; Bolman & Deal, 2002; Fleming, 1999; Fullan, 2002; McLaughlin, 1991, Morrissey, 2000), and must emphasize the importance of continued teacher learning (Elmore, 2002, Fullan, 2004, Darling-Hammond 2003b). Going beyond the traditional role of instructional leaders, principals must influence teachers by engaging in new practices and incorporating new beliefs (Fullan, 2004). In short, successful principals strive to foster healthy school climates by promoting collaboration and fostering teachers’ professional learning (Drago-Severson, 2005).

Communities of Practice

Communities of practice are one focus of research in association with teacher collaboration and professional development. Communities of practice are groups of people in a professional environment who come together to share expertise and experiences for a given profession or topic (Wenger & Snyder, 2000). Communities of

practice have been successfully used in classroom settings, allowing groups of students to research, share information, and perform tasks collaboratively (Brown, 1997). In addition, communities of practice have been used to facilitate collaboration with adults. The idea of individuals working in communities to promote more effective practice in the workplace is not new. The idea of communities of practice has roots in the Anthropological views of Situativity Theory (Barab & Duffy, 2000). These views explore the idea of individuals being shaped by their experiences in a community of practice (Barab & Duffy, 2000). In contrast to focusing on cognition and situated learning, individuals participating in such a community strive to develop a new identity as a result to the relationships built within the community. In addition, the focus of the community does not stop when a single task is completed, but rather the focus is on developing new meanings and solutions to overall problems in the environment in which the community members work. Therefore, a community of practice goes beyond the traditional psychological views of individuals working together to perform a specific task (Barab & Duffy, 2000).

Several theories exist to discuss what constitutes a community of practice. Barab and Duffy (2000) define three characteristics of a community: common cultural and historical heritage, interdependent systems, and reproduction cycles. Individuals of a community must share goals, meanings and common practices in the workplace; they must be interconnected with a larger community (i.e. the educational community); and members must be able to join a community after it has been established (Barab & Duffy, 2000). Sherer, Shea and Kristensen (2003) also define three characteristics of a community of practice: the domain, the community and the practice. Members must

possess competence in a specific domain, or focus area; members must interact between and among each other; and members must share a practice, or share experiences and expertise in handling common difficulties in the workplace. Perhaps most widely recognized, however, are the three essential features of a community of practice: a set of issues, a group of individuals who are concerned with these issues, and an interest in finding an effective approach to addressing these issues within the context of the community (Van Note Chism, Lees & Evenbeck, 2002; Wenger & Snyder, 2000).

Focus of Communities of Practice

Although many researchers have varying views on what defines a specific community of practice, common to all theories is the emphasis on dialogue between participants about knowledge and practice (Wesley & Buysse, 2001). Communities of practice strive to bring individuals with varying expertise together by bridging the gap between research, policy and practice (Wesley & Buysse, 2001). Within these communities, there is no clear boundary between developing skills and developing new identities as leaders in a field. Both occur as the community interacts (Barab & Duffy, 2000). In short, participants in a community of practice learn together by focusing on problems that are directly related to their work. “In the short term, this made their work easier or more effective; in the long term, it helped build both their communities and their shared practices- thus developing capabilities critical to the continuing success of the organizations” (Wenger & Snyder, 2000). In the educational field, the emphasis of communities of practice has changed from simply defining what a community is, to creating communities for the purpose of improving current practices (Palincsar, Magnusson, Marano, Ford & Brown, 1998 as cited by Wesley & Buysse, 2001). Wenger

and Snyder (2000) discuss the six major benefits of communities of practice: communities help drive strategy, communities start new lines of business, communities solve problems quickly, communities transfer best practices, communities develop professional skills, and communities help companies recruit and retain talent.

Scarcity of Communities of Practice

Addressing the numerous benefits of effective communities of practice leads to the question: why are these communities not more prevalent in the workplace? Wenger and Snyder (2000) define three reasons for this paradox. The term community of practice is relatively new to the business world. Although informal communities have existed for many generations, organized, defined structures of communities are new. Secondly, many industries do not wish to nurture communities of practice.

To develop the capacity to create and retain knowledge, organizations must understand the processes by which these learning communities evolve and interact. We need to build organizational and technological infrastructures that do not dismiss or impede these processes, but rather recognize, support and leverage them (Wenger, 1998).

Without the proper support from a company or infrastructure, communities cannot thrive. And lastly, communities of practice are difficult to build within an organization. As discussed by Wenger and Snyder (2000), communities of practice are “resistant to supervision and interference” and therefore difficult to maintain within a well-structured organization. Barab and Duffy (2000) discuss a centralized goal of communities of practice as individuals developing a sense of self in relation to society--a society outside of the classroom. The informal nature of communities of practice and of individuals' participation in them makes communities not only difficult to establish, but also difficult to maintain (Wenger & Snyder, 2000).

Wesley and Buysse (2001) discuss four possible opportunities for fostering and developing communities of practice despite the difficulties addressed above. The first approach is to introduce the community of practice framework to a group of professionals who are already meeting. The second is to incorporate a community of practice into an existing professional development program. The third is to offer incentives to communities who sustain their efforts over time. And the last is to share ideas that emerge from the communities with the larger population of professionals. These four opportunities are the first steps to incorporating communities of practice into the educational field.

Using Communities of Practice

Trentin (2001) describes five assumptions of communities of practice. First, learning is a social phenomenon, where learning in communities is more effective than learning alone. Second, participants in communities share beliefs and values in which knowledge is integrated. Third, within communities of practice, the process of learning and the process of participating are not independent of each other. Fourth, knowledge and practice are not independent of each other. Lastly, a community member's ability to share expertise and contribute to a group of professionals creates the potential for learning.

Using communities of practice within a workforce can transform the way in which communication and professional growth occur among employees.

One way in which the approaches differ is in the ability of communities of practice to transcend organizational and geographical boundaries. Members of a community of practice may represent a variety of backgrounds and organizations, but there exists a common set of core issues that binds the members together into a single community" (Wesley & Buysse, 2001).

One way to use a community of practice is by utilizing the technology available in most educational systems today to create virtual communities of practice. Learning at a distance should strive to have some degree of online activity among participants, emphasize collaborative learning, and provide ongoing support for participants (Trentin, 2001).

These assumptions not only define communities of practice, but also give a starting point to developing an online community of practice. Trentin (2001) also describes two situations in which online communities of practice can enhance collaborative learning. Follow-up training from professional development opportunities is a common complaint among teachers. In addition, teacher professional development often leads teachers to learn in isolated conditions, working on formal activities where the focus of the training is often the acquisition of knowledge (Schlager, Fusco & Schank, 1999). By creating an online community of practice that follows the five assumptions above, follow up training, not only by experts, but also by peers in the field, can be given to trainees. In addition, professional development can become a communal experience, allowing teachers to participate in meaningful, collaborative discussions that are focused on solving daily problems, not on acquiring basic knowledge.

Trentin (2001) also states that “the need to create communities of professionals based on the concept of knowledge sharing/knowledge management” is one way in which an online community of practice can promote better practice (Trentin, 2001, p.11). In technology professional development, follow-up training or knowledge sharing, teachers can benefit from the support that is present in an online community of practice.

Schlager, et al., (1999), through the development of an online community entitled TAPPED-IN, have established four concepts that create successful online community experiences. First, online communities should support an informal flow of knowledge among professionals, much like face-to-face communities would foster. Secondly, in order for an online community of practice to be successful, several organizations and several perspectives on learning should be included. Thirdly, the community must not become isolated. An online learning community must promote growth through activities and services offered that are not limited by one set of ideas or one facilitator. Finally, teacher professional development is a life-long process that does not occur in isolation, but rather in the context of daily practices. These ideals give yet another framework to promote effective online communities, as well as create an environment that alleviates problems associated with traditional teacher professional development.

Problems Associated with Online Communities of Practice

Online communities of practice require technical knowledge and assistance from experts that some school systems lack. Network-based communication is not often used in today's school systems, and online communities of practice cannot be created without the knowledge of such technical systems (Trentin, 2001). If the obstacle to creating and understanding a network-based communication system is overcome, school systems must also maintain these communities. Qualified facilitators and experts are critical in the success of online communities of practice (Trentin, 2001). Facilitators are present not to lead discussions, but often to summarize discussions, provide expertise, and archive discussions. .

Although online communities of practice are convenient, in order for a community to be successful, it must be comprised of a real community of professionals (Trentin, 2001). This fact creates the problem of face-to-face meetings between the members of a community. As discussed, community members may spread across distances, or may be comprised of teachers in a single school district. Whatever its composition, community members must ground their experiences and discussions by physically meeting occasionally. Finally, members of an online community must be technologically proficient to gain all of the benefits associated with an online community. If participants lack skills needed to participate in an online community, they may become frustrated with the process. Such frustration could lead to negative experiences with the process of online communities of learners (Schlager, et al., 1999).

Benefits of Online Communities of Practice

Online communities of practice are learning groups in which professionals can share experiences and identify best practices associated with daily problems encountered in a work environment (Trentin, 2001). In conjunction with the benefits of face-to-face communities, online communities allow participants to share information and participate in discussions at their convenience. “The erosion of physical limits and of sense and identity frontiers has given rise to non-centralized and flexible computer mediated narratives that allow their authors to communicate in the cyberspace as if they were involved in some kind of social interaction” (Dias, 1999, p. 168). By removing the physical limitations of traditional communities of practice, participants can have an added benefit, the social interaction that facilitates learning, not hindered by place or time constraints. Web-based learning is dependent on virtual social interaction as well as the

instructional practices typically associated with communities of practice (Dias, 1999). This social interaction can be facilitated by creating a community of practice that transcends time and space.

Online communities of practice combine the benefits of traditional communities without the time constraints that are often laid upon teachers. Communities, combined with computer mediated communication technology, can help redefine professional development and teaching (Sherer, et al., 2003). In summary:

The web-based learning communities will be the places for knowledge simulation. They are bound to recreate the existing social tie with knowledge in regard to the building up of a collective intelligence that moves from the physical space into the virtual one and from the information model into the knowledge one. This will lead us into the spread of a Knowledge Society (Dias, 1999, p. 169).

In order to facilitate these practices, online communities of practice should be established as follow-up training, or established as a knowledge sharing system within the educational system (Trentin, 2001). This addition to existing professional development experiences may alleviate problems associated with teacher satisfaction with professional development.

In Conclusion

During the past 20 years, professional development in education has gone through several changes. Three new powerful ideas are altering the way America's schools offer professional development: results-driven education where the professional development success is measured by improved performance of teachers and students, systems thinking focusing on large-scale reform rather than traditional software training, and constructivism, building knowledge rather than receiving it (Sparks, 1994). Although many models for effective professional development have been developed and researched

(Kelleher, 2003; Lan et al., 2000; Salpeter, 2003; Sparks & Loucks-Horsley, 1989; Taylor & Walls, 2005; Wood et al., 1993), many of these models are built upon the same assumptions of effective professional development.

Five characteristics of effective professional development are the building blocks of professional development models. First, professional development must be ongoing (Salpeter, 2003). Single session trainings are not effective for adult learners. Secondly, effective professional development must utilize teamwork (Salpeter, 2003). By learning in collaboration with one another, teachers feel less isolated (Salpeter, 2003). Third, effective professional development must have clear objectives and measurable criteria for learners to achieve (Rogers, 2002). Goals must be set at the initiation of a professional development experience in order for teachers, administrators, and professional development trainers to be clear on the task at hand. Fourth, professional development is most effective when job-embedded (Kelleher, 2003). When taken out of context, the content training sessions are less likely to be implemented in the classroom. Lastly, training sessions must be followed up with support and mentoring in order to sustain change (Fullan, 2004; Salpeter, 2003). The support of administrators plays a key role in the successful implementation of a professional development experience (Little, 1993; McLaughlin, 1991; Rogers, 2004).

Teacher self-efficacy, or the teacher's beliefs about his or her capabilities to perform at a given level, is significant (Bandura, 1994). In a professional development setting, teacher self-efficacy can impact his or her performance within the training, as well as his or her performance when the training is complete (Pajares, 1997). Collaboration, as well as strong administrative leadership can impact a teacher's beliefs

about his or her capabilities in the classroom (Tschannen-Moran et al., 1998). With an improved sense of community within a school, as well as strong leadership, a teacher's sense of efficacy can be improved, therefore causing teachers to perform better within a professional development experience, in addition to the benefits taken from that professional development experience. By establishing a collaborative community and supporting that community, principals can guide and support the learning of their teachers.

Developing and fostering online communities of practice is one way in which to foster collaboration and teamwork in a teacher technology professional development experience. When teachers learn collaboratively, technology professional development can be more effective (Johnson, 1981; Liaw & Huang, 2000; Parr, 1999). Communities of practice are not often used in educational settings because they are too difficult to introduce and too difficult to sustain (Wenger & Snyder, 2000). However, communities of practice in a school setting allow teachers to collaborate with other professionals, allowing a professional development session to be more effective (Little, 1993).

One way to phase in communities of practice is to introduce the community of practice framework to a group of professionals who are already meeting (Wesley & Buysse, 2001). Here, professionals are already working together, but can now have a new tool to foster collaboration and learning. In addition, communities of practice can meet online, removing the time constraints that often hinder teachers. By developing communities of practice through professionals who are already meeting, as well as by allowing communities to meet online, knowledge can be shared virtually. These considerations will allow teachers to move from professional development in which

information is acquired, to professional development in which knowledge is constructed
(Dias, 1999).

CHAPTER THREE

RESEARCH METHODOLOGY

Research Design

This study was designed to develop an understanding of professional development given at two middle schools. Cases were compared on initial school climate, principal participation in an online community of practice, teacher reactions to principal participation and changes in teacher self-efficacy. The design of this study was a within-stage mixed model research design (Johnson & Christensen, 2004). Quantitative and qualitative research approaches were combined at several stages of research through the use of multiple-case, or comparative case studies (Yin, 2003). The case study method allowed the researcher to focus on contemporary events, while allowing for the lack of control of behavioral events within the research setting (Yin, 2003). The case study approach gave insight through rich description into a professional development experience involving online communities of practice that incorporate principal participation (Gall et al., 1996).

Before the study began, a school climate survey was given to describe areas of school climate: professional values, emphasis on learning, collegiality, collaboration, shared planning, and transformational leadership (Cavanaugh & Dellar, 1997). Qualitative data were analyzed to explore teachers' and principals' beliefs and responses to the professional development, as well as the discussion and interaction among teachers and principals in an online community of practice. Principal and teacher attitudes were explored, gaining insight into their perceptions of the strengths and challenges of the professional development experience. In conjunction with the collection of qualitative

data, a survey was administered at the opening and closing of the experience to measure teachers' levels of self-efficacy as it relates to the success or failure of the professional development experience. Because survey designs alone are limited in describing a phenomenon within a context, the survey was used only as part of the comparative case study design (Yin, 2003). Self-efficacy changes, as well as qualitative data gathered through a content analysis of online discussions, interviews, focus groups, and teacher self-reports, were used to explore the effects of the professional development experience. Data were collected during, before, and after the professional development experience. Before the study began, approval was obtained from the University's Institutional Review Board as well as the participating district's administrators.

Participants

The participants in this study were two middle schools in a community located in the mid-south. Homogeneous purposeful sampling was used to select two similar schools in a school system that could best provide insight into the use of an innovative approach to professional development that paired face-to-face professional development with an online community of practice. Participants from each school included principals, and sixth, seventh, and eighth grade teachers of core subjects such as English, language arts, math, science, and social studies. Teachers at the two schools lacked the competency to successfully integrate technology into their teaching practices. Only nine percent of teachers at the participating schools had participated in the state's technology integration fifty-two hour professional development program. The demographics of each school are displayed in Table 3.1. Demographics of teachers within the two schools are displayed in Table 3.2.

Table 3.1
Demographics of Cases

	Bayside Middle	Creekhollow
Number of students	427	336
Percent of regular education students	88%	85%
Percent of students with disabilities	12%	16%
Percent of students on free or reduced lunch	22%	45%
Attendance rate	95.1%	95.1%
Dropout rate	0.0%	0.4%
Number of teachers in grades 6-8	24	16
School performance score	111.9	102.8

Table 3.2
Teacher Demographics

	Bayside	Creekhollow
Mean years of experience	15.2	12.1
Mean years at current school	7.8	5.4
Mean number of students per class in grades 6-8	21	24

Before the study began, a school climate survey was administered to teachers at both schools to equate the schools on various areas of school culture including leadership, collegial relations, collaboration, commitment and professional relations (Cavanaugh & Dellar, 1997). Means for each area of school culture measured are presented below in

Table 3.3

Table 3.3
School Climate Analysis

Factor	Bayside Middle	Creekhollow
Leadership	2.04	1.89
Collegial relations	1.57	1.39
Collaboration	1.49	1.56
Commitment	1.95	1.93
Professional relations	2.32	2.37

*scale 1-5

A MANOVA was used to test the null hypothesis that there was no significant difference between the schools on the above five factors, leadership, collegial relations, collaboration, commitment, and professional relations. When testing for the main effect of school on the 5 dependent variables, there was no significant effect, (Wilks' lambda =

.87; $F_{(5,30)}=.927$; $p=.48$). Univariate tests for each factor also indicated that there were no significant differences between the two schools on any of the individual factors. As a result, the schools were considered to be comparable in terms of the factors measuring school climate. In addition to this survey, and in order to increase the transferability of this study, characteristics of each school are described below.

Case A: Bayside Middle

Bayside Middle is located in a small town with students in grades five through eight. Details of each school, according to the School Report Card for Parents, are outlined above in Table 3.1. Bayside Middle received a School Performance Score of 111.9. A school's performance score is based on student achievement on the LEAP 21/GEE 21 standardized tests, the Iowa standardized tests, student attendance, and student dropout. A score of 111.9 gives Bayside the distinction of three stars. Schools with a School Performance Score between 100 and 119.9 receive three stars. The highest distinction is five stars for a school receiving a School Performance Score of 140 and above. Bayside also received the title of minimal academic growth. This title is given to a school that is improving at least 0.1 points on the school performance score, but fails to meet its growth target.

On each section of the LEAP 21 standardized test, including English/Language Arts, Mathematics, Science and Social Studies, eighth grade students at Bayside Middle scored above the district, as well as the state average. Similarly, students in grades six and seven taking the IOWA standardized tests scored above the district and state averages.

Teacher quality is also addressed in the School Report Card. Ninety-five percent of teachers at Bayside teaching core courses are highly qualified. To be considered highly qualified, teachers in grades six through eight must, in addition to their teaching certificate earned, do one of the following: pass the state subject-specific licensing examination for middle school academic content area; achieve National Board certification in the content area, complete coursework equivalent to an academic major in a content area, earn a Master's degree in a content area for every core subject taught, or attain ninety Continuing Learning Units (CLU's) by the end of the 2005-2006 school year. In regards to school climate, the School Report Card identifies that Bayside has a written parental involvement statement, a student code of conduct, as well as a crisis management plan.

Upon entering Bayside to begin the first day of professional development, I was greeted with a warm atmosphere of an older, well-established middle school. The school is a much older school, having alumni that are now seventy years old. It is placed on a large campus filled with areas for student activities such as football and basketball. Although noticeably one of the district's older schools, the brightly colored outside bulletin boards strove to welcome newcomers expressing positive student messages such as: "Give me five: be nice to five people today." Having met with the principal, Ms. McGrew, only twice, I immediately stepped into the front office to make my presence known. Alive with students checking in late and morning announcements, the front office appeared smaller than most, but still bright with enthusiasm and praise for students and faculty. Ms. McGrew greeted me with a warm smile and open enthusiasm for the experience that was about to begin. She reminded me of the schedule of professional

development sessions, and then escorted me to the school's library, where I would be stationed. The library is located two doors down from the front office and is filled with shelves full of various types of books. Labels such as 'fiction' and 'nonfiction' organized the walls, and many computers are provided, allowing children to conduct research on the Internet.

Although stationed in the library, each professional development session took place in different areas. The first session took place in the classroom of a second year teacher. Upon entering the classroom, the age of the school became evident. Although this site was equipped with a mobile lab, consisting of 30 computers all connected wirelessly to the Internet, the colorful, cheerful atmosphere of typical classrooms was not present. Posters decorated the walls with school rules, fraction words, and classroom bell schedules, but the room was void of colorful bulletin boards or posters. The second session took place in the school's only computer lab. This lab consisted of twenty-eight computers, most of which line the walls of the room that are all linked to the school's network and the Internet. Although the age of the school was also evident in this room, motivational posters hung on the wall. Harry Potter exclaimed that learning was fun, and posters gave examples of how to use the Internet safely. The final session took place in a classroom adjacent to the computer lab, where a second mobile lab was used. Although this room was void of colorful, witty decorations as well, it gave off an air of excitement. In this classroom, a computer grant is being carried through, where students are using computers for electronic journaling and Internet research. On the board were written many instructions for the new tools, and many new rules concerning the use of these tools.

Case B: Creekhollow

Creekhollow is located in a similar small town in the South. Creekhollow educates students in grades pre-kindergarten through eighth grade. According to the School Report Card for Parents, Creekhollow received a School Performance score of 102.8. Although lower than Bayside's score of 111.9, Creekhollow also received the distinction of a school with three stars. Creekhollow was also labeled as attaining minimal academic growth. Students in grade eight took the LEAP 21 achievement test. Similar to Bayside, students at these grades scored above the district and state averages in English/Language Arts, Mathematics, Science, and Social Studies. Students in grades six and seven took the IOWA performance test. Students in grade seven scored above the district and state average, and students in grade six scored above the state, but not the district average. According to the school report card, 98% of teachers teaching core courses are highly qualified. In regards to school climate, Creekhollow also possesses a written parental involvement statement, a student code of conduct, and a crisis management plan.

As I entered the main building of the perfectly manicured Creekhollow for the first day of professional development, I was struck with the simplistic beauty of the buildings. The school had just entered its tenth year and still appears to be very new. Its pristine floors, beautiful landscaping, and overall clean and crisp appearance made me feel welcomed. Upon entering the office, I was greeted with the typical school morning. Students with runny noses were asking to call their moms, and parents who had overslept were bringing their children to check into school late. Ms. Morel, principal of Creekhollow, welcomed me with a business-like handshake and escorted me to the

middle school library. Because Creekhollow houses students in grades pre-kindergarten through eight, this year, a new library, dedicated only to students in grades five through eight, was built. A smaller library, Creekhollow's new middle school library was filled with shelves of books, an audio-visual room, a teacher resource room, and six computers, all connected to the school's network and the Internet. The library has six tables and chairs in the center, and gives the appearance of being a place where students must remain quiet, not touch the books with dirty hands and must push in their chairs before leaving. Because of the library's schedule, this is where I would be conducting two of the three sessions. Having a schedule conflict, Ms. Morel asked me to conduct the first session in the school's computer lab. Giving the appearance of not being as new as the library we just left, but still in perfect condition, the computer lab is set up to promote collaboration of students while using technology. Computers are set on five round tables, each consisting of six computers with headphones, all connected to the school's network, Internet, and a laser printer. With a desk and a dry-erase board in the front of the lab, the computer lab gives the appearance of being used often, with a schedule of teacher's names and times reserved, left-over assignments written on the board, and student papers forgotten in the printer.

Procedures

The following describes the procedures of the study. The results of the needs assessment are given, as well as descriptions of each face-to-face professional development session, and a description of the design of the online community.

Sequence of the Study

Table 3.4 summarizes the key phases of this proposed study.

Table 3.4
Research Study Phases

Phase	Description
Request IRB approval	Submit appropriate forms to IRB
Pilot self-efficacy instrument	The survey was administered to teachers in four area middle schools.
School climate survey	School climate survey was used to evaluate schools on six elements: professional values, emphasis on learning, collegiality, collaboration, shared planning, and transformational leadership.
Pre-assessment of self-efficacy	Self-efficacy survey was administered to assess teachers' level of self-efficacy in four areas: attitude toward using computers as instructional tools; attitude about the need for technology professional development ; competence with using technology as an instructional tool; and confidence in utilizing new innovations
Implementation of professional development	Four weeks of professional development that incorporates face-to-face technology and online discussions was completed.
Post-assessment of self-efficacy	Self-efficacy survey was re-administered to assess teachers' level of self efficacy in the same areas following the professional development experience. Self-reports were administered at the middle and end of the experience.
Conduct interviews	Interviews with each principal were conducted.
Conduct focus groups	One focus group was conducted with the members of each team of teachers who participated in the study (a total of six).

Face-to-Face Sessions

At each school, the participating teachers took part in a professional development session that met twice a week for four weeks, for a total of eight sessions. Teachers met at teaming periods, daily forty-five minute blocks dedicated to teachers of one grade level working together. Typical topics of discussion included the state's new Comprehensive Curriculum, special needs students, parent-teacher conferences, principals meetings and paperwork. The new Comprehensive Curriculum is an innovative curriculum guide being implemented in all K-12 schools this year. Based on grade-level expectations (GLE's), or statements of what all students should know or be able to accomplish by the

end of each grade, the curriculum is divided into units of study within each major subject, and identifies guiding questions, GLE's, sample activities, and assessment options for each unit.

A needs assessment to determine the content of the professional development was conducted in three phases. First, the researcher asked each principal to identify specific needs of their teachers that may be addressed in this session. Both principals identified a desire for teachers to collaborate across subject areas during instruction. However, one principal discussed the difficulty of collaboration across subject areas due to the state's new Comprehensive Curriculum. Both principals' main concern was that of teachers' using this new curriculum and getting the support needed to transition from the old curriculum guides to the new Comprehensive Curriculum.

Some district leaders have taken action to support this transition. In the district in which the research is being conducted, each school has been assigned a teacher-coach. These veteran, award-winning teachers, support teachers' efforts of using the new Comprehensive Curriculum. Teacher coaches typically met with each team of teachers once a week, discussing topics such as the mapping of curriculum, assessment using the new curriculum, standardized testing, and using higher-order thinking skills with students.

Phase two of the needs assessment was conducted with the schools' teacher-coach. When discussing the needs of the teachers and how these needs should be addressed, the teacher coaches discussed the need for technology integration into the new Comprehensive Curriculum. One of the teacher-coaches stated that teachers are receiving isolated training: support from teacher-coaches on the new curriculum and

isolated technology professional development. If the study could incorporate technology professional development into the Comprehensive Curriculum, teachers could receive technology training that is integrated into their new, demanding curriculums.

When speaking with teachers in phase three of the needs assessment, it was found that teachers were overwhelmed with the new demands placed upon them in relation to the new Comprehensive Curriculum. Teachers agreed that they lacked integrated professional development using technology with the new curriculum. Teachers also expressed a desire to collaborate with other teachers teaching the same subject and grade level to create a unit that addresses technology within the Comprehensive Curriculum.

Teachers were next given a survey, created by the researcher, asking about how competent teachers felt they were, and how teachers valued five types of instructional technology tools: technology instructional tools, presentation media, student publishing media, using spreadsheets, using basic directed browsing activities, and using advanced directed browsing activities (Appendix 5) . Each teacher was asked to rank their competency in each of these tools with values of one being not competent and three being very competent, as well as the instructional value they felt it had, one being not valued and three being that the tool was highly valued. Results are summarized in Table 3.5:

Table 3.5
Needs Assessment Results

Technology Instructional Tools	Competency Level*	Potential Value**
Presentation media	1.47	1.21
Student publishing media	2.24	1.45
Using spreadsheets to create charts, graphs, and timelines	2.18	1.42
Basic directed browsing activities, Internet safety	2.81	1.34
Advanced directed browsing using Internet resources	2.55	1.39

*1, very competent-3, not competent

**1, high value-3, little or no value

Based on the results of the needs assessment, as well as the technology availability at each school, the technology professional development sessions had three goals. The first goal was for the teacher to identify areas in the Comprehensive Curriculum that may benefit from technology integration. This identification allowed teachers to envision using new technology instructional tools with the curriculum that is now mandated. This goal was designed to aid in the development of teachers' attitude toward using computers as instructional tools. The second goal was for teachers to become familiar and gain proficiency using technology applications. Specifically, teachers would explore how to use spreadsheets to create charts, graphs and timelines, and explore how to allow students to safely research material on the Internet by using directed browsing activities. This proficiency allowed teachers' to become more competent in using new types of instructional technology tools. The third objective was for the teachers to design a collaborative unit plan that crosses two subject areas and also address the new Comprehensive Curriculum, while integrating technology into that unit plan.

Professional development sessions took place two days per week for four weeks during the teachers' forty-minute teaming period. Each day, teachers participated in various activities including professional development sessions, specialized meetings, and conferences during their forty minute teaming period. For this study, teachers met twice a week for technology professional development during this time. Table 3.6 summarizes the focus for each of the eight professional development sessions.

Table 3.6
 Teacher Professional Development Sessions

Session Number	Focus
1	Introduction to Technology Integration: NETS-T, NETS-S Conducting Integrated Research projects with technology: introduction Introduction to Blackboard
2	Integrating technology into the Comprehensive Curriculum: choosing areas for integration
3	Integrating technology into the Comprehensive Curriculum: choosing areas for integration, Presenting knowledge using Microsoft Excel
4	Researching using Trackstar
5	Developing WebQuests
6	Developing WebQuests
7	Writing a technology enhanced, integrated unit plan
8	Writing a technology enhanced, integrated unit plan

The goal of the first professional development session was to provide an overview of the professional development and establish a framework for all subsequent sessions. Specifically, teachers discussed the National Educational Technology Standards (NETS) for teachers and for students, received copies of these standards and identified standards they believed most valuable for their students, and were also introduced to Blackboard and the purpose of the online community (ISTE, 2005). At this time, teachers received all supplemental materials, including NETS, technology enhanced unit plan template and checklist, contact information, schedule of events, and quick tip sheets on each of the programs to be used. A copy of all support material can be found in Appendix 1.

In the second and third face-to-face professional development sessions, teachers worked in teams to identify areas of the Comprehensive Curriculum where technology could enhance learning. Working together, science and math teachers, as well as social studies and language teachers, identified areas of the curriculum that could be used to design a technology enhanced, integrated unit plan. The third session also introduced

teachers to Microsoft Excel, and its capabilities for charting and graphing information attained by students, as well as its capabilities for creating timelines.

The fourth session introduced the teachers to Trackstar. This user-friendly website allows teachers to create lab activities to direct the research of students while on the Internet. The fifth and sixth sessions were dedicated to WebQuests, interactive tools designed to allow students to use the Internet to gather information, and create a product. Teachers were introduced to the various components of a WebQuest, and designed their own WebQuest, in groups, through the use of a template.

The final two face-to-face sessions were dedicated to teachers' writing a technology-enhanced, integrated unit plan. Because these sessions were held during planning periods, teachers from various subjects teaching the same grade level attended sessions together. Teachers from math and science collaborated, as well as teachers from social studies and language arts. Using the areas of the Comprehensive Curriculum identified in the first week of professional development, as well as technology tools learned in the sessions, teachers created a unit plan using the template provided by an educational technology resource page through the state's department of education that integrates technology into the new Comprehensive Curriculum. These plans incorporated activities from the state's new Comprehensive Curriculum and technology integration into two different subject areas. Plans were submitted to, and evaluated by members of the state educational technology staff.

Online Community of Practice

A Blackboard site (Blackboard, 2006) was used to build the online community of practice. This site, hosted by a local university, was a new tool for teachers participating

in the experience. Within the Blackboard site, two specialized group areas were set up for each school participating in the professional development experience. A separate group area, including a discussion board, file exchange and e-mail capabilities was set up for math and science teachers, as well as English and social studies teachers for each school. In addition, in the main area of Blackboard, all teachers had use of external links, including websites, master lesson plans, and journal articles about technology integration.

Teacher Participation. Teachers participated in weekly discussions related to the integration of technology. Prompts were given each week to facilitate teachers' discussion of the topics covered at the face-to-face session. Week one's activities allowed teachers to discuss NETS (National Educational Technology Standards) for teachers and students, and the most critical areas of the curriculum to enhance technology, as well as a discussion on the problems that teachers felt would arise when integrating technology. During week two, teachers discussed the areas of the new Comprehensive Curriculum identified as potential areas for use in a technology enhanced, integrated unit plan. Using these areas of the Comprehensive Curriculum, teachers discussed the guiding questions and technology enhancement of student higher-order thinking skills. During week three, teachers discussed Internet safety, and using directed browsing activities such as Trackstar and WebQuests. They were asked to share ideas for how to use these tools in the classroom, as well as discuss Internet safety and potential problems for students using the Internet to conduct research. The final week, the teachers collaborated online to create their technology-enhanced unit plan, as well as share their plan with teachers from other grades. Table 3.7 displays prompts for each week's discussion.

Table 3.7
Weekly Discussion Board Prompts

Week	Prompt
Week 1	What do you believe are the two most important technology standards for your students and your content area? Given an example of how you can meet these standards in your classroom.
Week 2	Please post the parts of the comprehensive curriculum identified for use with technology integration. How will using areas from science, math, and language, social studies work?
Week 3	Directed browsing activities such as Trackstar and WebQuests are designed to allow students to research using the Internet safely. What concerns do you have with students and Internet safety and how could these concerns be addressed? Scenario: 7 th grade students in groups of 3 are working on a WebQuest on the Civil War in the computer lab. Although they are told to only use the resources listed, you find 2 students checking scores on lsusports.net. What do you do?
Week 4	How does your student assessment in your unit plan address the guiding questions as identified by the comprehensive curriculum?

In addition to weekly discussion, the Blackboard site was used to provide resources for each week's topic of professional development. Resources ranged from example lesson plans from master teachers, to journal articles concerning technology integration. Participants used some resources during face-to-face sessions and were encouraged to use others during the online discussions.

Principal Participation. Principals were encouraged to participate in the threaded discussions and to send occasional personal e-mails to teachers, promoting the professional community of practice. Before the study began, principals were asked to define existing strategies that they used to motivate teachers in the past, and were encouraged to continue using these strategies. In addition, principals were also shown strategies designed to promote reflection and professional growth as defined by Blase and Blase (2000). To promote reflection, five strategies were suggested: make suggestions, give feedback, model best practice, use inquiry and soliciting opinions, and give praise

(Blase & Blase, 2000). In addition, to promote professional growth, five additional strategies were suggested: emphasize the study of teaching and learning, support collaboration efforts among teachers, develop coaching relationships among teachers, encourage the redesign of programs, and apply the principles of adult learning and development to staff development programs (Blase & Blase, 2000).

Instruments

School Climate Survey

Cavanaugh and Dellar (1997) identified a need for a new model of school improvement that would provide an emphasis on cultural constructs existing within a school, as well as the mission of that school. In the process of developing the School Improvement Model of School Culture, Cavanaugh and Dellar (1997, 1998) developed the School Cultural Elements Questionnaire (SCEQ). This questionnaire was developed to examine aspects of school culture including leadership, collegial relations, collaboration, commitment and professional relations (Cavanaugh & Dellar, 1997). The researchers tested the instrument multiple times in Western Australian schools, administering the questionnaire as well as using interviews to confirm the findings of the questionnaire with teachers. In this study, SCEQ was administered to identify existing differences in school culture in the two schools participating in the study. The results of the instrument were used compare the two schools used in the case study, which can be found with research results.

Teachers Using Technology

A Likert scale survey was adapted from six instruments (Box; Christensen, 1997; Knezek & Christensen, 1997; Schwarzer, Schmitz & Daytner, 1999; Schwarzer &

Jerusalem, 1993; Norris & Box, 2005). This new survey, entitled Teachers Using Technology (see Appendix 3) was designed to help determine the stage at which a teacher perceives himself or herself to be, to determine the level of confidence a teacher perceived him or herself to possess with respect to using technology in the classroom, and to measure the self-efficacy of a teacher in relation to using technology in his or her classroom. Given at the opening and closing of the professional development, cases were compared to determine growth in self-efficacy following the professional development experience.

To determine the validity of the instrument, the survey was given to seventy middle school teachers before the study began. A factor analysis was then conducted to reduce the number of variables measured to a few factors by combining variables that correlated to one another (Gall et al., 1996). Factor analysis was first used to identify commonalities in a pool of items developed to measure various aspects of perceptions of teachers in relation to the integration of technology. The data collected from the pilot study were subjected to exploratory factor analysis. Principal component analysis was used to extract the factors from the data set, resulting in the emergence of nine factors. The eigenvalues from this analysis showed that the first four factors accounted for 53.9% of the total variance.

Varimax orthogonal rotation was then used to maximize the loadings of each variable, or question in the survey on one factor (Garson, 2005). This rotation allowed the variables, or questions of the survey, to load with a single factor. From this rotation, four factors were identified: teachers' attitudes toward using computers as instructional tools, teachers' attitude about their need for technology professional development;

teachers' competence with using technology as an instructional tool; and teachers' confidence in integrating innovations. Five questions were determined to have confusing wording and were revised in the final survey.

Validity and Credibility Issues

Issues concerning content and construct validity were addressed as they refer to the self-efficacy instrument. Content validity refers to the assumption that questions on the instrument and scores from these questions are representative of all possible questions that could be asked about the content being assessed (Cresswell, 2002). Because the survey used was modified from six existing, published instruments, content validity is addressed. In addition to content validity, construct validity is addressed through the factor analysis performed on the survey. Through the results of the pilot study of the survey, the researcher felt confident that the instrument measured the construct it attempted to measure (Gall et al., 1996).

Trustworthiness is a term for assuring the quality of quantitative research (Lincoln & Guba, 1985). Trustworthiness can be broken into four criteria: credibility, transferability, dependability, and confirmability. All must be addressed to determine the trustworthiness of a qualitative investigation. This study used method triangulation to enhance the trustworthiness of the study by collecting data from multiple sources. Multiple data collection methods, including focus groups, interviews, teacher self-reports, content analysis and self-efficacy surveys were used to check the validity of the findings of the effectiveness of the professional development experience. This process helped to eliminate bias that might result from relying on any one data collection method (Gall et al., 1996). Thick description and inquiry audit were used in this study to ensure that

credibility, transferability, dependability and confirmability are addressed. Following the school climate survey, thick description was used to describe the context of the research to enhance the transferability of the findings. Field notes were also taken during the study as inquiry audit to enhance the dependability of the study.

Data Collection

Qualitative data were collected through a content analysis of the online community of practice, two teacher self-report questionnaires, six teacher focus groups, and two principal interviews. While participating in the online community, teachers and principals participated in five threaded discussions. These discussions were constantly analyzed throughout the professional development experience. Discussions between principal and teachers, as well as among teachers were reviewed to gain insight into the challenges and benefits of this professional development for both principals and teachers.

Teachers were also required to complete two self-reports, one in the middle of the experience and one at the conclusion. Questions were asked to gain further insight into the experiences of the teachers during the professional development session. Questions asked were:

- On average, how many hours per week do you spend involved in the online community?
- When and where did you most often participate in the online community?
- What technology competencies have you developed so far in this experience?
- In what ways, if any, did the online community facilitate your technology learning? Please give a brief illustration of each.

- What aspects of the online experience were not productive for you? Please give an example of each.
- Was your principal's participation a help or a hindrance? Please explain.

Teacher focus group interviews were also conducted following procedures recommended by Kreuger (1988). Each focus group consisted of one team of teachers. Each grade level had one team, consisting of teachers from all core subject areas. By using a focus group approach, all teachers participated and gave insight into the following questions:

- What did you perceive your role was in this professional development experience?
- What was the most important thing you learned from a colleague?
- In what ways do you believe you have developed more competencies with technology integration?
- How do you feel about your principal's involvement in this experience?
- What insight did you gain about your principal's values about technology and instruction from this experience?
- In what ways, if any, did the online community facilitate your technology learning? Please give a brief illustration of each.
- What aspects of the online experience were not productive for you? Please give an example of each.

Focus groups were opened with a script that welcomed participants, discussed ground rules for participating, and stated the purpose, or overview of the meeting. Following this

introduction, the above questions were asked to teachers, encouraging all teachers to participate, and probing for more information as needed.

Each principal was interviewed after the professional development was concluded. Using a standardized open-ended interview approach, principals were asked the following questions:

- What was the experience of participating in this professional development like for you?
- When and where did you most often participate in the online community?
- What instructional competencies did you notice your teachers discussing?
- What techniques (new and old) did you use to facilitate this experience for your teachers?
- What insights did you gain about your teachers' values about technology and instruction from this experience?
- What problems did you observe in the online interaction and what, if any, steps did you take to address them?

To provide more insight into the effectiveness of the professional development program, quantitative data were also collected. A school climate instrument was given to teachers at both schools before the professional development began. This instrument served the purpose of describing the school climates and of identifying already existing differences between the two schools. Furthermore, a survey was given before and after the professional development experience to measure teacher self-efficacy.

CHAPTER FOUR

RESEARCH RESULTS

The research questions are divided into two major areas: principal participation and teacher participation. Data analysis and results will be described below according to research questions and sub-questions.

Data Analysis

The following tables display the sources of data used in answering each research question.

Table 4.1
Principal Participation

Research Sub-Question	Source of Data Analysis
What contributions to the discussion do principals make (e.g. promoting teacher reflection, promoting professional growth)?	<ul style="list-style-type: none">• Content analysis of principal involvement in the online discussions• Principal Interview Question - What techniques (new and old) did you use to encourage your teachers in this experience?• Principal Interview Question- What problems did you observe in the online interaction and what, if any, steps did you take to address them?
What do principals learn about their teachers as a result of their participation and how does this influence their expectations?	<ul style="list-style-type: none">• Principal Interview Question- What instructional competencies did you notice your teachers discussing?• Principal Interview Question- What insights did you gain about your teachers' values about technology and instruction from this experience?
What were the challenges and benefits for the principals?	<ul style="list-style-type: none">• Principal Interview Question- What was the experience of participating in this professional development like for you?• Principal Interview Question- When and where did you most often participate in the online community?

Qualitative Data Analysis

The analyses of the content of the threaded discussions in the online community, as well as the analysis of interviews, focus groups, and self-reports were conducted

Table 4.2
Influence of Professional Development on Teachers

Research Sub-Question	Source of Data Analysis
How does participation in this experience influence teachers' competency with instructional technology?	<ul style="list-style-type: none"> • Teacher Focus Group- In what ways do you believe you have developed more competency with technology integration? • Self-Efficacy Survey • Self-Report- What technology competencies have you developed so far in this experience? • Self-Report, Teacher Focus Group- In what ways, if any, did the online community facilitate your technology learning? Please give a brief illustration of each.
How is the participation of the principal perceived by the teachers?	<ul style="list-style-type: none"> • Teacher Focus Group- How do you feel about your principal's involvement in this experience? • Teacher Focus Group- What insight did you gain about your principal's values about technology and instruction from this experience? • Teacher Focus Group- What insights did you gain about your principal's values about technology and instruction from this experience? • Self-Report- Was your principal's participation a help or hindrance? Please explain.
What were the challenges and benefits for teachers?	<ul style="list-style-type: none"> • Teacher Focus Group- What did you perceive your role to be in this experience? • Self-Report- On average, how many hours per week do you spend involved in the online community? • Self-Report- When and where do you most often participate in the online community? • Self-Report, Teacher Focus Group- What aspects of the online experience were not productive for you? Please give an example of each. • Teacher Focus Group- What was the most important thing you learned from a colleague?

through constant comparative analysis (Glaser & Strauss, 1976). Using this method, the threaded discussions, interview data, focus group data, and self-reports were segmented and coded according to significant themes and patterns. As outlined by Creswell (2002), the following steps were followed in the constant comparative analysis:

- Raw data were formed into indicators, small segments of information that come from different people, different sources, or the same people.
- These indicators were grouped into several codes, and then formed into more abstract categories.
- During this process, indicators, codes and categories were constantly compared to eliminate redundancy.

Through constant comparative analysis, threaded discussions, interview data, focus group data, and self-report data were examined to identify categories, to create sharp distinctions between categories and to decide which categories were theoretically significant (Gall et al., 1996). From this analysis, thick description of the themes and categories were developed to illustrate the findings of the study.

Quantitative Data Analysis

After the conclusion of the experience, the researcher coded and analyzed the quantitative data (Creswell, 2002). When coding the data, the researcher entered the data into the SPSS program. The data were cleaned to ensure that unusual data did not exist due to keystroke errors or delinquent mistakes by participants. The database was explored for these errors by running a descriptive analysis using SPSS and noting unusual data. Descriptive and inferential statistical procedures were used to analyze the school climate survey and the self-efficacy instrument completed by teachers.

Principal Participation

The first goal of this research was to develop an understanding of how principals participate in the online community of practice and what they learned as a result of their participation. Insights gained from content analysis of the online interaction between

principal and teachers, as well as principal interviews, were explored. After conducting principal interviews, the data were manually transcribed and analyzed using constant comparative analysis. Through constant comparative analysis of the interaction between principal and teachers in the online community of practice, as well as principal interview data, the first question was addressed: What contributions to the discussion did principals make?

Principal Contributions to the Online Community

Interviews with both principals provided insights into their approach as to participating in the online community. When asked what techniques were used to facilitate the online community, principals identified four categories: emphasizing commitment to ongoing learning, making suggestions, offering professional praise, and probing for clarification/more information. Both principals spoke of these four techniques. Principals discussed how seeking out and maintaining successful, ongoing training for their teachers is imperative. By providing teaming times where professional development opportunities could be given, both principals believed that this would allow teachers to continue to grow. Principals also spoke of participating by making suggestions. Both principals felt that by sharing either differing or agreeing opinions with their staff, they were not only sharing their own viewpoint, but allowing teachers to see their interest in the professional development experience. Principals also spoke of “praising their efforts.” Both principals spoke about praise, and how the technique of providing professional praise about a teacher’s work has been successful.

During the interviews, both principals spoke of the ‘on the spot’ decisions made during their participation in the online community. Principals did not have pre-

determined methods of encouragement or participation; furthermore, neither principal made a conscious decision about strategies to use during online communication:

You know, I didn't make a conscious decision about what I was going to do, so basically what I did was read what they wrote and respond to it. Sometimes it was sharing my ideas with them, sometimes it was praising their efforts, sometimes it was asking them for more information about what they had put. I didn't say, oh, this was going to be my role or my mission.

Although principals identified very few strategies that they used during the online interaction, many more became evident through the analysis of the online community discussions. As a basis for coding, some categories of principal participation, including making suggestions, giving feedback, using inquiry and soliciting opinions, and giving praise were determined a priori from behaviors deemed important in the literature (Blase & Blase, 2000). Other codes emerged through constant comparative analysis of the online interaction.

Categories of support that emerged included offering further assistance/facilitating solutions, making suggestions, and using inquiry to solicit opinions. Principals offered further assistance to teachers when teachers presented a concern about using technology in the classroom. Principals also made suggestions on the work teachers were doing in the online community. Finally, principals used inquiry to solicit opinions. Most often used to encourage more participation from teachers in the online community, principals often asked teachers questions to encourage deeper thinking of the topics being discussed.

In addition to the professional support provided by principals, emotional support was also given. Categories of emotional support techniques used in the online community by principals were: showing humor, well-wishing, encouraging personal

relationships, giving personal praise, encouraging competition. Both principals used personal praise showing teachers individually that they acknowledge their growth in the integration of technology. Ms. McGrew often used humor and competition to lighten discussions and reach teachers on a personal level. In contrast, Ms. Morel often posted well-wishing statements, showing teachers that she was present and hoping that the training was successful and useful to each of them. A summary of all categories of principal participation, definitions, and the identification of which principal used each strategy is displayed in Table 4.3.

Table 4.3
Categories of Principal Participation

	Category	Used by	Definition
Emotional Support			
	Showing humor	McGrew	Using funny or amusing comments
	Encouraging competition	McGrew	Encouraging teachers in opposing groups (math and science, English and social studies) to outdo each other
	Encouraging peer relationships	McGrew	Encouraging teachers to develop personal interactions among themselves.
	Well-wishing	Morel	Making general comments stating that the principal hopes teachers are enjoying and learning from the experience
	Giving personal praise	Both	Commending the individual teacher and his or her nature (not associated with professional efforts)
Professional Support			
	Making suggestions*	McGrew	Making comments to offer additional insight to professional problems
	Emphasizing commitment to ongoing learning*	Morel	Showing the importance life-long learning in the educational field
	Offering further assistance/ Facilitate solutions	Both	Making comments to answer questions or provide solutions for problems in the classroom
	Probing for clarification/ More information*	Both	Asking for more information about a topic

Table 4.3 Continued

	Offering professional praise*	Both	Commending teachers about their professional work
	Probing to solicit opinions	Both	Asking questions to allow teachers to offer further insight on a given topic

*Principal-Identified Strategies

The following within-case sections provide further insight into individual principal participation in the online community. The quantity of postings to the online environment is described, as well as various strategies used by each individual principal during the online communication with teachers.

Bayside Middle, Ms. McGrew

Ms. McGrew, principal of Bayside Middle, took an approach to communicating with her teachers online that was personal and individualized. Ms. McGrew used varied strategies for interacting with her teachers using humor, encouraging peer relationships, encouraging competition, probing to solicit opinions, praising both professional and personal efforts, offering further assistance/facilitating solutions, making suggestions and probing for more information.

Ms. McGrew fully participated in each discussion, posting twenty-three messages during the four-week experience. In weeks one, three and four, Ms. McGrew posted one or two comments to each group's (English and social studies, math and science teachers) discussion board. Each of these comments was lengthy and full of insights and suggestions, as will be discussed below. In week three, when discussing Internet safety, Ms. McGrew posted five comments to one board and six to the other, each adding insight to the discussion. In addition to the weekly postings, Ms. McGrew had three to six postings to each 'faculty lounge,' a forum created in the online community where

teachers introduced themselves and discussed informal issues such as weekend plans, personal relationships, and the weather.

In the opening day of professional development, teachers participated in the faculty lounge discussion, gaining proficiency posting a message to the online community. Ms. McGrew participated in this informal discussion, often using humor with her teachers. When one teacher posted a comment under a different name, Ms. McGrew asked, “Is this your alter ego?” Her lighthearted responses were well-received by teachers, and informal jesting became common in the faculty lounge discussion. Also in the faculty lounge, Ms. McGrew enjoyed non-curriculum discussions with her faculty. Following a long weekend in the middle of training, one teacher posted a new thread to the faculty lounge in the online community, sharing the good news of her engagement to be married. Ms. McGrew was excited to hear her news and responded: “Here’s my advice: go through with the big wedding for all the people who find it important....and get Susie (a colleague) to make you a scrapbook!” By taking interest in the personal lives of her teachers, Ms. McGrew offered support and encouraged relationships between and among her faculty.

Ms. McGrew frequently encouraged competition between teachers. Seeing that one group of teachers had participated more than another on the first discussion, Ms. McGrew exclaimed, “Well, I’m glad somebody posted! The English/social studies group has put the Math/Science group to shame!” Often, Ms. McGrew would be the first to post to a new discussion, setting the standards for her teachers. For example, Ms. McGrew used inquiry to solicit the opinions of her teachers at the opening of the first week’s discussion. The question posed to teachers asked, “What do you believe are the

two most important technology standards for your students and your content area?” Ms. McGrew set the tone of the discussion by posting the following before any teachers had responded, “Okay, this is much deeper than a technology question. It gets to the root of your philosophy as a teacher. However you answer, it will reveal much about why you do the things you do!” This posting showed teachers that Ms. McGrew was very interested in their opinions on the subject and set the stage for a very interesting discussion.

Although less often used than other means of supporting her teachers, Ms. McGrew also offered professional and personal praise to her faculty. “Is this a math teacher talking about writing? I’m impressed.” More commonly, Ms. McGrew offered further assistance and facilitated solutions for topics that teachers were discussing or offered suggestions to the topics being discussed. For example, teachers at one grade level were asking how teachers at another grade level obtained a classroom set of laptop computers. Ms. McGrew answered: “The eighth grade wrote an 8-G grant for the laptops. If you are interested in writing one, let me know.” Similarly, math teachers were discussing the benefits of Microsoft Excel in their classrooms and discussing the possibilities of other software to be used. Ms. McGrew responded, “If you are interested in Geometer’s Sketchpad, let me know, and I’ll pursue getting it.”

Ms. McGrew also used the strategy of probing for more information. When a posting was unclear, or she wanted more information, Ms. McGrew would use simple postings to ask for more information. For example, “How did the timelines go? Was it easy for the students to create?” Often, Ms. McGrew would become a role model for her teachers. Many of her postings offered new ideas in using technology for instruction.

For me, Internet safety is a non-issue for vigilant, diligent teachers....before you ever put kids on the computers, you need to state your expectations. This is what you are to do. These are things that you cannot do. If you don't want them on a music site, tell them that. And you need to do that every time you put them on computers. Don't assume they already know. You need to monitor constantly. Yes, they can minimize or back out of something quicker than you can look at their screens, but you can tell by the look on their cherubic little faces when they are up to something. Call their name out loud. Give them that teacher look. (If you don't have one, go home and practice in the mirror.) Ask them to tell you what their task is. Ask them if that is what they are doing.... Vigilance. Diligence. Words to live by to become a master teacher.

Creekhollow, Ms. Morel

Ms. Morel fully participated in the online community, posting a total of thirty-two times during the four-week experience. Although some of the same strategies were used by both principals, as revealed in Table 4.4, Ms. Morel took a brief, formal approach to online interaction. Ms. Morel used many of the same strategies to interact with her teachers as Ms. McGrew did, including giving professional and personal praise, probing for more information, and making suggestions. Unique to her approach were strategies such as well-wishing and emphasizing commitment to ongoing learning. Overall, Ms. Morel submitted a large number of postings to each discussion. Ranging from three to seven, Ms. Morel posted several times each week to each group's discussion board. Unlike Ms. McGrew's statements were characteristically brief.

Ms. Morel often left quick words of praise to many of her teachers. Professional praises included postings that stated, "Excellent! These are newsworthy lessons" or "I love the connection between the two subjects" or "Great lesson!" Ms. Morel also showed her interest in teachers gaining recognition for their work, stating "Wow! This is great. You should do an article for the newspaper!" Ms. Morel sometimes offered personal praise to her teachers stating, "I am so proud of what you are doing!"

Ms. Morel used strategies such as probing for more information and making suggestions. When a statement was unclear, Ms. Morel would ask for more information: “Are you making your assessments first, using the guided questions? Are your objectives derived from the guiding questions?” Ms. Morel would also offer further insight into teachers’ discussions by making suggestions or sharing her own thoughts:

I agree that you must stay on top of them or they will stray into areas they shouldn’t. The worst thing a teacher could do would be to make the assignment and sit behind the desk. Having an alternative assignment is the best insurance because they don’t want to lose computer to written assignments. I’m glad you are enjoying this!

Again offering her own opinions, Ms. Morel discussed technology standards with teachers:

I agree with you on the importance of these two indicators. Technology can also lead to many inappropriate uses. There is a whole new category of criminal activity with technology use. People, especially young minds, need to know that just because it is ‘written’ does not make it true. Technology provides an avenue to disprove or prove what is presented as fact.

Unique to Ms. Morel were strategies of well-wishing and emphasizing her commitment to ongoing learning. Very often, Ms. Morel would post well-wishing messages to her staff. These messages were very informal and generalized. Some examples are, “I hope this is interesting for you,” and “I hope you have found this information useful and will continue with it.” Ms. Morel also discussed her own need for technology professional development, therefore emphasizing her commitment to ongoing learning, “I want to learn Excel with you guys!”

Challenges and Benefits for Principals

During interviews, principals identified many challenges and benefits associated with their participation in this professional development experience. Most discussed were the benefits associated with principals learning about teachers. Specifically,

principals gained knowledge about their teachers' beliefs about using technology and gained insight about their teachers' reaction to technology professional development. Challenges identified included revealing a lack of proficiency with technology, facilitating the full participation of all faculty in the online environment, and discovering time constraints. Because of the similarity of responses, a cross-case analysis was conducted to ascertain benefits and challenges of the experience for principals. A summary of benefits and challenges can be found in Table 4.4.

Table 4.4
Principal's Perceptions of Benefits and Challenges of the Online Community

Benefits	Learning about teachers' beliefs about technology integration
	Learning about teachers' reactions to professional development focused on technology
	Learning about teachers' technology competencies with technology
	Learning about teachers' motivation to use technology
	Participating any time, any place
	Communicating between teachers and principal
Challenges	Revealing lack of principal proficiency with technology
	Facilitating full participation by all faculty
	Discovering time constraints

Learning About Teachers

A major benefit discussed by both Ms. McGrew and Ms. Morel was the knowledge gained about their teachers. Both principals discussed how participating in the online community helped them to gain more in-depth knowledge of their teachers' beliefs about using technology in the classroom. In the online community, teachers discussed how to safely allow their students to research using Internet resources. This quickly became a discussion about rules, regulations, and punishments for students who do not use the Internet properly. This discussion allowed principals to gain insight into their teachers' beliefs about students and Internet research. Ms. McGrew stated:

...that was probably my most interesting discussion. One of the teachers said 'zero tolerance' that if they're in the wrong place, I'm going to take it away from them. And I think my response was if you talk about playing music, if that child had a CD player, would you take the CD player away, or would you take the assignment away?

This discussion allowed Ms. McGrew to gain insight into the beliefs of teachers about off task Internet behavior. Similarly, Ms. Morel gained insight into her teachers' concerns about Internet safety: "...they were all very concerned with students not being where they needed to be (on the Internet) and the fact that they can create something to narrow that scope...they were very excited about that."

Additionally, Ms. McGrew discussed how her teachers offered opinions as to which technology standards were most important to their particular students. This interaction allowed her additional insight into her teachers' beliefs about using technology: "...you know the first thing that we talked about was the standards for technology, and I really did look at that and say that this is a question about philosophy." Teachers answered the question, stating their opinion as to which technology standard was most important: students using technology as research tools, productivity tools, or communication tools. The discussion in both schools led to principals' gaining insight as to a teacher's beliefs about technology integration. Both principals found that teachers believe that students using technology as research tools and productivity tools are most important for their future competency with technology.

Participating in the online community also allowed principals to gain insight into their teachers' reactions to technology and professional development. Ms. McGrew stated, "I think that one of the things that I learned is that I think my teachers will respond in a positive way if they get something that they feel is useful to them." Ms. McGrew also spoke of the need for ongoing professional development: "And so I guess that's the

most important thing that hit me is that even the ones that have been here all along that have had lots of experiences with technology, they still need some formal training experiences.” Both principals also spoke of their expectations about teacher knowledge of technology integration. Ms. Morel stated that “I know that they have always tried to implement technology, and I think like me, not knowing how to lessen the scope scared them.” Ms. McGrew added that “...they may know a lot about technology, but they don’t know the techniques of integrating it into their classrooms, so that is what we need to focus on.”

Furthermore, principals discussed the benefit of learning about their teachers’ growth in technology competence. At the opening of the interview, Ms. Morel discussed the fact that before this professional development, many of her teachers believed they were implementing technology, but actually were not even having the students use technology:

It (this experience) gave them a good understanding of how to implement the technology and not just them (teachers) using power point. In the past that is their version (of technology integration): well I do use technology, I put up a power point. Technology is about the kids using it in the classroom, and I think this (experience) brought teachers’ understandings to the next level.

Ms. McGrew also spoke of the problem of teachers’ not knowing how to use technology in an effective manner: “...lots of times they didn’t exactly know what to do when they (students) got on the computer.” Both teachers spoke of the professional development allowing teachers to learn new ways to use technology with their students. Ms. McGrew commented on what her teachers learned, “I am really pleased with what the teachers got...the fact that they know how to use it (technology) to enhance their lessons.”

In conjunction with the competence gained, both principals also spoke of how technology integration competence leads to excitement and enhances the motivation of teachers to use new tools with their students. Ms. McGrew stated:

During this time, the number of people who stopped me on the sidewalk and said ‘we did this’ and they were really excited about it. And let me tell you what else, is they used it immediately. You would teach something on Monday, and they would be using it on Tuesday in class, which is just unbelievable. It’s just remarkable!

Both principals also spoke of the unit plan created by teachers which allowed teachers to use their curriculum and build an inter-disciplinary unit that integrated technology.

Creating the plan from the curriculum that must be taught, while integrating new strategies learned using technology, allowed teachers to think of “how they can implement that in class” and also gave teachers a “taste of success, and the idea of how to do things a bit differently.”

Other Benefits

In addition to gaining insight about their teachers’ philosophies about technology and technology professional development, principals also discussed other benefits of the experience: communication with teachers from their office at any time, and teachers’ use of the online community to open lines of communications between teacher and principal and to allow the principal to see more of what is going on in a teacher’s classroom.

At the most basic level, one benefit discussed by both principals was the fact that they participated in the teachers’ professional development from their office, at any time during the school day. Ms. Morel stated that “...it was kind of sporadic when I would get on, but usually early in the morning or late in the afternoon. It was easier for me to participate in this because it was at my own time.”

On a much deeper level, the most discussed benefit of this experience was principal communication with teachers. Although each principal discussed the subject very differently, both principals commented on the online interaction between principal and teacher. Ms. McGrew focused on opening lines of communication and dialogue with teachers. “I think that talking to them is probably the biggest thing.” Ms. McGrew used the online community to speak with her teachers about integrating technology and about how their philosophy of teaching can enhance the integration of technology. During the online interactions, Ms. McGrew shared her own insight into discussions and praised the efforts of teachers trying new ways of integrating technology.

Ms. Morel spoke of the online communication in a different way, focusing on the fact that the online community allowed her to see what her teachers were doing and implementing in their classrooms:

I think it (the online community) got me closer to what they are actually doing in the classroom. Just by what they were posting and what I was reading made me feel more involved. We do the walk-through observations, but in 5 or 10 minute walk-throughs, you don't get what they were telling me online. So, I think it really involved me more.

Ms. Morel saw the online community as a way to understand more fully what the teachers were doing in the classroom, as well as understand more fully what teachers were learning in the professional development experience. Concerned about teachers integrating the new curriculum, Ms. Morel emphasized the importance of the online community allowing her further insight into her teachers' lessons:

Just the fact that I could see them telling me how they are using that curriculum and what you were teaching them to implement those activities just opened up, like I said, so much more than I could get than just through walk-throughs or an official observation. Observations are one sitting, and with this (the online community) I could really see how they were using it (technology and the curriculum) across the board.

Challenges and Concerns

Along with the many benefits of the experience, principals also discussed three challenges: revealing a lack of principal proficiency with technology, facilitating full participation by all faculty members, and discovering time constraints. Many challenges discussed by principals involve lack of knowledge, or technology competence, making the online community more difficult to use. Ms. McGrew, when discussing the benefit of communicating with her teachers when outside of the actual sessions, also discussed her frustration with using the online community only from school, “It would have been much easier for me to do it from home, and it’s my fault that I couldn’t. I just didn’t take the address home.” She further discussed that she forgot to take the web address home and was unable to access the online community from home. However, she stated that this was her own fault, and that in future online communities, this problem could be easily remedied. Ms. McGrew went on to comment on the delivery system for the online community: Blackboard. “..It is really linear, so that if I read one reply, one post...then I have to go back to the beginning. I can’t go from a reply to a new post... it needs to be more like a web.” Ms. McGrew was not proficient in some of the more advanced settings of the online community delivery system, which may have relieved many of her concerns related to the linear nature of the discussion.

In a more pressing concern, Ms. Morel discussed her frustration with some teachers not participating fully in the online community. “I got to the point that I would be disappointed if there were no new postings because I wanted to see more of what they were doing.” More than just simply seeing how her teachers were progressing in the professional development, Ms. Morel was concerned about her teachers not gaining

valuable insights into technology integration. “I think that those that really participated just really gained, and I think that those who were just on the edges really missed out.”

Also of great concern, Ms. McGrew discussed how her faculty is a very close group of teachers, and that there would have been more participation, and the online conversations would have been more meaningful, if teachers participating were those who did not see each other each day.

One of the things I think about is when you are face to face in a workshop the interaction online is perhaps not as important to them (teachers). If they were face to face for a time, but then went back to different schools, then blackboard would probably be more important to them.

Ms. McGrew went on to state that getting online was not as important to her teachers in this experience as it would have been if teachers from other schools were also involved in the online community. She stated that “It is easier to stick your head in the door next door and say how did that work and show me, than it is to get online.”

Lastly, both principals stated that, as in any job-embedded professional development experience, time was a great challenge. Although Ms. McGrew came to at least one full face-to-face session for each grade level, she stated that she wished that she could have attended more face-to-face sessions. “I feel personally that I did not participate a lot myself because of time constraints. I would have liked to have been in the rooms more with you with the teachers, and I wasn’t.” Ms. Morel attended only the beginning of one face-to-face session on the opening day of the professional development.

I didn’t get to attend any of the full sessions, and that was something I really wanted to do but didn’t get to. It’s been really wild, and I think had I done that that would have created even more interest. And, I think had I not seen so much interest, I would have tried harder to get in.

Influence of Professional Development on Teachers

The second research question associated with this study asked: In what ways does this professional development experience influence the teachers? To answer the question and connected sub-questions, four forms of data were analyzed: teacher self-reports, the teacher self-efficacy survey, teacher focus group interviews, and unit plans created by each team of teachers. Details of teacher participation in the online community are also identified below in Table 4.5.

Table 4.5
Composition of and Participation in the Online Community Groups

	Bayside	Creekhollow
Mean number of postings per teacher	7.6	6.3
Range of teacher postings	2-16	2-12
Mean number of postings by principal	11.5	15.5
Number of online community groups	2	2
Number of teachers in each group	13/10	9/6
Number of females	13/9	8/5
Number of males	0/1	1/1

Teacher self-reports were given at the middle and end of the experience. Teacher self-reports were analyzed according to research sub-questions. Teacher self-efficacy surveys were given at the opening and end of the experience. The self-efficacy survey was used to gain further insight into teacher competencies gained through this experience. Teacher focus group interviews were conducted with each team of participating teachers, a total of six groups, following the experience. Each focus group took approximately forty minutes to conduct. Focus groups were audio-taped and manually transcribed by the researcher. Transcripts were analyzed according to research sub-questions and included the examination of teacher competencies gained, collegial connections gained and enhanced, the perception of principal participation by teachers,

and overall benefits and challenges for teachers. For each of these themes, data were analyzed and codes were assigned. Finally, teacher unit plans created during the experience were analyzed by a representative from the state’s center for educational technology.

Teacher Competency with Instructional Technology

When asked which specific technology competencies were gained during this professional development experience on teacher self-reports, teachers at both Bayside Middle and Creekhollow identified several areas where proficiency was gained. These areas are identified and defined in Table 4.6. Major themes that characterized the responses of the teachers were examined and are discussed below:

Table 4.6
Teacher Competencies Gained

Using technology as a productivity tool	Teachers using technology to make a useful product; students using technology to display knowledge
Using technology as a research tool	Teachers using technology to gain information; students safely using the Internet to conduct research
Using technology as a communication tool	Teachers using the online community to collaborate and share ideas with other teachers and their principal
Additional technology competencies	Teachers growing in self-efficacy; teachers demonstrating the effective integration of technology as shown through the unit plan

Technology as a Productivity Tool

Bayside Middle. Teachers at Bayside Middle discussed how this experience allowed them to gain knowledge on how to use technology in their classrooms as a productivity tool. Specifically, teachers at Bayside discussed how students could use some of the programs learned during the experience to create products that demonstrate knowledge and understanding. During sessions, teachers were specifically instructed on how students could create various products using technology, such as timelines, charts

and graphs in Microsoft Excel. While working collaboratively on their final unit plan, many teachers shared other productivity tools such as creating Venn Diagrams using Microsoft Word, designing brochures and flyers using Microsoft Publisher, and developing Power Point presentations. One teacher discussed her use of Microsoft Excel to create timelines with her class. “I did the timelines twice. Once with Rosa Parks and once with American history. They (the students) really did well...I just walked them through it.” Another teacher used Excel with her class: “(We used) Excel in graphing survey results from class newspaper reports.”

Creekhollow. Teachers at Creekhollow received the same professional development. Although some teachers discussed how students could use the programs, many teachers discussed how they had gained more proficiency in using technology as a productivity tool themselves. One teacher noted:

I learned a bunch of little computer tricks. I learned how to do a lot of stuff that I did not know how to do before just in the process of training. Like, in Excel, some of the things that you showed us, you just press a button and it averages. Those quick tiny things.

Another teacher spoke of how learning to use technology in a more productive manner lowered her stress level. “Just little things that frustrated me...when you showed me how to do it in a second I said, ‘Wow.’ It took part of my frustration away.” Other teachers spoke of how they learned to use technology to produce better products with their students. One teacher, for example, stated:

I’ve always felt very comfortable with technology, but not teaching a class full of kids with it because then they get all click happy. And, I mean I can do a timeline on Excel and all kinds of crazy things on Excel, but teaching kids how to do it is a different thing. Now, I feel like I can teach them. I can even do it with my special education group.

Discussion. Although Bayside Middle and Creekhollow discussed how they learned to use technology more effectively as a productivity tool, each school had a different way of expressing their accomplishments. Bayside Middle focused on student products, and how the programs learned could allow teachers to teach students to create quality products using technology. Teachers at Creekhollow shared these ideas, but added that simple ‘tricks’ taught during the professional development experience allowed them to be more productive with using technology, and in turn, allowed them to be more productive with using technology with their students.

Technology as a Research Tool

Bayside Middle. The teachers at Bayside Middle were perhaps most excited about learning to use technology as a research tool. During one session, teachers were instructed on how to use Trackstar, a free directed browsing tool for teachers, as well as how to find and build a WebQuest, an interactive tool used for Internet research. Teachers at Bayside Middle were particularly excited about the ease of making directed browsing activities: “Well, I couldn’t imagine myself doing this stuff four weeks ago. Making the Trackstar, I actually used it!” One teacher was so excited about the possibilities, she had her students research the following day. “Like Trackstar, we learned it one day. I went home that night and made one and used it the next day! I had never seen or heard of it before.” Another teacher who was very nervous about students using the Internet stated: “I also have found ways to help the students without making it too difficult to keep track of what they are looking at using Trackstar and WebQuest. I can’t wait to do one with my class!”

Many teachers at Bayside who were already allowing their students to research on the Internet were excited about the possibility of making Internet research more productive, “Before learning about those (directed browsing activities) I would still go in the computer lab and just have them do the research, so I don’t know if learning them makes me do it more often, but now it is more productive.” One teacher at Bayside found that now, having new tools to use the Internet to research, she had no more excuses:

To me, it was just an excuse thing. They (students) can go to this site and that site, and it is just an excuse to not get online. The conversation (in the online community) about Internet safety showed that you can do Trackstar and get online and monitor them. It is not that hard to do.

Creekhollow. Many teachers at Creekhollow also discussed how allowing their students to use the Internet to research was much easier than they expected. One teacher at Creekhollow discussed her surprise at their ability to create directed browsing activities for students to use while researching on the Internet:

Like the WebQuest, you look at one and see all of the work that goes into it and then think, ‘I can’t do that.’ I’ve done that when looking at them. I’ve used them before and thought, oh, I could never make one of those, and we did! And it was not that difficult! Granted, you made it a bit easier because you gave us a template, but I’ll always have that template, and now I could stray if I needed to. The template just gave me the jump start to what I needed to do.

During the creation of their final project, the technology integrated, collaborative unit plan, the majority of teachers at both schools chose to create activities that included students using technology as a researching tool. Five of the six groups of teachers created their unit plans around areas in the curriculum where students must research a given topic. Of these five groups, four created interactive WebQuests where their students used the Internet to complete a task.

Discussion. Teachers at both Bayside and Creekhollow enjoyed discussing the safety of Internet research for students. Teachers at both schools were surprised with the ease at which safe Internet research could be designed for students, and many teachers took lessons learned in the professional development sessions directly back to their classrooms.

Technology as a Communication Tool

Bayside Middle. Teachers at Bayside Middle also concluded that their new tool of using technology to communicate and plan was very important. “That (the online community) would be a tool where...I was able to send her some lessons and such because she doesn’t team with me, but she does teach world studies.” Many teachers at Bayside who do not meet together as a team used the online community as a medium for sharing lessons and planning. Specifically, one teacher at Bayside used online journaling with her students. During the conversation about online safety, one teacher shared her experiences with online journals and a grant that she was participating in. Sharing her experiences impacted teachers at other grade levels. When discussing productive aspects of the online community, one teacher stated:

Sharing new ideas on Blackboard (the online community). Using Trackstar and WebQuest got me interested in other ways I can use technology. Ms. Smith got into the conversation and told me of a grant I could write to get about thirty computers. I don’t think I would have had that opportunity without Blackboard because I don’t get to really interact with the teachers at other grade levels that much, and it was nice to, you know, she offered to help me out and give me more information, so it really go things going for me.

Another teacher at Bayside spoke of how using technology to communicate allowed her to state her opinions in a more productive manner:

Sometimes I can be a shy person, and online you are able to express yourself more through writing. Like, sometimes you won't say something face-to-face, but you will feel comfortable saying it in the online environment.

Creekhollow. Creekhollow teachers also discussed the benefits of sharing ideas and experiences online, "Seeing what other people are doing really helped." One teacher in particular shared her experiences with using the tools she had just learned. She discussed in the online community how her students had made timelines and used Trackstar to research using the Internet. This shared experience had a profound effect on other teachers, who do not often communicate with this veteran teacher:

One of the things I learned is that using technology (with the students) is not as hard as I thought it was. And, that it is do-able in the classroom, because there are people doing it! Reading on the Blackboard some of the things that other people are doing, have done, that it is do-able. Now I have no excuses not to. It's time to make time to do it.

Unlike Bayside, Creekhollow teachers did not discuss sharing specific lesson plans through technology. Much like comments made by their principal, Creekhollow's teachers' comments reflected the importance of 'seeing' what was going on in other classrooms:

It (the online community) just let us see what was going on in other classrooms in other areas. Also to see what other grades are doing, because those are the kids you are getting next year, or just seeing other teachers' style of presenting things. Because the way they explain things on Blackboard does go into the way they are going to explain it in class...I just went in and clicked and read just to see what they are doing too because I usually don't get to see those other teachers because they plan and team at different times.

Teachers at Creekhollow also discussed how using technology as a communication tool and participating in the online community allowed further reflection on their teaching philosophies. One teacher discussed how the online community forced her to "go back

and look at my curriculum and see, am I really incorporating technology with my curriculum?”

Discussion. Teachers at Bayside and Creekhollow discussed their new competencies with using technology as a communication tool. In both schools, teachers who were experimenting with technology shared their ideas, experiences, successes and failures through the online community. In both schools, this communication had profound effects on other teachers, best seen in teachers who did not often communicate with the sharing teacher. In addition, teachers at Creekhollow discussed how using technology as a communication tool allowed teachers to ‘see’ what was going on with other teachers and other students. Insights they had gained allowed teachers to draw conclusions on how to use technology more effectively in their classrooms.

Additional Technology Competency

Self-efficacy. To measure teacher self-efficacy, a survey was given to all participants at the beginning and end of the experience. Questions from the self-efficacy survey were determined to fall into four categories: teachers’ attitudes toward using computers as instructional tools, teachers’ competence with using technology as an instructional tool, teachers’ attitude about their need for technology professional development, and teachers’ confidence in utilizing new innovations. Means for each school on pre and post tests are identified below in Table 4.7.

A MANOVA was conducted to compare the two schools participating in the professional development experience on the four factors described above. The independent variable was schools. Difference scores between the pre and post tests for each of four factors were compared. The factors, from the survey, included attitude

Table 4.7
Mean Scores on Self-Efficacy Instrument

Area	Mean Score Pretest Bayside	Mean Score Posttest Bayside	Mean Score Pretest Creekhollow	Mean Score Posttest Creekhollow
Attitude toward using computers as instructional tools	4.11	4.38	4.69	4.02
Competence with using technology as an instructional tool	4.74	4.83	3.95	4.59
Attitude about the need for technology professional development	3.91	3.87	4.06	3.86
Confidence in utilizing new innovations	4.27	4.43	4.5	4.12

Note: 1=Strongly Disagree to 5=Strongly Agree

toward using computers as instructional tools, competence with using technology as an instructional tool, attitude about the need for technology professional development, and confidence in utilizing new innovations. The four difference scores served as the dependent variables. The assumption of homoscedasticity was tested using Box's M and it was determined that the groups did not differ in their covariance matrices ($F_{(10,3660)} = 1.098, p=.359$). Furthermore, testing the assumption of equal group variance, Levene's test concluded that the groups tested had equal variance on each of the four factors ($p=.191, p=.490, p=.448, p=.180$). Thus, the necessary assumptions for using a MANOVA were present. Wilks' lambda, which tested the difference between the two schools for four dependent factors, was significant ($F_{(4,26)} = 3.3, p=.026$). This showed a significant difference between the two schools in growth of self-efficacy factors. Bayside teachers demonstrated a more positive growth than Creekhollow teachers. Univariate analyses for each factor revealed a significant difference between the two schools on factor four, teachers' confidence in utilizing new innovations ($F_{(1,29)} = 10.03; p=.004$).

Interestingly, the mean score on this factor increased at Bayside while it decreased at Creekhollow.

Evaluation of Unit Plans. Teacher collaborative, technology-enhanced unit plans were submitted and evaluated by an educational technology consultant with the state’s educational technology center. Names of plan and the primary technology used within the plan are identified below in Table 4.8.

Table 4.8
Technology Enhanced Unit Plans

School	Grade	Name of Plan	Primary Technology Used
Bayside	6	Ancient Civilizations	WebQuest
Bayside	6	Newton’s Laws	WebQuest
Bayside	7	Who’s your hero?	WebQuest
Bayside	7	Pandas	WebQuest
Bayside	8	Huey P. Long	Trackstar/Microsoft Word
Bayside	8	Graphing and Rotation	Microsoft Excel
Creekhollow	6	Roman Empires	WebQuest
Creekhollow	6	Numbers in the News	WebQuest
Creekhollow	7	Civil War and Propaganda	WebQuest/Publisher
Creekhollow	7	Heredity	WebQuest
Creekhollow	8	The Acadian Odyssey	WebQuest
Creekhollow	8	The Solar System	WebQuest

Using a detailed rubric (Appendix 4), a technology consultant from the state department of education determined that the teacher products were an effective way of beginning to integrate technology into the classroom. Rubrics, scored from zero to three, measured unit plans in six areas:

- curriculum and standards- the degree to which the lesson focused on a content area and connections to the state’s curriculum standards and benchmarks
- objectives- the degree to which the objectives reflect observable and measurable student learning outcomes

- learning activities- the degree to which the activities are aligned with learning objectives and reflect an engaging, creative and innovative experience
- integration of technology into lesson plan- the degree to which the lesson used a variety of technology by students to enhance the learning of the student
- alignment with technology standards- the degree to which the lesson emphasized technology standards and performance indicators as stated by the state's technology plan
- assessment strategies- the degree to which the lesson assessed students, the quality and connection of assessments with learning objectives

Scores for each unit plan are presented below in Table 4.9 and 4.10.

Table 4.9
Bayside Lesson Plan Scores

Name of Plan	Curr. Stand.	Obj.	Learn. Activity	Tech. Int.	Tech. Stand.	Assess.	Total Score
Ancient Civilizations	2	2	2	1	1	2	10
Newton's Laws	2	1	2	1	1	2	9
Who's Your Hero?	1	1	2	2	2	2	10
Pandas in Paradise	2	2	2	1	1	2	10
Huey P. Long	1	1	2	1	1	2	8
Graphing and Rotation	2	2	2	1	1	2	10
Mean Score							9.5

Table 4.10
Creekhollow Lesson Plan Scores

Name of Plan	Curr. Stand.	Obj.	Learn. Activity	Tech. Int.	Tech. Stand.	Assess.	Total Score
Roman Empires	2	1	2	2	2	2	11

Table 4.10 Continued

Numbers in the News	2	2	2	2	2	2	12
Civil War and Propaganda	1	1	2	2	2	2	10
Heredity Traits	2	2	2	2	2	2	12
The Acadian Odyssey	2	1	2	1	1	2	9
Planetary Comparison	2	2	2	1	2	2	11
Mean Score							10.84

Note: Each score has a range of 0-3; maximum total score 18

When comparing the total scores of unit plans developed in the two schools, an independent means t-test was conducted and revealed a significant difference between means ($T = -2.272_{(10)}$, $p = .046$). There was a significant difference between the quality of the unit plans in favor of Creekhollow. All teachers were believed to be aware of the possibilities for the use of technology to support professional practice. Teachers also showed the use of basic productivity tools and Internet resources with students.

Teachers' Perceptions of Principal Participation

During the focus group interviews, teachers at both schools described their reactions to their principal's participation in the professional development experience. Although a variety of reactions were expressed, a number of key aspects emerged. Reactions to principal participation are described below in Table 4.11.

Table 4.11
Teachers' Perceptions of Principal Participation

Category	Definition
Values	Principals' priorities and beliefs about the learning environment
Pressure	Strategies principals used to compel teacher participation
Role	Type of leadership approach assumed by principals
Professional Support	Strategies used by principals to enhance and extend teacher learning

Bayside Middle Teachers

Values. During focus groups, teachers at Bayside Middle spoke often of Ms. McGrew's comments in the online community, and how those comments led teachers to a deeper understanding of what their principal valued most concerning professional development and technology integration. Setting the tone, one teacher described Ms. McGrew's overall attitude about teachers using technology, "She is really into technology. She encourages us and expects us to use technology in our classrooms." Ms. McGrew also made this professional development a priority, giving teachers further insight to her values. "She set aside our planning time to do this for many weeks. That let us know that she is encouraging us in this direction constantly." Many teachers felt that Ms. McGrew's simply allowing teachers to participate in the program showed her value for technology integration, "I think allowing us, it showed a priority just allowing us to do this. With our school, it seems like she goes out of her way to show new and different things to us." This fact that Ms. McGrew allowed the teachers to participate was well received. "It's leading by example; it's setting priorities. If she doesn't hold the values, then I wouldn't see the value in this technology stuff." Others spoke of how Ms. McGrew's 'setting priorities' had a direct effect on their participation. "If she wouldn't have shown a priority, I wouldn't have been as involved."

By participating in this experience, Ms. McGrew also showed her staff her beliefs and expectations regarding teachers' use of technology following the experience. One group of teachers spoke of Ms. McGrew having a direct effect on not only allowing the professional development, but also setting expectations for technology integration after the professional development is concluded: "I think she does now expect us to use this.

There is no excuse not to use it now because we have everything that we need to use it. That is slick on her part!” Another group discussed how seeing Ms. McGrew participate gave insight into her philosophies. “Her overall philosophy is that you learn by doing, and she is right. By having you come and us take this class we were actually hands-on doing these things we were learning.”

Pressure. Teachers at all grade levels discussed how Ms. McGrew was ‘watching’ all comments in the online environment. Most often, this was discussed in a positive manner: “We know that she is interested in what is going on in our class. She is pushing us to continue our education, and pushing us to be better teachers, holding us to a level of expectations.” Other teachers spoke of Ms. McGrew’s presence in the online community as a more difficult aspect of the professional development:

Just knowing that our administration was looking at what we were doing and looking to see how we integrate technology and just knowing that our administration expects us to work at a certain level. All of us definitely want to meet her expectations...just the added pressure of our administration looking at this program and knowing what was going on.

Others spoke of this added pressure playing a positive role in their experience: “It made me sit up a little bit more straight and say okay, I have to really think about what I’m going to write. I can’t sound like I don’t know what I’m talking about even if I don’t.” One teacher added that Ms. McGrew’s persistence was necessary for the success of the professional development: “She would have had to be involved; otherwise, you think she doesn’t care.”

In a few instances, Ms. McGrew sent e-mails to teachers encouraging further participation in the online environment. One such e-mail stated: “Okay, the English/Language Arts and Social Studies people are putting the Science and Math

people to shame! Which standards do you think are the most important? Be sure to post your thoughts to Blackboard!” In the focus groups, teachers did not often speak of these e-mails. One comment was made that “Ms. McGrew had to e-mail us to remind us to do it (respond to the online community question).” When asked how this made the teacher feel, he responded, “It was like, I forgot about it, and I’d better get that done. It is important.”

Role. In both the online environment and the face-to-face sessions she did attend, Ms. McGrew became a role model for learning about technology. Ms. McGrew did not attend all face-to-face sessions; however, she did attend at least two sessions, some in their entirety and some only partially, for each grade level. This face-to-face interaction was valued by teachers at Bayside: “I think she came to a few sessions, which was, to me, a sign that it was important to her. Her coming to the things showed that she supported it.” Another teacher added:

Then you have McGrew who is saying, ‘I will take part in this with you. I will participate in Blackboard. I’m going to sit in on these lessons when I can,’ and if you have a technology question she can answer these questions for you. So, she is our role model, and she is participating in this with us, and not just saying, ‘Here you go, do it; I have other things I have to do.’

Other teachers discussed Ms. McGrew’s comments in the online community, and how these comments made teachers really think about the issues being discussed: “I would always read what she was saying, and it would push you to go on and get your response in because she would say, ‘I really want you to think about this.’” Another teacher spoke of how she not only valued Ms. McGrew’s presence in both the online and face-to-face environments, but she also saw value in Ms. McGrew’s receiving training as well:

Her being on Blackboard showed that she cared about this experience. She's trained in it too. A lot of principals send you to this training, and they don't know themselves. I think that the fact that she can get on Blackboard and respond and start a new thread...She is trained, which is a tremendous help to the rest of the faculty. To me, if the principal knows it and is trained on it, it won't be long until it is school wide. Like you said, I think technology will now be expected school wide

Professional Support. The interaction in this experience also led some teachers to feel more comfortable being critiqued by Ms. McGrew: "I don't mind ever getting advice from her because I feel that she does it in a tasteful way where I don't feel like I'm ever being talked down to." On the other hand, many believed that Ms. McGrew's technology competency and participation created an intimidating relationship concerning technology, "She can be a very intimidating person because she is so knowledgeable and intelligent about these ideas. I don't want her to look down upon me in any way because I have a crazy question."

Summary. Through this experience, teachers gained insights about their principal. Teachers at Bayside discussed the quality of postings made by Ms. McGrew during the online interaction, and how these postings provided deep insights into the topics being discussed. In addition, this experience allowed teachers to gain valuable insights into Ms. McGrew's beliefs about technology integration and expectations for the future of technology integration at Bayside. A few teachers felt that their principal was 'watching' their online conversations, and that this fact added additional pressure to the experience. However, most teachers saw this added pressure as a positive way to push teachers to fully participate and learn more. Teachers also valued seeing Ms. McGrew occasionally participate in face-to-face sessions and saw this participation as Ms. McGrew serving as a role model in learning about technology. Teachers also had a positive reaction to feedback given by Ms. McGrew in both the online and face-to-face

sessions. Ms. McGrew's participating in this experience had an overall positive effect on her teachers.

Creekhollow Teachers

Values. Teachers also discussed how this program allowed them further insight into Ms. Morel's values concerning professional development and technology integration. Teachers spoke of Ms. Morel's technology competency: "She wants us to use technology and become more competent in it. She is not, and she will readily admit that she is not competent in technology." Many Creekhollow teachers also discussed how by simply allowing the program at her school, Ms. Morel was showing that technology integration was a priority. However, most teachers believe that technology is not one of Ms. Morel's biggest priorities. Many teachers spoke of how Ms. Morel is very supportive of technology efforts, but that her bigger priorities lie on enforcing 'rules,' things such as school dress code and the new Comprehensive Curriculum.

I think every principal thinks it (technology integration) is important because it is a big push right now. She has been a big advocate of the grant, the 8G grant that we redid last year and was very helpful with that. But, that is publicity for our school, number one, and it's lots of money for our school...don't get me wrong, I do think she thinks technology is important, but I think dress code is more important because we hear it everyday, it is a rule. She is just a stickler for the rules.

Other teachers agree that publicity is more of a priority for Ms. Morel, but that if technology integration can gain publicity, it would be a priority. "Let's get down to it, if the teachers are competent (using technology), then the teachers can teach their students, and the school results in better scores and higher praise."

Pressure. Perhaps most talked about by Creekhollow teachers was pressure put upon them by Ms. Morel. Teachers were less consistent with how they viewed pressure put upon them by Ms. Morel during this experience. During focus groups, teachers spoke of

two e-mails. The first was sent by Ms. Morel before the professional development began and was entitled 'Bulletin: Earn 10 CLU's' and was very well-received by teachers:

I am so excited to participate in a graduate student's dissertation. In doing so, all content area teachers will earn CLU's (10) and learn lots of technology use in the classroom (with concentration on the Comprehensive Curriculum). Mrs. Cindy Vavasseur will meet with you all (required) on Thursday during your Teaming times. She will give you an in-depth overview of the program. It involves 8 meetings (during teaming) where you will work with Blackboard, Excel, Trackstar and WebQuest. I hope to sit in on the trainings myself! This is a wonderful opportunity for you to learn technology use in the classroom to benefit our students. All content area teachers are mandated to participate in this. Thank you for your usually cooperation and let's make Cindy feel very welcome!

Teachers spoke of Ms. Morel's enthusiasm after they received this e-mail: "Yea, you have been selected, and we are going to do this program. It's going to be wonderful, and it is going to be a great opportunity for you. She was right!" One teacher disagreed, and discussed how Ms. Morel was 'dictating' that teachers participate in the program. Most teachers, however, found this display of pressure to participate to be positive: "It was not like, on these dates you must be in the library and do this... It was presented as you have this wonderful opportunity, and I think you should get the most out of it as you can."

Ms. Morel sent another e-mail in the second week of the experience, encouraging and reminding teachers to participate in the online discussions, entitled 'middle school teachers':

It is very important that you participate in the Blackboard discussion in order for this program to be successful. I have replied to the one teacher that has answered the question, thank you, Susan, and would like to respond to others. It only takes a minute, please help us out.

This form of pressure for teachers to participate was received with hostility and resentment by some teachers, and indifference by others. "I don't care if she responds or not (to online community discussions), but then don't send out an ugly e-mail telling us

you'd better get on Blackboard if you can't ever respond to us individually.” Another teacher described this e-mail as “brow beating” and described how all teachers on her team had intentions of fully participating in the online discussions, but had not responded at the moment of the e-mail. Each group of teachers at Creekhollow commented on this very e-mail during focus group interviews. Most teachers commented negatively about the e-mail; however, one teacher voiced another opinion:

It doesn't bother me...to be honest with you, and I'm going to say it: she does not possess the characteristics of being tactful. On most cases, she means well that she wants to see us participate but does not know how to get that across...I thought it was just a reminder, and when I get to it, I'll get to it, and I think my comments are just as important as everyone else's comments.

Overall, pressure put on teachers at Creekhollow by Ms. Morel received mixed reactions. Many teachers felt like Ms. Morel was ‘watching’ them in the online environment: “Her being on Blackboard made me feel like she was watching me. That is why I didn't like to participate because I felt like if I put a comment there, it might come back at me later.” Other teachers, however, were indifferent to the pressure, stating that their principal was simply trying to encourage their participation in the experience.

Role. Many teachers spoke of Ms. Morel's participation in the online environment and how she served as a role model in the experience of learning about technology: “At least she participated, she tried!” Most teachers were very glad to see principal participation in the online community: “I read Blackboard and was glad to see that she was participating and taking interest in it.” Teachers at Creekhollow expressed that their principal is not proficient in technology, but strives to be. This allowed Ms. Morel to serve as a role model for learning about technology because she was learning new techniques just as her teachers were in this experience. Teachers often spoke of Ms.

Morel's desire to become competent with technology: "She doesn't just see that we get training, she does it herself. She went to the principal version of INTECH, yea, LEAD-TECH."

Knowing that their principal wanted to learn about technology, many teachers were disappointed to see that Ms. Morel did not attend any of the face-to-face sessions. Although fully present in the online community, many teachers voiced the opinion that Ms. Morel could have been more visible during face-to-face sessions:

I guess I'm more of, don't just respond to what I write on Blackboard, I want to see you face-to-face too because you are right down the hallway from me. Why couldn't you just walk down here and watch us while we're working and give us input on things and help us? Don't just sit at your computer and respond to my Blackboard...the comments on Blackboard and insight into what we were doing there was good. I guess I'm just more of a face-to-face person.

Others understood why Ms. Morel could not be at all sessions, but still craved Ms. Morel's interaction in serving as a role model during face-to-face sessions: "In the beginning she talked about how she was going to come to the meetings, but I know she can't come to every meeting every time." Overall, Ms. Morel served as a role model in the online community by showing her teachers that she was learning new technology skills with them. However, many teachers expressed the need for their Ms. Morel to be a role model in the face-to-face sessions as well.

Professional Support. Ms. Morel had a unique relationship with her faculty. Feedback given to teachers during this experience was met with mixed reviews by teachers. Some teachers who have worked under Ms. Morel saw feedback given as supportive, and described Ms. Morel as "meaning well...but (she) does not know how to get things across in a tactful manner to where most people don't feel like she is criticizing." Many other teachers, however, spoke negatively of some of the interaction

they had with Ms. Morel during this professional development experience. “I felt that she was pushing me and my colleagues. It made me feel like I was being watched. I didn’t like that one bit.” Other teachers felt that comments and feedback given to teachers by Ms. Morel were not helpful, “It was like she was fussing at us.”

Summary. Teachers at Creekhollow did not like vague responses that were made to discussion boards in the online community by Ms. Morel during this experience. Many teachers also discussed how allowing the professional development showed a priority for technology, and how Ms. Morel’s participation in the online environment showed that she took interest in what the teachers were learning. However, teachers also commented on how Ms. Morel does value technology integration, but her priorities lie, and will remain, on rules, school performance scores, and positive publicity for her school. Pressure put on teachers by Ms. Morel during this experience was met with mixed reviews. Many teachers spoke of how Ms. Morel set the tone of the program with an encouraging e-mail. However, most teachers were vocal about pressure caused by an e-mail sent encouraging further participation in the online community, and how the tone of this e-mail was not encouraging. Ms. Morel served as a role model in the online environment by learning about technology with her faculty; however, many teachers expressed the need of this type of role model during face-to-face sessions as well. Mixed reviews were also received when discussing teachers’ reactions to feedback given by Ms. Morel in the online community.

Other Benefits and Challenges

During focus groups, teachers identified many benefits and challenges associated with participating in this professional development experience. Because of the similarity

of responses, a cross-cases analysis was conducted to attain benefits and challenges of the experience for teachers. A summary of benefits and challenges can be found in Table 4.12. The following describes in detail benefits and challenges identified by both principals in interviews concerning the professional development experience.

Table 4.12
Benefits and Challenges of the Experience for Teachers

Benefits	Principal support
	Confidence gained about integrating technology
	Technology competencies gained
	Materials gained
	Collaboration with other teachers
	Motivation to use technology
Challenges	Technology hardware availability
	The new curriculum
	Time constraints
	Concerns with the online community delivery system

Benefits

Many benefits described by teachers participating in the focus group interviews have already been explored, including principal support, confidence gained about integrating technology, and technology competencies gained. One teacher gave this summary:

Before this point, I think most of us were doing Power Point presentations, using word processing, but that is the extent of it. Maybe we were going online and doing research. But I don't think we knew that there were tools out there like Trackstar and WebQuests that could use, integrate technology fully into the learning process, not just use technology as a means to present something. You are actually using the technology, searching; it is a real, true way of integrating.

In addition to these benefits, teachers, during focus group interviews, described three other themes of positive outcomes from this experience: materials, collaboration, and motivation.

At the most basic level, teachers were thankful for materials obtained through this experience. On the opening day of the experience, teachers were provided with a book of materials (see Appendix 1) to use both during face-to-face sessions and once the experience was completed. During interviews, many teachers referred to these materials: “I think the guide you gave us will help a lot with this (integration).” Others were excited about using the materials. “I’m so glad I have my handy dandy green folder!”

More prominent in the focus group conversations were comments about the collaboration used through this experience. The professional development allowed teachers to create a cross-curricular unit plan where teachers worked together. “We definitely found new ways for cross-curricular. I think at first we had no clue, and I think it came out pretty nice in our lesson as well. And I think other subjects feel the same.” Going beyond the final product, one teacher spoke of how this experience caused her to gain insight into students’ points of views when working collaboratively: “I think that collaborating with one another was a help too because it made me see how some students can learn with collaboration rather than just trying to do it all themselves.” Another teacher commented that she would have never worked with the Social Studies teacher she collaborated with, “We never get together to plan anything together,” and that she was excited for the opportunity.

Other teachers spoke of collaboration in the online community: “We don’t get a chance to meet during the day (with teachers outside of the team), so Blackboard was a neat way to share our views.” Others spoke of teachers’ expertise being shared in the online community: “She was very knowledgeable with technology stuff. She is not afraid to do it...Hearing what she has done helps me, hearing that it can be done.” Others used

the online community to gain new ideas: “I got talking to different people, (I got) ideas about blogging and other ideas. I did it from home and usually don’t have the time (to talk to other teachers) from here.” In addition, teachers gained knowledge about grants that other teachers had written from the online communication: “Ms. Smith told me of a grant I could write to get about thirty computers. I don’t think I would have had that opportunity without Blackboard because I don’t get to really interact with teachers in other grades.” Other teachers were comforted knowing that they could share concerns using the online community: “I like the idea of everyone seeing our concerns and where we are and even if they don’t want to chime in, at least it can give them comfort.” One teacher specifically discussed the online conversation about Internet safety and the fact that she “liked to hear what other teachers are saying” in regards to safety and punishment.

Teachers also spoke of the motivational aspects of technology integration gained from this experience. First, teachers spoke of the motivational aspects for the students:

They (students) are pumped. We had lost them in the last three weeks, and this has helped...To gain them back this way is very positive because they have just been, I don’t know, the motivational aspects of technology was the best part of this experience for me.

Others spoke of the motivational aspects gained for themselves: “I was already using technology some, but this definitely brought me up a level.” “It was not as hard as I thought it would be.” Another teacher commented on how this experience made him more aware of technology integration in his classroom: “One thing I got out of it is that as we went through training, we made more of a point to say, okay, technology, how can I use it?” Finally, commenting on the online experience used in conjunction with the face-to-face professional development, a teacher in the final focus group commented:

I enjoyed the teaching, the learning new things. I also felt like my input was very important to what was going on too, so it was not like I was only being taught, but I was able to share my thoughts and that was applied with the process too.

Overall, teachers enjoyed the collaboration, both face-to-face with other teachers in the creation of a unit plan, as well as the motivational aspects of technology integration for themselves and their students. These benefits, in conjunction with principal involvement, confidence using technology, and competency using technology, were themes described by teachers during focus group interviews.

Challenges

In addition to challenges described concerning principal participation, teachers at both Bayside and Creekhollow described additional challenges associated with this experience including the availability of technology hardware, the new Comprehensive Curriculum, time, and concerns with the online community delivery system and its composition. Teachers first spoke of the problem of hardware availability following this experience. Each grade level of teachers has one computer lab available to them. Following the experience, teachers had difficulty gaining access to the labs: “I tried to schedule, and it took me three weeks to get to the lab...because more people are now excited about using technology. It is a good thing, but it would be better if we had more computer access.”

Many teachers felt that two innovations were being implemented this year: technology integration and the new Comprehensive Curriculum. In its first year of adoption, the new statewide curriculum is being mandated to all teachers. Overwhelmed by attempting to utilize two new innovations, many teachers felt that had the professional development been delivered next year when teachers were more comfortable with the

new curriculum, sessions would have been more successful. “If we had this experience again next year, it would be different. I mean, we could have said I could put this with this unit. I think part of our problem is we are just trying to stay above water.” Teachers also described the difficulty of integrating subjects with technology because of the new curriculum: “The problem lies with our constraints with the new curriculum, and we have to teach a certain thing at a certain time. This makes technology very difficult. If you had some flexibility there, we could really use it more beneficially.” Overall, teachers found it difficult to use two new tools in one year. Most teachers wanted to concentrate on the new Comprehensive Curriculum this year and discover new ways to use technology innovations next year.

Perhaps the biggest challenge for teachers was time. One teacher expressed the concern that the online community was too time-consuming:

I really didn't like doing Blackboard. It was a priority thing and time. I did the minimum for Blackboard and spent half an hour doing it for the week and didn't have time to come back. I was able to glance at a few comments, but it was never something that I thought I got a super amount from...I don't think that it was not meaningful, it is just everything else that teachers are responsible for.

Many teachers, also concerned about time restraints and other responsibilities, expressed interest in doing this program when they were not under stress. “I would have like to have done this at a time where I was not being rushed.” Many suggested that this program would have had greater success as a summer institute, or available not during school hours: “We needed this where we could just concentrate on this...if you had a summer thing, I would really take it. I'd rather this outside of school, looking at this during the summer.” However, many teachers saw time constraints as a positive aspect of the program:

...but at the same time it almost takes someone forcing us to do something like this; otherwise, we are all so busy, grading and coming up with this and that and re-inventing the wheel, over and over again that we would have never taken the time to learn how to do a WebQuest or anything else on our own initiative.

Many veteran teachers acknowledged the time constraints, but saw the value in the program despite them. “Overall, I think it was a good experience; yea, it was time consuming...but we will all benefit from it in some way.” Other teachers suggested keeping the program at teaming time, but stretching the program to eight weeks, with only one session per week: “...even if we had to come more weeks, that would have been better for us. Two days per week puts us behind with our planning and teaming.” Still other teachers, feeling that they learned too many new skills in a short amount of time, spoke of ‘technology overload.’

The last concern expressed by teachers involved the online community. Some teachers, when told they were going to learn about online communities, were disappointed that they did not get to use the community with their students: “...when I was told we were going to do Blackboard what I envisioned was how to set up our own classroom Blackboard.” Others did not like the structure of posting each week to a set question. Although most teachers enjoyed the online conversation about Internet safety, most did not value other conversations, including those on technology standards. “If questions were geared more toward our new curriculum and how you are teaching this and what activity you are doing and how did you extend this (the discussions may be more helpful)...I need help instead of questions.”

Teachers in this school district meet twice per year to plan and share units. Many teachers expressed the desire to modify the online community to not only share ideas among teachers in their school, but among all teachers in their district. “Basically, it was

productive across school, but it would be more productive with more schools involved.”

Another teacher added: “If it were across schools, then we could get other ideas, or even throughout the district, you know, not just one or two schools.” Teachers in small schools such as these often do not have other teachers to share ideas with. “I don’t have any other history teachers here that teach world studies that I can work with, get ideas from, or ask, well, how are you doing this?” Teachers at both Bayside and Creekhollow described the need for an online community of teachers, but described the need for a larger community with less structure, and the ability to share ideas, concerns, and support with other teachers teaching similar grades and subject matters.

CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

The purpose of this study was to provide insights about an innovative approach to professional development designed to facilitate the instructional implementation of technology. This study joined existing literature on problems and solutions associated with professional development designed to facilitate technology integration. Existing literature on online professional development, communities of practice, and principal support of professional development were key in designing and informing this research. Within this study, qualitative data in the form of interviews, focus groups, and teacher self-reports, as well as the collection of quantitative data in the form of responses to a school climate survey and self-efficacy instrument, allowed for the triangulation of data collected. Results from the analysis of these data has drawn the following conclusions and suggestions for further research on technology professional development for middle school teachers.

Conclusions

Based on the findings of this study, conclusions are discussed and organized by research questions. Conclusions were reached based on all data sources, including individual principal interviews, focus group interviews, self-efficacy surveys, teacher unit plan evaluations, and teacher self-report data.

Principal Participation

Contributions by Principals to the Online Discussion

Neither Ms. McGrew at Bayside nor Ms. Morel at Creekhollow joined the online community with clear, intentional strategies for how to support and interact with their

teachers. Techniques used by principals that were discovered in this study added to those produced from a study by Blase & Blase (2000) where characteristics of principals that enhanced teachers' instruction were identified. Blase & Blase (2000) identified techniques such as: making suggestions, giving feedback, modeling best practices, using inquiry to solicit opinions, giving praise, emphasizing the study of teaching and learning, supporting collaboration, developing coaching relationships among teachers, encouraging the redesign of programs, applying the principals of adult learning and development, and implementing action research (Blase & Blase, 2000). Findings from this study revealed that the same effective strategies were used in various forms.

Overall, both principals interacted with their teachers in the online community; however, techniques unique to each principal revealed an important distinction about the type of leadership displayed within each school. Characteristics of both transactional and transformational leadership were seen during this experience. Transactional leadership is based on an exchange of services (by teachers) in return for a reward (salary, leave time, or resources) that is controlled by the leader (Liontos, 1992). Often concerned more with products than people, transactional leaders are described as leaders who motivate followers by appealing to followers' self-interest (Burns, 1978). In contrast, built upon the assumption that the association with a higher moral position is motivating, and that collaborative work is more effective than individual work, Burns (1978) defines transformational leadership as a process by which "leaders and followers raise one another to higher levels of morality and motivation" (Burns, 1978, p.20). The goals of a transformational leader in an educational setting include helping staff develop and maintain a collaborative, professional school culture, fostering teacher development, and

helping teachers solve problems more effectively (Liontos, 1992). Transformational leaders are often concerned equally for both people and product.

Ms. McGrew was perceived as a role model and colleague in this experience. Techniques unique to Ms. McGrew were showing humor, encouraging competition, encouraging peer relationships, and making suggestions. Ms. McGrew's facilitation of this experience concentrated on best practice of technology integration, the importance of ongoing learning, and the benefits of teacher collaboration. This focus allowed teachers to renew their commitment to ongoing learning. These ways of interacting with teachers show that Ms. McGrew displays characteristics of a transformational leader (Bogler, 2000; Eden, 1997; Leithwood, 1992; Leithwood & Jantzi, 2000; Seyfarth, 1999). Ms. McGrew strove to attain three goals: helping her staff members develop and maintain a collaborative school culture, fostering teacher development, and helping teachers solve problems together more effectively. Studies have shown that this type of leadership leads to teachers' developing a higher level of commitment to the school and their career, higher job satisfaction for teachers, and improved school culture (Bogler, 2001; Leithwood & Jantzi, 2000). By displaying characteristics of transformational leadership, Ms. McGrew gave her teachers at Bayside the encouragement needed to internalize the importance of the experience, and the importance of peer collaboration within the experience.

Ms. Morel's leadership in this experience can be characterized as a more transactional approach (Day, Harris & Hadfield, 2001; Eden, 1997). Techniques unique to Ms. Morel's interaction with her teachers include well-wishing and emphasizing the commitment to ongoing learning. Most revealing, however, are those techniques which

were absent from Ms. Morel's communication with her teachers. When showing emotional support, Ms. Morel limited her comments to giving personal praise and well-wishing. Ms. Morel's support was most often professional in nature, emphasizing the importance of "newsworthy lessons" and emphasizing the importance of teachers successfully completing the experience. Ms. Morel's leadership was based on the exchange of teachers participating in the experience to gain a reward. Ms. Morel emphasized the importance of teachers gaining the CLU's (Continuing Learning Units) that were given at the conclusion of the experience. With this transactional leadership, Ms. Morel shows great ability to maintain the organization of her school, with emphasis on the day-to-day operations that must be carried out within her school (Day, Harris & Hadfield, 2001; Eden, 1997; Leithwood, 1992). However, by displaying this type of leadership, teachers at Creekhollow failed to receive the internal rewards that teachers at Bayside received.

At Bayside, the emphasis was on valuing the content of the experience and the relationships that could come from the experience. At Creekhollow, the emphasis was on the completion professional development and the unit plan that came from the professional development. This distinction caused teachers at Bayside and Creekhollow to have contrasting experiences during this program. Teachers at Bayside perceived the experience in a more positive manner, gaining confidence in utilizing new innovations, while confidence in utilizing new innovation decreased for teachers at Creekhollow. However, the culminating activity produced by teachers was of higher quality at Creekhollow. Therefore, at Bayside, where transformational leadership characteristics were evident, teachers gained confidence in utilizing new innovations; however, at

Creekhollow, where transactional leadership characteristics were seen, teachers had greater quality to the culminating activity of this experience. These findings support those of Eden (1997) where it was found that the most effective leaders display characteristics of transactional leadership and transformational leadership. “In innovative schools transformational leadership is relatively successful when it manages to incorporate transactional leadership practices in a way that is sensitive to the teachers” (Eden, 1997, p.260).

Blake & Mouton (1989) discuss two dimensions of leadership: concern for people and concern for production. An important distinction can be seen between the two principals in this study on their Managerial Grid (Blake & Mouton, 1989). Ms. McGrew at Bayside had a high concern for both her employees and the major functions of her school. This dual concern shows the effectiveness of Ms. McGrew’s leadership. Ms. Morel at Creekhollow, in contrast, showed a much higher concern for the major functions of the school than the concern for her teachers. As a result, Ms. Morel’s teachers produced better culminating activities for the professional development than Ms. McGrew’s teachers.

Challenges and Benefits for Principals

Overall, principals were vocal about the many benefits of this experience for both themselves and their teachers. Principals stated that they gained insights about their teachers’ attitudes about integrating technology, as well as their reactions to professional development related to the integration of technology into the curriculum. Moreover, principals underscored the competencies that their teachers gained. That is, teachers gained knowledge on how to allow students to use technology in the classroom. Most

prominent, however, was the benefit of communication between teacher and principal. Ms. McGrew at Bayside voiced praise for the online community opening lines of communication between herself and her faculty and allowing a mentor relationship to develop between principal and faculty. Ms. Morel at Creekhollow, in contrast, noted how the online community allowed her to gain further insight into how her teachers learned and integrated the curriculum and technology, using the online community as a monitoring device.

These findings support studies that highlight the busy schedules and daily challenges of a K-12 principal (Chan & Pool, 2002; Furman & Zibrida, 1990). The online community of practice served as an effective way for principals to support teachers in their efforts to grow professionally without limiting principals through time or place. By participating in the online community, principals were able to support teachers, gain insight into teaching practices, and gain insight into the work being done in the professional development program. In addition, the results support research findings of Morrissey (2000). Both principals maintained a “visible and knowledgeable presence” in their schools (Morrissey, 2000, p.36). Principals did this, in contrast, not through face-to-face visibility, but by being visible within the online community. Morrissey’s study concluded that a principal can encourage collaboration of teachers and play a critical role in developing professional learning communities (2000). This study extends the findings of Morrissey to acknowledge the fact that the principal did encourage collaboration in both schools and played a critical role in developing the communities, but did this partially through the presence and participation in an online community of practice.

Along with the benefits, principals also discussed the challenges associated with this experience. Challenges and concerns voiced by principals included the frustration with some teachers not fully participating, the value of a limited number of teachers in an online community, and the lack of time to attend face-to-face sessions. Principals also voiced many concerns already identified in research concerning online communities of practice, such as a lack of technical knowledge needed to sustain successful online communities of practice (Trentin, 2001). These findings highlight those previously stated, such as the fact that if facilitators or technical experts are not present, communities of practice are much more difficult to sustain (Trentin, 2001).

Influence of Professional Development on Teachers

Competence with Instructional Technology

Teachers at both Bayside and Creekhollow spoke of competencies they gained surrounding the use of technology as a productivity, research, and communication tool. Although some teachers allowed students to use technology to research before this experience, following the experience, teachers expressed how the new skills they learned allowed students to use technology to research in a more productive manner. The online community also provided teachers a new medium through which to communicate and collaborate with peers.

The culminating activity, the development of a technology-enhanced, collaborative unit plan revealed a significant difference in the quality of the plans created by teachers at Bayside as compared to those at Creekhollow. Scores for unit plans at Creekhollow were significantly higher than those at Bayside. This fact could be due to the type of leadership shown during this professional development experience. At

Creekhollow, Ms. Morel displayed signs of transactional leadership, emphasizing the importance completing the task given. Furthermore, she showed higher concern for production than for people (Blake & Mouton, 1989). This emphasis may have led to the unit plans at Creekhollow to be more successful than those at Bayside. As suggested by Leithwood (1992), a transactional leadership is central to the successful completion of tasks. The results of the analysis of teacher unit plans in this study suggest that the principal who displayed transactional leadership had teachers in the professional development experience who created more successful products than those teachers at the school with transformational leadership.

This professional development experience was designed with knowledge of the difficulties surrounding professional development for middle school teachers, such as the fact that many middle school teachers must receive much of their specialized professional development while teaching, and the fact that many professional development experiences are not designed with input from both teachers and principals (Flowers, Mertens & Mulhall, 2002). Results of this study agree with those of Pate & Thompson (2003). These authors discuss the fact that the development of the knowledge of middle grade teachers most often occurs within a community of learners. Teachers who expressed the competency gained in using technology as a communication tool also expressed the benefit of communicating with their peers in this manner. Furthermore, the findings of Flowers & Mertens (2003) discuss how a “one size fits all” approach to professional development is not effective for middle school teachers. This research adds to these findings. In these two middle schools, through the use of a needs assessment by both principals and teachers, the specialized professional development was well-received

by the majority of teachers because of the input gained by both teachers and principals prior to the design of the professional development (Flower, Mertens, & Mulhall, 2002). Two teachers, one at each school, were more proficient in using instructional technology than others. However, at the conclusion of the sessions, each of these teachers commented on the fact that they had used some of the techniques taught in the professional development before, but the sessions raised their awareness of how to use these tools more effectively with students.

Self-Efficacy

Results from the self-efficacy instrument indicated that there was a significant difference in self-efficacy change between teachers at Bayside and Creekhollow. Specifically, in one area, teacher confidence in utilizing new innovations, teachers at Bayside showed an increase in self-efficacy, while teachers at Creekhollow showed a decrease in self-efficacy. Supporting the work of Leithwood (1992), these findings suggest that in the school where characteristics of transformational leadership were found, teachers' confidence in utilizing new innovations grew. Conversely, at the school where transactional leadership was found, teachers displayed a decrease in self-efficacy when it related to confidence in utilizing new innovations. Furthermore, it was at Bayside, where Ms. McGrew expressed a concern for people as well as production, where the growth in self-efficacy was seen (Blake & Mouton, 1989). These findings support the thoughts that transactional leadership has many benefits, but alone, it does not stimulate improvement within schools (Leithwood, 1992). In addition to the findings on the self-efficacy instrument, teachers at both schools, in focus group interviews, discussed self-efficacy, stating that by participating in this experience and learning to use

computers for different purposes in this experience, they gained greater confidence with using computers to enhance instruction.

The Rand studies suggest that improved teacher self-efficacy could relate to reduced stress among teachers, as well as improved relations among teachers and administrators (Tschannen-Moran et al, 1998). The current research agrees and suggests that the Bayside teachers, who had a more positive perception of principal involvement in this professional development, also had a growth in self-efficacy following the program. It has also been suggested that two specific ways to influence a teacher's self efficacy are through collective efficacy effects and leadership (Tschannen-Moran, et al, 1998). This study suggests that the principal who showed transformational leadership characteristics had a positive effect on teacher self-efficacy, while the principal who displayed characteristics of transactional leadership did not. Techniques displayed by Ms. McGrew, such as humor and encouraging peer relationships led to the growth in teacher self-efficacy. These findings agree with those that of Farrell (2001) that suggest that successful professional development emphasizes the importance of principals grouping teachers by teams, focuses on content instead of software, emphasizes being flexible and listening to the needs of teachers, and models classroom examples (Farrell, 2001). Furthermore, it has been suggested that "top-down" professional development for technology does not work (Farrell, 2001). Ms. Morel's focus on people and production allowed the techniques for successful professional development to be displayed more effectively than Ms. Morel's primary concern for production; therefore, teachers at Bayside had significantly more growth in self-efficacy during this professional development experience (Blake & Mouton, 1989; Farrell, 2001)

It has also been stated that seeing individuals similar to one's self manage tasks successfully also affects a person's self-efficacy (Bandura, 1994). The current research agrees with these findings. Teachers at both schools commented on the interaction of teachers' sharing experiences in the online community. These discussions led to comments such as, "I really can do this; it is not that hard," and "It made me feel better seeing he was thinking the same thing I was."

Teachers' Perceptions of Principal Participation

Four issues emerged when teachers discussed their reaction to principal participation in this experience: teacher insights into values of their principals, pressure associated with the experience, teacher perception of the role assumed by principals, and professional support given to teachers by the principals. Teachers at Bayside valued the suggestions made by Ms. McGrew, feeling that her comments added depth to each discussion. Conversely, teachers at Creekhollow were often disappointed in many of Ms. Morel's postings, finding many of the postings impersonal. Teachers at both schools noted that by simply allowing participation in the professional development, principals were showing their desire for a higher level of technology integration, as well as an importance for using technology with students. However, teachers at Creekhollow described Ms. Morel as valuing professional development and technology, but still emphasizing daily routines and rules over any other issues. Pressure given by Ms. McGrew during this experience was consistently seen as positive. Teachers were less consistent with reacting to the pressures given by Ms. Morel. Ms. Morel was often seen as aggressive, and teachers discussed how they felt Ms. Morel was 'watching' their online conversations.

Both Ms. McGrew and Ms. Morel were viewed as role models in this experience. Teachers at both schools commented on the fact that both principals were learning about technology with them and valued that participation. Bayside teachers expressed the importance of Ms. McGrew showing herself as a role model during face-to-face sessions, while Ms. Morel's teachers expressed the need for this physical interaction during the professional development experience. Lastly, when feedback was given in the online community by principals, teachers at Bayside were more receptive than teachers at Creekhollow.

The current study's findings support literature claiming that leadership is a primary factor in establishing and maintaining successful professional development (McLaughlin, 1991). Although the professional development was successful at both schools, the teachers at Bayside, where the principal was perceived as placing more value on technology integration, had more positive comments about the experience than teachers at Creekhollow. Furthermore, the findings of this study support the claim that principals must set high standards for teachers in terms of professional learning and must remain visible through the professional development in order for sessions to be successful (Morrissey, 2000). The current study extends these findings by discovering that principals can remain visible through an online community of practice, but must also remain somewhat visible in face-to-face sessions for teachers to feel fully supported.

The aim of this research was to explore online communities of practice as part of a technology professional development experience. It was determined that an online community of practice as part of a professional development experience could be an effective way to increase communication between principal and teachers, and among

teachers in a school. However, teachers also voiced a need for a community of practice that not only allows for collaboration among teachers at a school, but spreads to all middle school teachers within a district. It was also determined that different types of principal participation in the online community leads to different perceptions of principal participations. Although both principals involved fully participated in the online community, it was determined that techniques such as using humor, and supporting the personal and emotional side of teachers, as well as maintaining a visible presence in the face-to-face sessions is important to teachers feeling supported during professional development.

Implications for Practice

Type of Experience

Professional development, focused on the integration of technology, can be successful when designed as face-to-face sessions, delivered during middle school teachers' teaming period, combined with an online community of practice. Key aspects that led to the success of this experience were:

- The use of a needs assessment- teachers and principals had a voice in the topics to be delivered during the experience.
- Principal introduction to the experience- both principals in this experience gave attention to the opening of the experience. Principals used emails and face-to-face announcements to tell teachers that they were fortunate to be participating in the professional development experience.

- Composition of the online community- the use of thought-provoking weekly discussion board prompts and the availability of useful and relevant resources for each topic discussed.
- Effective online communication between principals and teachers and among teachers both during threaded weekly discussions and through email correspondence.
- Leadership style- the attention of principals to both the personal and professional support of their teachers and the attention to effective production during the experience.

Face-to-face sessions used in this experience were delivered two times per week for four weeks. Some teachers expressed the desire for a different schedule. Many teachers wanted the experience to be once per week, extending the training to eight weeks. Still more teachers expressed the desire to have the experience during summer holidays, where sessions could be longer than the given forty-five minute teaming sessions, and the professional development experience could be focused on exclusively.

Teachers also suggested changes for the composition of the online community. Although the community was effective within a school, teachers and principals in this study voiced the need for an online community that encompassed more teachers within the school district. Teachers from both schools believed that the interaction within the school was effective in the online community, but believed that interaction would be more productive if teachers teaching similar grades and subjects throughout the district were involved in one collective online community of practice.

Implications for How to Facilitate Participation

In this experience, the researcher served as the online facilitator. The facilitator is responsible for a number of elements key to the success of the professional development experience. These include the setting up and maintaining the online community. The facilitator should concentrate on producing thought-provoking discussion board prompts, which are essential to the momentum of the online discussion. The facilitator should also provide technical support to teachers having difficulty joining the online community. Lastly, this facilitator should provide useful, topic-specific resources, websites and professional articles, within the online community. When facilitating this experience, a leader within the school, such as a grade-level leader or teacher-coach, should assume the role of the online facilitator.

Principals in this experience must acknowledge best practice when it comes to leadership styles displayed. It was seen that leadership style was key in teachers' perceptions of principal participation in this study. Teachers in this study indicated that a more personal approach to dialogue is preferred. Techniques should include building peer relationships, emphasizing the importance of ongoing learning, and humor. The quality of postings made by principals is of great importance. Principals should make suggestions, offer assistance, and probe for clarification or more information to allow discussions in the online community to reach their potential. Both personal and professional support techniques should be used.

Principals should be well-versed in the techniques associated with transformational and transactional leadership. When facilitating this experience, principals in this study displayed characteristics of transformational and transactional

leadership. At Bayside, where transformational leadership was displayed, there was a growth in the self-efficacy of teachers as associated with confidence in utilizing new innovations. However, at Creekhollow, where transactional leadership was displayed, teacher unit plans received higher scores, showing that performance on the culminating activity of the professional development was better than at Bayside.

To enhance the overall experience, characteristics of both transformational and transactional leadership may be necessary. As stated by Leithwood (1992), transformational and transactional leadership characteristics can be complementary. Ms. McGrew's emphasis on personal relationships showed three goals of transformational leadership: helping staff members develop and maintain a collaborative school culture, fostering teacher development, and helping teachers solve problems together (Leithwood, 1992). This leadership style caused teachers to have a more positive reaction to her participation and contributed to the growth of self-efficacy of teachers. However, Ms. Morel's characteristics of transactional leadership, such as emphasizing the importance of day-to-day routines and products, allowed her teachers to create better products than those created by Ms. McGrew's teachers. Principals should use characteristics of transformational leadership, as well as those of transactional leadership, together to facilitate the best experience for their faculty during the professional development experience.

Face-to-face interaction with teachers was also seen to be a key element in teachers' feeling supported during the experience. Principals who use online communities of practice to facilitate professional development experiences should also occasionally participate in face-to-face sessions. Although the online community allows

teachers to ‘see’ their principal involved in the professional development, it was shown that some level of face-to-face interaction in conjunction with participating in the online community of practice aids in teachers feeling fully supported in the professional development effort.

Recommendations

This study strove to move beyond traditional professional development for middle school teachers concerning technology integration to demonstrate and study an effective way for teachers to communicate and collaborate using an online community. Furthermore, it moved beyond traditional principal support of a professional development experience by allowing principals to participate in the experience without the barriers of time and place. The results of this research contributed to the literature in both of these areas and provided implications for future research in the areas of technology professional development for middle grade teachers, principal support of that professional development, and the use of online communities of practice as a medium for that support.

This research showed that an online community of practice, added to existing face-to-face technology professional development, can be used at schools to increase communication and collaboration among teachers and to allow principals to support teachers and to be involved in a professional development experience. Further research is needed into the effects of an online community into teachers’ sense of self-efficacy. Although this study showed some of the effects of an online community of practice used in conjunction with technology professional development on a teacher’s self-efficacy, more quantitative data is needed to support the claims made in this study about the

experience with an online community increasing the confidence of teachers integrating technology. This research suggested that the self-efficacy of teachers was enhanced more at Bayside Middle than at Creekhollow. It is hypothesized that one reason for this discrepancy is the leadership style of the principal, transformational verses transactional. More research is needed to determine additional factors that affect teacher self-efficacy in a professional development program that incorporates principal support in an online community. Research is also needed into the correlation between increased self-efficacy due to transformational leadership and the integration of technology following a professional development experience such as this. Furthermore, research is needed into the long-term impact and sustainability of this type of professional development experience and the impact of transformational and transactional leadership on teacher technology integration and self-efficacy.

Additional research is also needed in the area concerning what type of online community is most effective. Based on the comments of teachers in this study, more research is needed on district-wide communities of practice, where teachers participating in the same technology professional development session, but teaching at different schools, are allowed to collaborate and communicate using an online community of practice, and how to facilitate participation in this type of community.

Using online communities of practice in conjunction with face-to-face technology professional development is an effective way to increase communication between teachers and their principal, as well as among teachers in a school. This study used the previous findings that stated that professional development is most successful when collaboration takes place and effective principal leadership is present (Johnson, 1981;

Liaw & Huang, 2000; Little, 1993; McLaughlin, 1991; Morrissey, 2000; Parr, 1999).

The online community in this study provided an opportunity for principals to increase communication with their teachers and allowed principals to gain further insight into what teachers were learning and producing during the professional development. The online community allowed teachers who normally do not communicate within a school to share ideas and concerns about technology integration. Insights gained from this and future research could be used by developers of effective technology professional development within a school district to design collaborative, supportive online communities to make technology professional development more meaningful for today's teachers.

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APPENDIX 1: TEACHER SUPPLEMENTAL MATERIALS

Daily Schedule

Week One: November 7-11	
Tuesday, November 8	Blackboard, NETS
Thursday, November 10	Pulling from Comprehensive Curriculum

Week Two: November 14-18	
Tuesday, November 15	Microsoft Excel
Thursday, November 17	Directed Browsing: Trackstar, Self-Report

Week Three: November 28-December 2	
Tuesday, November 29	WebQuests
Thursday, December 1	WebQuests

Week Four: December 5-9	
Tuesday, December 6	Writing Unit Plan
Thursday, December 8	Peer review Unit Plan, Self-Report

Week Five: December 12-16	
Tuesday, December 13	Focus Group Interviews, Principal Interview

You will be receiving 10 CLU's for this professional development: 6 for face-to-face participation, 4 for online community participation. Failure to participate in either will result in loss of CLU's.

Using Blackboard:

LOGGING IN:

- Go to the website <http://blackboard.community.lsu.edu>
- Login: your username is your first initial then last name_teach ex: cvavasseur_teach
- Password: default “password”
- In “my courses” click on Teachers Using Technology

CHANGING YOUR PASSWORD:

- Go to the website <http://blackboard.community.lsu.edu>
- Login
- Before clicking in the course, look to the left, under “tools” click on “personal information”
- Click on “change password”

PARTICIPATING IN THE DISCUSSION BOARD:

- Enter the class: enter “Teachers using Technology”
- On the left, click “groups”
- Enter your school’s discussion board
- Enter a discussion by clicking on the week’s title
- “Post a new thread” allows you to start a discussion
- If you would like to respond to someone’s posting, click the reply button at the bottom of the screen after reading

Online Community Discussion

General Discussions:

- Faculty Lounge: In this area, you can post general questions or concerns, or just chat with other teachers participating in this experience
- Management and using Technology: This discussion concerns management while students use technology. Please post successful management techniques, questions about management in the computer lab, or concerns to discuss.

Weekly Discussions (to be discussed in the group area by individual schools)

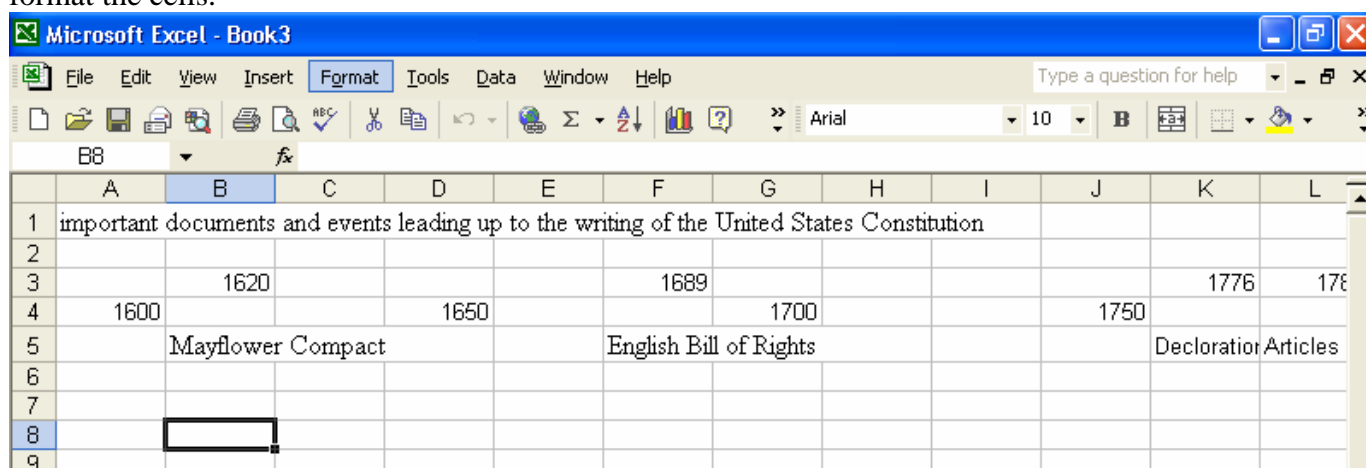
- Week 1: What do you believe are the two most important technology standards for your students and your content area? Given an example of how you can meet these standards in your classroom.
- Week 2: Please post the parts of the Comprehensive Curriculum identified for use with technology integration. How will using areas from science, math, and language, social studies work?
- Week 3: Directed browsing activities such as Trackstar and WebQuests are designed to allow students to research using the Internet safely. What concerns do you have with students and Internet safety and how could these concerns be addressed?
 - Scenario: 7th grade students in groups of 3 are working on a WebQuest on the Civil War in the computer lab. Although they are told to only use the resources listed, you find 2 students checking scores on lsusports.net. What do you do?
- Week 4: How does your student assessment in your unit plan address the guiding questions as identified by the Comprehensive Curriculum?

Making Timelines Using Excel

Entering Data:

1. Open Microsoft Excel
2. Enter a title for your timeline in cell A-1
 - Example: Important documents and events leading up to the writing of the United States Constitution
3. Row 4 will be your timeline. Enter dates at equal intervals, skipping 2 cells in between each date.
 - Example: Enter the year 1600 in cell A-4; 1650 in cell D-4; 1700 in cell G-4; 1750 in cell J-4; 1800 in cell M-4
4. Row 3 will identify the specific year where an event occurred.
 - Example: Enter the year 1620 in cell B-3; 1689 in cell F-3; 1776 in cell K-3; 1781 in cell L-3
5. Row 5 will describe the event that took place in the specified year.
 - Example: Enter 'Mayflower Compact' in cell B-5; 'English Bill of Rights' in cell F-5; 'Declaration of Independence' in cell K-5; 'Articles of Confederation' in cell L-5

Your Screen will not look like a timeline yet. The data appears non-organized until you format the cells.



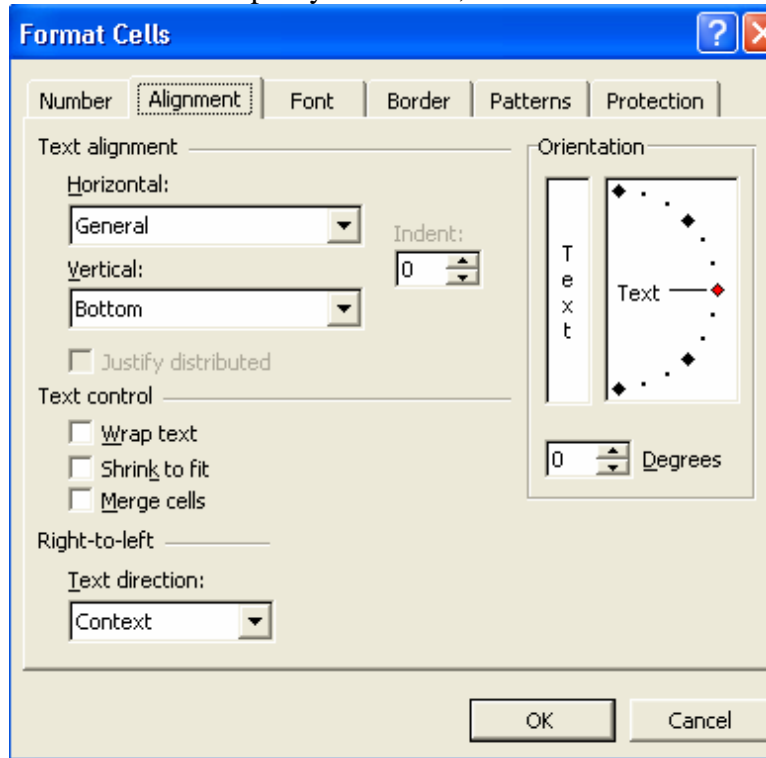
Formatting the Timeline:

1. Format the title:
 - Highlight cells A-1 to M-1 (or for another example, highlight until the last data entry)
 - Press the “merge and center button” (on the toolbar, it looks like the letter “a” with arrows pointing outward and a box around it)
 - You can change the font, make the text bold, etc to make the title stand out.
2. Format the timeline:
 - Highlight cells A-4 to M-4
 - To make the line more prominent, format the cells to stand out in the document

- Change the font to 20 pt.
- Use the 'fill' button (looks like a bucket on the tool bar) to make the cells colorful

3. Format Dates

- Highlight cells A-3 to M-3
- To make these dates more distinguishable, we will turn the alignment of the cells
- Under “format” at the top of your screen, select “cells”



- Rotate the text 45 degrees by clicking on the picture or entering a number in the degrees box
- You can center your text using the horizontal and vertical dropdown menus.

4. Format descriptions

- Highlight cells A-5 to M-5
- Under “format” click “cells” as you did above
- Rotate the text 90 degrees and center your text alignment

5. Finishing Formatting

- Highlight cells A-3 to M-5
- Add a border to your cells by clicking the ‘outside border’ tool on your toolbar (it looks like a square with a dropdown menu).
- Resize your Timeline by double-clicking on the line in between each column. For example, in between letters B and C on the top of your timeline, double click to resize that column.

The example looks like this:

The screenshot shows a Microsoft Excel spreadsheet titled "Microsoft Excel - Book3". The spreadsheet contains a timeline of events leading up to the writing of the United States Constitution. The title "Important events leading up to the writing of the United States Constitution" is centered in row 1, spanning columns A through M. The timeline is organized into columns representing years: 1600, 1650, 1700, 1750, and 1800. Key events are listed in row 5, with their corresponding years indicated by diagonal labels in the cells above them. The events are: Mayflower Compact (1620), English Bill of Rights (1689), Declaration of Independence (1776), and Articles of Confederation (1781).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Important events leading up to the writing of the United States Constitution													
2														
3			1620			1689					1776	1781		
4	1600			1650			1700			1750			1800	
5		Mayflower Compact				English Bill of Rights					Declaration of Independence	Articles of Confederation		
6														

Trackstar

Registering with Trackstar

- Go to the trackstar home page: <http://trackstar.4teachers.org>
- Click on “log in to make or edit a track.”
- Go to the new user registration form
- Enter your information into the system and submit. This creates you as a user of trackstar and enables you to eventually create your own tracks.
- The program will redirect you to sign in using your e-mail and password you just entered

Creating a Track

- Make a new track
- Enter a title,
- Click in the subject area and grade level that you are designing this track for.
- Write a brief description of the track you are creating.
- Choose the type of track you are making
- Click next, located in the top corner of the page
- You will then be directed to a creation page. This is where you create your track. Tracks usually consist of no more than 7 websites; however, depending on how much time your class will be using to complete this track, you can decide how many sites to use.
 - In the ‘title’ box, enter a title for the webpage
 - In the URL box, enter the web address
 - In the annotation box, enter an activity or a question you want your students to answer. Remember, you are talking to the students here!

Editing a track you’ve already started:

- Go to <http://trackstar.4teachers.org>
- Click “login to make or edit a track”
- Login using your e-mail and password you created during training
- A Welcome message should appear with your name and track listed
- Click “manage my tracks”
- A pencil should appear next to your track number. Click this pencil to edit an existing track.
- *Remember to write down your track number as your students will need to enter it to view your track*

Student Instructions for using a track:

- Go to <http://trackstar.4teachers.org>
- Scroll down and type in the track number under “view track number”
- Read the introduction then click “view in frames”

WebQuests: Designing from a template

STEP ONE: SAVING THE TEMPLATE

- Place the CD entitled “WebQuest template” into your CD drive.
- Go to “my computer” on the desktop and open your CD drive: you should see a folder entitled “WebQuest”.
- Right click the folder; go to “copy”; then go to your desktop, right click and “paste” the WebQuest template there. You are now finished with the CD. Take it out and save it until your next WebQuest, where you will do the same thing!
- Once saved, find the folder again; right click- “rename”. Rename the folder to illustrate the specific WebQuest you are now making (e.g. “Explorers”)

STEP TWO: MODIFYING THE TEMPLATE

- When modifying the template to create your own WebQuest, you must open each file from Microsoft Word. Once open, you can make changes to the text, background, add pictures, etc.
- You can only modify one page at a time. For example, if you have written your introduction and are ready to put it on the website, go to Microsoft Word, open the folder that you have renamed and open the page entitled “introduction”. Make the changes and press the save button. You can now close this page!
- Once you have made individual changes to each page and are ready to view your page as your students would, open the WebQuest without using Microsoft Word. From your desktop, find your new folder (whatever you renamed your template). Open the folder, then open the file entitled “index.html”. This will show you your WebQuest as the students would see it. Using the frames to the left, you should be able to see all pages you have made changes to!!

The most common mistake is to become frustrated because you can't modify a page. Remember, you must open a page from Microsoft Word to be able to modify it.

STEP THREE: TOOLS TO CHANGE THE LOOK OF YOUR WEBQUEST

- To add hyperlinks to your Quest:
 - Most of the time you do not want to place the web address in a quest, you simply want students to be able to click on a word and it bring them to a site.
 - To do this, first find a site and keep it open on your taskbar at the bottom of your screen.
 - Then type key words into your quest (e.g. Adventures of Columbus).
 - To make these words ‘hot’, highlight them, right click and press “hyperlink”.
 - As you can see, you can manually type in a web address using this screen. You can also click back to the page you have just found, then click back into Word. Word will automatically put the web address you just came from into the task bar.
- To change the background:
 - Open a page from Word.

- Put your cursor into the main page.
- Click on “format” – “background”. This screen will appear much like formatting the background in PowerPoint.
- You can also change the background of the frames (the clickable table of contents at the left) by opening the “index” page in word, placing your cursor into the frame and doing the same process.
- To insert a picture (clipart):
 - Click on “insert” – “picture”- “clipart”
- To insert a picture (from the Internet)
 - Go to the Internet and find a picture you wish to use. (I recommend www.google.com because you can ask google to search for only pictures by hitting the “Images” button above the search bar.
 - When you find a picture you want, right click- “save picture as”.
 - It is **very important** to save the picture to the same folder on the desktop as your web pages are in. If you do not, the picture will not insert. So, “save picture as” – find the folder on the desktop that you renamed in step one and save it to that same folder.
 - Go into word and open the page you wish to insert that picture on.
 - Click on “insert”—“picture”—“from file”. Find the folder you are working in, click on the picture you just saved and it will insert.

APPENDIX 2: SURVEY

Beliefs about Teaching and Technology

Teachers: Please take a moment to fill out this short survey. Your answers will remain confidential. This survey is designed to assess your perceptions of the use of technology in your classroom. Specifically, it will determine:

- the stage of technology integration at which you perceive yourself to be,
- the level of confidence you perceive yourself to possess with respect to using technology (in general) in the classroom, and
- the beliefs you possess about your capability to integrate technology, and therefore influence student learning.

Demographics. Please identify each:

Gender	
Age	
Years of teaching experience	
Highest degree received	
Grade taught	

Technology and Your Classroom: Please select one level of agreement for each statement to indicate how you feel.

SD= Strongly Disagree, D=Disagree, U=Undecided, A=Agree, SA= Strongly Agree

	SD	D	U	A	SA
1. Computers are valuable tools that can be used to improve the quality of education					
2. If there was a computer in my classroom, it would help me to be a better teacher					
3. I'm not afraid to let my students know I am still learning, too.					
4. I enjoy using new tools for instruction.					
5. I believe that I am a better teacher with technology.					
6. I need more training with technology.					
7. I need more training with curriculum and teaching strategies that integrate technology.					
8. Teachers should know how to use computers in their classrooms.					
9. I need more time to learn to use computers and the Internet					
10. I need more training with technology.					
11. I need to be able to try out technology-enhanced curriculum units in my classroom several times before I am comfortable with them.					
12. I need more opportunities to work with colleagues to become more proficient using technology-enhanced curriculum units					
13. Teachers get adequate support from the administration.					
14. I feel comfortable working with a computer					
15. Computers are necessary tools in both educational and work settings.					

16. Computers can be useful instructional aids in almost all subject areas.					
17. Computer applications are a good fit with my style of teaching.					
18. I should know how to successfully teach all relevant subject content to even the most difficult students.					
19. I believe that, as time goes by, I will continue to become more capable of addressing my students' needs.					
20. Even if I get disrupted while teaching, I am confident that I can maintain my composure and continue to teach well.					
21. If I try hard enough, I know that I can exert a positive influence on both the personal and academic development of my students.					
22. I am convinced that I can develop creative ways to cope with system constraints (such as budget cuts and other administrative problems) and continue to teach well.					
23. I can always manage to solve difficult problems if I try hard enough.					
24. I know that I can motivate my students to participate in innovative projects.					
25. I am confident that I could deal efficiently with unexpected events.					
26. I know that I can carry out innovative projects even when I am opposed by skeptical colleagues.					
27. I can solve most problems if I invest the necessary effort					
28. When I am confronted with a problem, I can find several solutions.					
29. I know the importance of computers and related technologies. I have some basic skills but do not think I have sufficient expertise to use technology without assistance. I rarely require the use of technology to complete assignments.					
30. I know the basics of many software packages and can select the appropriate one for a specific task. My students use a word processor or other basic software packages occasionally to complete assignments.					
31. I can use more than one software package in the creation of a single product. I use technology in preparation, instruction and evaluation. My students use a variety of software programs regularly in the construction of curriculum based products.					
32. I often use software to solve specific problems in ways I have not seen others try. My students use not only computers but other related technology equipment in curriculum based projects by analyzing resources and creating new knowledge.					
33. I share my knowledge of computers and related technologies through modeling, peer coaching and mentoring. I encourage students and co-workers to experiment with different software and technologies.					

APPENDIX 3: REVISED SURVEY

Beliefs about Teaching and Technology

Teachers: Please take a moment to fill out this short survey. Your answers will remain confidential. This survey is designed to assess your perceptions of the use of technology in your classroom. Specifically, it will determine:

- the stage of technology integration at which you perceive yourself to be,
- the level of confidence you perceive yourself to possess with respect to using technology (in general) in the classroom, and
- the beliefs you possess about your capability to integrate technology, and therefore influence student learning.

Demographics. Please identify each:

Gender	
Age	
Years of teaching experience	
Highest degree received	
Grade taught	

Technology and Your Classroom: Please select one level of agreement for each statement to indicate how you feel.

SD= Strongly Disagree, D=Disagree, U=Undecided, A=Agree, SA= Strongly Agree

	SD	D	U	A	SA
1. Computers are valuable tools that can be used to improve the quality of education					
2. If there was a computer in my classroom, it would help me to be a better teacher					
3. I'm not afraid to let my students know I am still learning, too.					
4. I enjoy using new tools for instruction.					
5. I believe that I am a better teacher with technology.					
6. I need more training with curriculum and teaching strategies that integrate technology.					
7. Teachers should know how to use computers in their classrooms.					
8. I need more time to learn to use computers and the Internet					
9. I need more training with technology.					
10. I need to be able to try out technology-enhanced curriculum units in my classroom several times before I am comfortable with them.					
11. I need more opportunities to work with colleagues to become more proficient using technology-enhanced curriculum units					
12. Teachers get adequate support from the administration.					
13. I feel comfortable working with a computer					
14. Computers are necessary tools in both educational and work settings.					
15. Computers can be useful instructional aids in almost all subject					

areas.					
16. Computer applications are a good fit with my style of teaching.					
17. I should know how to successfully teach all relevant subject content to even the most difficult students.					
18. I believe that, as time goes by, I will continue to become more capable of addressing my students' needs.					
19. Even if I get disrupted while teaching, I am confident that I can maintain my composure and continue to teach well.					
20. If I try hard enough, I know that I can exert a positive influence on both the personal and academic development of my students.					
21. I am convinced that I can develop creative ways to cope with system constraints (such as budget cuts and other administrative problems) and continue to teach well.					
22. I can always manage to solve difficult problems if I try hard enough.					
23. I know that I can motivate my students to participate in innovative projects.					
24. I am confident that I could deal efficiently with unexpected events.					
25. I know that I can carry out innovative projects even when I am opposed by skeptical colleagues.					
26. I can solve most problems if I invest the necessary effort					
27. When I am confronted with a problem, I can find several solutions.					
28. I know the importance of using technology in the classroom, but lack the expertise to successfully use it in my classroom.					
29. I can select, and my students can use, appropriate software for a given task in my classroom.					
30. I use technology in all aspects of my classroom, and my students use technology for learning often.					
31. I like to experiment with new technologies in my classroom, and my students enjoy using new technologies.					
32. I enjoy, and feel comfortable, helping others learn to use technology through peer coaching and mentoring, and allowing students to experiment with new technologies.					

APPENDIX 4: UNIT PLAN RUBRIC

Title:

Author:

Subject:

Grade Level:

ELEMENT	0 points	1 point	2 points	3 points	Point(s)
<i>Content</i>					
<i>CURRICULUM AND STANDARDS</i>	The lesson is not focused on a content area. The lesson provides no connection to local curriculum and/or state content standards.	The lesson is loosely focused on a content area. The lesson provides some/limited connection to local curriculum and/or state content standards.	The lesson is focused on a content area. The lesson provides clear connections to local curriculum and/or state content standards/benchmarks in some, but not all major phases of the lesson plan. The target audience is defined.	The lesson is tightly focused on a content area. The lesson provides significant and clear connections to local curriculum and/or state content standards/benchmarks in all major phases of the lesson plan. The target audience is clearly defined.	
OBJECTIVES (Objectives should define what students will know and be able to do.)	The objective(s) is (are) imprecise or unclear or written in terms of teacher behavior, rather than student behavior.	Some of the objectives are clear and some are not. Not all objectives are stated in terms of student behavior.	Each objective is stated in terms of student behavior; identifies the learning that will take place; and is measurable and observable.	Each objective is stated in terms of student behavior; identifies the learning that will take place; and is measurable and observable. At least 1 objective addresses higher order thinking skills.	
<i>Activities</i>					
LEARNING ACTIVITIES	Activities are disconnected and not focused on the objective.	Activities are connected to the objective but disconnected from one another.	All activities are aligned with the objective(s), build upon each other, are appropriately paced, and developmentally appropriate.	All activities are aligned with the objective(s), build upon each other, are appropriately paced, and developmentally appropriate. The activities are engaging, creative, and innovative.	
<i>Technology Integration</i>					
<i>Integration of Technology into the Lesson Plan (Does technology support instructional activity?)</i>	Technology is not included.	The inclusion of technology is clearly an "add-on," not complimenting the learning activities.	Technology is integrated into the lesson to improve the quality of student work and/or presentation.	A variety of technology is integrated appropriately throughout the lesson in a manner that enhances the effectiveness of the lesson and the learning of the student.	
STATE EDUCATIONAL TECHNOLOGY STANDARDS	K-12 The lesson provides no connection to the state technology standards and performance indicators.	The lesson provides little connection to the state technology standards and performance indicators.	The lesson provides significant and clear references to the state technology standards and performance indicators.	Emphasis on the technology standards and performance indicators are clearly seen through the major components of the lesson plan.	
<i>Evaluation</i>					

ASSESSMENT <i>(Assessment opportunities are ongoing and inform students)</i>	Opportunities for student assessment are not provided.	Assessment opportunities are loosely identified and make limited connections to Content Standards and lesson objective(s).	Assessment opportunities are identified and require students to apply knowledge or demonstrate understanding of Content Standards.	Assessment opportunities are clearly identified and require students to critique, assess, and/or draw conclusions as they relate to Content Standards.	
TOTAL SCORE					
TECHNOLOGY INTEGRATION					

APPENDIX 5: TEACHER NEEDS ASSESSMENT

Name _____ Grade Taught _____

Email Address _____

Please take a moment to tell me what technologies you would like to address in our upcoming training sessions.

Please tell me how comfortable you are using the following instructional tools:
VC= very comfortable; MC= moderately comfortable; NC= not comfortable

Software	VC	MC	NC
Microsoft Power Point: Allowing students to use this presentation medium to display knowledge they have learned.			
Microsoft Publisher: Allowing students to make brochures, postcards, menus, or flyers to display knowledge they have learned.			
Microsoft Excel: Allowing students to create charts and graphs to organize and display information; creating timelines in Excel			
Directed Browsing Activities: Trackstar: Allowing students to do safe, guided Internet research using the free website, Trackstar.			
WebQuests: Building and/or using inquiry-oriented activities in which most or all information used by learners is drawn from the web.			

Please indicate the potential value you believe the following programs will have for you as instructional tools in your subject area. HV= high value; MV= moderate value; NV= little or no value

Software	HV	MV	NV
Microsoft Power Point: Allowing students to use this presentation medium to display knowledge they have learned.			
Microsoft Publisher: Allowing students to make brochures, postcards, menus, or flyers to display knowledge they have learned.			
Microsoft Excel: Allowing students to create charts and graphs to organize and display information; creating timelines in Excel			
Directed Browsing Activities: Trackstar: Allowing students to do safe, guided Internet research using the free website, Trackstar.			
WebQuests: Building and/or using inquiry-oriented activities in which most or all information used by learners is drawn from the web.			

APPENDIX 6: IRB APPROVAL

IRB #: 3112 LSU Proposal #: _____

Revised: 04/15/2005

LSU INSTITUTIONAL REVIEW BOARD (IRB) for
HUMAN RESEARCH SUBJECT PROTECTION

APPLICATION FOR EXEMPTION FROM INSTITUTIONAL OVERSIGHT

Unless they are qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, all LSU research/projects using living humans as subjects, or samples or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

578-8692 FAX 6792
Office: 203 B-1 David Boyd Hall
Louisiana State University
Institutional Review Board
203 B-1 David Boyd Hall
225-538-8892
Robert C. Mathews, Chair

Instructions: Complete this form.

Exemption Applicant: **If it appears that your study qualifies for exemption send:**

- (A) Two copies of this completed form,
- (B) a brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts A & B),
- (C) copies of all instruments to be used. If this proposal is part of a grant proposal include a copy of the proposal and all recruitment material.
- (D) the consent form that you will use in the study. A Waiver of Written Informed Consent is attached and must be completed only if you do not intend to have a signed consent form.

to: ONE screening committee member (listed at the end of this form) in the most closely related department/discipline or to IRB office.

If exemption seems likely, submit it. If not, submit regular IRB application. Help is available from Dr. Robert Mathews, 578-8692, irb@lsu.edu or any screening committee member.

Principal Investigator Cynthia B. Vavasaur Student? Y Y/N

Ph: 225/936-8163 E-mail cindyvavasaur@cox.net Dept/Unit ELRC

If Student, name supervising professor Dr. S. Kim MacGregor Ph: 578-6900

Mailing Address 111H Peabody Hall, Louisiana State University Ph 578-6900

Project Title Teacher technology professional development and online communities of practice: Exploring the roles of collaboration and principal involvement

Agency expected to fund project N/A

Subject pool (e.g. Psychology Students) Middle school teachers

Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

I certify my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted.

PI Signature Cynthia B. Vavasaur Date 9/30/05 (no per signatures)

Screening Committee Action: Exempted Not Exempted Category/Paragraph B 2a

Reviewer Landy Signature Landy Date 10.3.05

Part A: DETERMINATION OF "RESEARCH" and POTENTIAL FOR RISK

This section determines whether the project meets the Department of Health and Human Services (HSS) definition of

research involving human subjects, and if not, whether it nevertheless presents more than "minimal risk" to human subjects that makes IRB review prudent and necessary.

1. Is the project involving human subjects a systematic investigation, including research, development, testing, or evaluation, designed to develop or contribute to generalizable knowledge?

(Note some instructional development and service programs will include a "research" component that may fall within HSS' definition of human subject research).

YES

NO

2. Does the project present physical, psychological, social or legal risks to the participants reasonably expected to exceed those risks normally experienced in daily life or in routine diagnostic physical or psychological examination or testing? You must consider the consequences if individual data inadvertently become public.

YES Stop. This research cannot be exempted--submit application for IRB review.

Continue to see if research can be exempted from IRB oversight

3. Are any of your participants incarcerated?

YES Stop. This research cannot be exempted--submit application for IRB review.

Continue to see if research can be exempted from IRB oversight.

4. Are you obtaining any health information from a health care provider that contains any of the identifiers listed below?

A. Names

B. Address: street address, city, county, precinct, ZIP code, and their equivalent geocodes. Exception for ZIP codes: The initial three digits of the ZIP Code may be used, if according to current publicly available data from the Bureau of the Census: (1) The geographic unit formed by combining all ZIP codes with the same three initial digits contains more than 20,000 people; and (2) the initial three digits of a ZIP code for all such geographic units containing 20,000 or fewer people is changed to '000'. (Note: The 17 currently restricted 3-digit ZIP codes to be replaced with '000' include: 036, 059, 063, 102, 203, 556, 692, 790, 821, 823, 830, 831, 878, 879, 884, 890, and 893.)

C. Dates related to individuals

i. Birth date

ii. Admission date

iii. Discharge date

iv. Date of death

v. And all ages over 89 and all elements of dates (including year) indicative of such age. Such ages and elements may be aggregated into a single category of age 90 or older.

D. Telephone numbers;

E. Fax numbers;

F. Electronic mail addresses;

G. Social security numbers;

- H. Medical record numbers; (including prescription numbers and clinical trial numbers)
- I. Health plan beneficiary numbers;
- J. Account numbers;
- K. Certificate/license numbers;
- L. Vehicle identifiers and serial numbers including license plate numbers;
- M. Device identifiers and serial numbers;
- N. Web Universal Resource Locators (URLs);
- O. Internet Protocol (IP) address numbers;
- P. Biometric identifiers, including finger and voice prints;
- Q. Full face photographic images and any comparable images; and
- R. Any other unique identifying number, characteristic, or code; except a code used for re-identification purposes; and
- S. The facility does not have actual knowledge that the information could be used alone or in combination with other information to identify an individual who is the subject of the information.

YES Stop. This research cannot be exempted—submit application for IRB review.

Continue to see if research can be exempted from IRB oversight.

Part B: EXEMPTION CRITERIA FOR RESEARCH PROJECTS

Research is exemptable when all research methods are one or more of the following five categories. Check statements that apply to your study:

1. In education setting, research to evaluate normal educational practices.



2. For research not involving vulnerable people [prisoner, fetus, pregnancy, children, or mentally impaired]: observe public behavior (including participatory observation), or do interviews or surveys or educational tests:

The research must also comply with one of the following:
either that

a) the participants cannot be identified, directly or statistically;

or that

b) the responses/observations could not harm participants if made public;

or that

c) federal statute(s) completely protect all participants' confidentiality;

or that

3. For research not involving vulnerable people [prisoner, fetus, pregnancy, children, or mentally impaired]: observe public behavior (including participatory observation), or do interviews or surveys or educational tests:

- all respondents are elected, appointed, or candidates for public officials.

Uses only existing data, documents, records, or specimens properly obtained.

The research must also comply with one of the following:

either that:

a) subjects cannot be identified in the research data directly or statistically, and no-one can trace back from research data to identify a participant;

or that

b) the sources are publicly available

Research or demonstration service/care programs, e.g. health care delivery.

The research must also comply with all of the following:

a) It is directly conducted or approved by the head of a US Govt. department or agency.

and that

b) it concerns only issues under usual administrative control (48 Fed Reg 9268-9), e.g., regulations, eligibility, services, or delivery systems;

and that

c) its research/evaluation methods are also exempt from IRB review.

6. For research not involving vulnerable volunteers [see "2 & 3" above], do food research to evaluate quality, taste, or consumer acceptance.

The research must also comply with one of the following:

either that

a) the food has no additives;

or that

b) the food is certified safe by the USDA, FDA, or EPA.

NOTE: Copies of your IRB stamped consent form must be used in obtaining consent. Even when exempted, the researcher is required to exercise prudence in protecting the interests of research subjects, obtain informed consent if appropriate, and must conform to the Ethical Principles and Guidelines for the Protection of Human Subjects (Belmont Report), 45 CFR 46, and LSU Guide to Informed Consent; (Available from OSP or [http://appl022.lsu.edu/osp/osp.nsf/\\$Content/LSU%20IRB%20Documents](http://appl022.lsu.edu/osp/osp.nsf/$Content/LSU%20IRB%20Documents))

HUMAN SUBJECTS SCREENING COMMITTEE MEMBERS can assist & review:

COLLEGE OF ARTS AND SCIENCES: MASS COMMUN/SOC WK/AG:

Dr. Noell * (Psych) 578-4119 Dr. Nelson (Mass C) 578-6686
Dr. Geiselman * (Psych) 763-2695 Dr. Archambeault(Soc Wk) 8-1374
Dr. Beggs (Socio) 578-1119 Dr. Rose (Soc Wk)578-1015
Dr. Honeycutt(Comm.Stu.) 578-6676 Dr. Keenan* (Hum Ecol) 578-1708
Dr. Dixit (Comm Sc./Dis) 578-3938 Dr. Belleau (Hum Ecol) 578-1535
Dr. Copeland* (Psych) 578-4117

ED/LIBRARIES/INFO SCI

BUSINESS

Dr. Kleiner (Middleton) 578-2217
Dr. Culross (Education) 578-2254
Dr. Landin* (Kinesiol) 578-2916
Dr. MacGregor (ELRC) 578-2150
Dr. Trousdale* (Curric & I) 578-2330

(* = IRB member)

VITA

Cynthia Beatty Vavasseur grew up in a small town in southern Louisiana. She graduated from St. Joseph's Academy in 1997. She graduated from Louisiana State University with an undergraduate degree in education in 2000, and a master's degree in 2001. In 2002, while teaching middle school in a small parish in Louisiana, she began the doctoral program in educational technology. Married with one young son, she has worked as a teacher in public schools, and as an instructor of educational technology at Louisiana State University. The degree of Doctor of Philosophy was rewarded to Cynthia at the May 2006 commencement ceremony.