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Teacher Beliefs on Personal Learning, Collaboration, and Participation in Virtual Communities of Practice

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This is to certify that the doctoral dissertation by

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2014

Abstract

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Rose M. Arnell

MA, Xavier University, 1999

BS, Xavier University, 1989

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Educational Technology

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Abstract

Virtual communities of practice have been used to improve teachers' instructional practice; yet many of these communities do not take into account the effect of teachers' personal learning and collegial collaboration beliefs on engagement within this model. The purpose of this qualitative case study was to examine if teaching was enhanced through participation in virtual communities of practice and determine if teachers' personal beliefs prior to entering these communities influenced their engagement. Wenger's social learning theory served as the conceptual framework. The research questions asked how teachers' beliefs on personal learning and their beliefs on collaboration influenced their engagement in virtual communities of practice and how personal learning networks facilitated extended technology-based learning in the classroom. Data were collected through 2 semi structured interviews with 9 teacher participants and analysis of digital records from the Classroom 2.0 and Flat Connections Nings. Manual, open-coding of the data revealed themes which explained the use of personalized learning networks for instructional growth and social networking for collaborative practice. Findings indicated that while teachers' previously held ideas were not significantly altered, the social, supportive environments created through virtual learning communities made a suitable setting for professional development. These findings may effect positive social change as virtual communities of practice for teachers evolve into professional development environments that challenge teacher beliefs, use progressive technologies, and engage teachers in collaborative activities.

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Dedication

To my dear, late friend, Robin Nance. Robin exemplified intelligence, strength and ambition. Her ability to handle life with dignity and grace were inspirational.

"Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light not our darkness that frightens us most. We ask ourselves, Who am I to be brilliant, gorgeous, talented, fabulous? Actually, who are you *not* to be? You are a child of the Universe. Your playing small does not serve the world. There is nothing enlightened about shrinking so that other people won't feel insecure around you. We are all meant to shine, as children do. We are born to make manifest the glory of the Universe that is within us. It's not just in some of us; it's in everyone. And as we let our own light shine, we unconsciously give other people permission to do the same. As we are liberated from our own fear, our presence automatically liberates others."

Marianne Williamson

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My children are more than just an inspiration. They are the heart it took for me to believe I could accomplish this task. Thank you, Quincey, Irie, and Eman for being my heart.

Maureen is more than just the truth. She is the soul that brought levity, reality, and understanding when she knew that I needed it most. Thank you, Maureen for being my soul.

Becky is more than just wisdom. She is the mind bursting with the possibilities of being greater than you ever thought you could be. Thank you, Becky for being my mind.

My mentors are more than just my mentors. They are the friends that never let me settle for less. Thank you, MaryFriend Shepard, PhD and Cheri Toledo EdD for being my friends.

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Chapter 1: Introduction to the Study

Online learning communities have the potential to be dynamic instruments for constructing knowledge and enhancing professional performance (Ernest, Heiser, & Murphy, 2013). The structure and design of these virtual communities of practice may lead to environments of open communication, collaboration, and reflection on teacher practice (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). While such a resource is invaluable in understanding teachers' practices in constructing knowledge, recognizing personal motivations for learning contributes to intentional program designs that align more closely with pedagogical beliefs. Beliefs influence practice; yet online learning methods rarely consider the personal dogmas that encourage sustained practice within these communities. Virtual communities must recognize teachers' espoused beliefs to ensure that the alignment of resources support the actualization of those beliefs (Ertmer et al., 2012). Through a richer understanding of the influential factors of personal learning, I uncovered how online learning for personal and professional growth was maximized for authentic transformation of educational practices in the classroom.

Chapter 1 provides an introduction to this qualitative case study research on the attitudes influencing sustained practice using the Classroom 2.0 and Flat Connections personalized professional development model. In this study, I explored how personal or professional pedagogy contributed to collaborative strategies and the influence it had on teaching. Wenger's (1998) social learning theory, which emphasized the role of social interaction for learning, provided the conceptual framework for this work. Relevant

definitions are provided, as is a discussion of the assumptions and delimitations. Nine teachers provided an in-depth investigation of real-life phenomena within the actual context (Yin, 2009). Once I identified how teacher beliefs and experiences influenced their practice, I created an effective professional development program development for teacher progress.

Background

Transforming learning and high quality interactive opportunities for teachers to work in collaborative communities enhances their professionalism (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). These experiences include time to learn from one another and to build the necessary momentum to influence professional learning decisions (Darling-Hammond et al., 2009; Hutchison, 2012). Through teacher empowerment approaches that included support systems, teachers are more likely to take risks in learning that promoted idea sharing and reflection on their teaching (Chen & Reimer, 2009; Ernest et al., 2013).

Understanding aspects of virtual learning communities facilitates the creation of paradigms that support learning for learners of all types. Transformational leaders must consider the elements that influence the development and sustainability of virtual professional environments. Leading through shared responsibility and acknowledging each participant's value strengthens the community and each member's level of engagement. Allowing time for participants to adjust to the transformations is more likely to result in long-lasting, effective communities (Classroom 2.0 website, 2013). Wenger

(1998) posited that a keen understanding of how people's experiences influence their understanding and interpretation of the world will most likely lead to mutual learning through shared practice. Both the human element, as well as the details of implementation, must guide the execution of these learning environments.

Sang, Valcke, van Braak, and Tondeur (2010) indicated that online learning environments that facilitate teacher professional development should enhance the potential for connecting pedagogy and technology. A full and successful integration requires a reframing of obsolete philosophies and "reconciliation between teachers and computers" (Sang et al., 2010, p. 1). Kopcha (2012) echoed this connection between pedagogy and technology by suggesting that a teacher's relationship with sound instructional practices and long-term experiences with technology had the potential to create changes in the way technology is used to support student learning in the classroom.

Virtual learning environments have become useful in their capacity to bridge distances between instructors, colleagues, and learners. The development of these communities occurred through a needs-based system, which often reflected the desires of administrations and stakeholders. Less is known about the motivations of teachers who use these virtual environments for learning as a means for personal and professional growth. Hutchison (2012) suggested that determining teachers' perception on how they would want to improve their learning environments would lead to a stronger foundation for these learning communities. Kopcha (2012) believed that an understanding of the role in which mentoring, communities of practice, and teacher beliefs played in creating an

environment that promoted technology integration was an area that needed investigation. Some researchers have examined how teachers' beliefs on personal learning and collegial collaboration influenced their participation in a peer-supported, self-designed, ongoing professional learning platform. In this study, I focused on the personal learning philosophies of teachers and how they contributed to successful participation in virtual learning communities. Implications for further use in planning contributed to an understanding of positive program elements that had the potential for designing thoughtful professional development.

The planning and execution of effective professional development for educators is a crucial step in transforming schools and raising student performance (Darling-Hammond et al., 2009; Kopcha, 2012). Teacher professional development has struggled to keep pace with the new demands of the 21st century (Abbitt, 2011; Tapscott, 2009). In a multiyear investigation of professional learning and teacher development, the United States has shown growth in the effort to build teacher content knowledge, yet lagged behind in providing teachers with the rich experiences that were likely to increase their abilities to have an impact on learning (Darling-Hammond et al., 2009). While traditional training models gave power over content and design to leaders driving the initiative, Richmond and Manokore (2010) found that the strongest impact was made when training practices included teachers as mentors. Shernoff et al. (2011) found that using mentors for collegial support played an influential role in the reduction of teacher isolation and chronic turnover experienced by some urban schools (p. 469). The power of teachers

working together served to help participants continue in their own professional growth and to grow additional leadership skills that allowed developing teachers to see the power of continuing engagement in professional development “from the inside.” This strategy had a positive effect on teacher learning as reflected in their desire to control their own professional learning.

Research Question 1 (Table 1) concerns the factors that are essential for positive, transferable, learning experiences that enhance teaching. Wenger, McDermott, and Snyder (2002) suggested aligning the professional development to the practitioner’s identity, thus creating a sense of ownership. Participants who have a stake in the community recognize the investment in their learning. Successful professional development communities make clear the benefits of participation (Wenger, 1998).

Communities of practice became more robust as members share information and experiences that allow them to expand their learning and develop professionally. These communities are specific or wide-ranging, but at the core they are characterized by participant engagement and the informal learning produced by its members. In education, virtual learning communities are distinctly used for teacher professional growth to affect student achievement (Wenger, 1998). While communities of practice are not a recent development, the online environment has expanded the range of possibilities in community development. The use of modern technologies has moved learning from local, face-to-face interactions to those where educators can connect and share ideas beyond their physical location using digital resources.

The longevity of traditional training methods has created teachers who are self-sufficient in constructing and delivering prescribed curriculums. Twenty-first century innovations have pushed teachers to move from isolated practices to "the openness of innovation" by including current technology into their learning environments and seeking support that creates knowledge through connections with colleagues in varying geographic locations (Baker-Doyle & Yoon, 2011, p. 77). The implications of advancing professional skills to meet societal progress adds to the foundation on which a more tailored learning experience for teacher professional development is built.

Students live in a fast-paced, multisensory world of cell phones, global video games, and instant messaging. The processes of learning and engagement have evolved to reflect the culture of the 21st century (Tapscott, 2009) to the point that the cognitive needs of digital age learners can only be met with a restructuring of curricula, instruction, assessments, and parent and administrative support. Ernest et al. (2013) suggested that the best way for teachers to make this radical transformation was to participate in online professional development in which they are exposed to the opportunities and challenges of collaboration in a virtual environment. This reorganization of ideas and curriculum is addressed through Research Question 2 (Table 1), which identified how teachers' beliefs on collaboration influenced their participation in virtual learning communities and prepared them for this new interaction.

The National Council of Teachers of English (NCTE; 2013) defined literacy as "a collection of cultural and communicative practices shared among members of particular

groups" (p. 1). The NCTE extended these literacies to incorporate the changes society and technology have experienced in the 21st century. These literacies include proficiencies in uses of technology and evaluation of multimedia texts, development of collaborative and cross-cultural relationships, and managing and synthesizing multiple streams of information (NCTE, 2013). While organizations call for educators to advance their skills to reflect these literacies, there are few models that are available to help educators become co-learners with their students (Nussbaum-Beach & Ritter-Hall, 2012, p. 2). Professional development must be current, accessible, and meaningful so teachers can collaborate with peers to learn new instructional techniques that address this generation of digital learners.

Independent teachers interested in personal and professional development worked through virtual communities of practice called Classroom 2.0 and Flat Connections. Virtual interactions supported teachers as they reframed personal learning and instructional practice to create 21st century teacher learning environments. Teachers participating in this community benefitted as they gained an understanding of 21st century instructional skills and created personal and professional networks for local and global collaboration. Through participation in the community, teachers used contemporary technology tools that supported connected learning and empowered them for leadership within a virtual professional learning community (Ernest et al., 2013; Ertmer et al., 2012).

In this study, I analyzed two virtual platforms, Classroom 2.0 and Flat Connections, and explored the impact teachers' beliefs had on their engagement within this model for personal and professional growth. An understanding of these ideas was necessary, as explained by Tondeur et al. (2011) who found patterns in teachers' attitudes and beliefs that pointed to the affect negative beliefs had on teacher learning. The participants were K-12 teachers who independently and voluntarily chose to participate in the Classroom 2.0 or Flat Connections platform. Interest, content, and specialization groups emerged as collaboration became the core of their work. Participation included asynchronous collaborations through the Classroom 2.0 and Flat Connections network and synchronous online web conferencing sessions. Opportunities for informal and formal communications between participants were a part of the process of developing and enhancing the teachers' personal and professional learning networks.

Online collaboration was at the center of this practice. In addition, meaningful discourse about professional learning and pedagogy accelerated teacher learning. *Critical friends'* feedback contributed to teacher empowerment and the transformation of beliefs on how educators contributed to student achievement and school success (Nussbaum-Beach & Ritter-Hall, 2012). Through timely feedback from Hargadon, the Classroom 2.0 owner, and community members, the Classroom 2.0 platform provided a supportive environment that allowed for a climate of inquiry that increased participant interest in continuous learning. J. Lindsay, Flat Connections developer and owner, used local and global connections to establish a community of sharing and learning (personal

communication, June 10, 2014). The responsive settings, collegial support, and teacher empowerment contributed to educators' motivated participation. The trust developed in this learning environment supported people sharing mistakes as well as accomplishments (Buckley & DuToit, 2010) and allowed for enhanced teaching and project implementation (Hall & Hord, 2011). Research Question 3 (Table 1) was designed to explore how teachers' belief on personal learning effected their engagement in these receptive learning communities. Strategy building in an open forum for discussion of ideas, practices, and questions was the foundation for transforming teacher pedagogy. Through teacher interviews and evaluation of the Ning contents, it was possible to either confirm or disprove whether personal beliefs on learning and collaboration influenced teacher participation in virtual communities of practice and if participation in these learning communities enhanced teaching.

Problem Statement

Through an analysis of how teachers' beliefs influenced their participation in communities of practice, a better understanding of how to accommodate the learning needs of teachers' personal and professional development emerged. An examination of how teaching was enhanced through the use of personalized learning networks provided insight into effective ways to align 21st century technology practices and professional development. In this study, I addressed the ways in which virtual communities of practice and networked groups contributed to effective teacher learning.

There is a relationship between the interaction of virtual community of practice participants and their implementation of technology in the classroom and its influence on their pedagogy (Palak & Walls, 2009; Sang et al., 2009; Slatter & France, 2010; Walker, Recker, Robertshaw, Osen, & Leary, 2011). It is not clear, however, to what extent classroom pedagogy and strategy was altered by personal or professional development experienced through a virtual learning community. The use of virtual communities of practice resonates with some teachers, as evidenced in their ability to align their new skills with the learning opportunities they create for their students. For others, the experience becomes a complex, ever-changing relationship in which the teacher resists shifting locus of control to the students (Slatter & France, 2010). Teachers need to become more comfortable in situations that require them to change. Teachable moments result in a role reversal as students take the central role in the authenticity of the learning experiences (Slatter & France, 2010). This was significant to Research Question 3, which concerned how teachers' beliefs of personal learning influenced their engagement in virtual communities of practice.

As the demand for choice and flexibility in access to professional development has increased, online learning has presented various possibilities to capitalize on technology (Palak & Walls, 2009). The challenge for educational leaders has been to provide participants with experiences that are purposeful and personalized. Classroom 2.0 and Flat Connections are collaborative virtual platforms that use technology to create a tailored environment providing teachers with meaningful experiences for professional

growth. Educators engaged in virtual communities of practice and enhance specific content-related challenges in their instruction while developing support teams within their professional learning network.

My research study filled a gap in understanding how the beliefs of teachers influenced their engagement in virtual communities of practice related to personalized learning and collegial collaboration. In this study, I exposed factors that informed how teaching was enhanced through participation in the Classroom 2.0 and Flat Connections communities of practice and use of personalized networks of learning. Twenty-first century methodologies in instruction and learning require that teachers continue professional development to discover how technology can support classroom practices. As teachers participate in professional learning communities, they are able to "bring about change and ultimately improve their own practice" (Maloney & Konza, 2011, p. 85). As teachers began to identify their proclivities in teaching, change occurs within the classroom.

Purpose of the Study

The purpose of this qualitative case study was to examine how teaching was enhanced through participation in communities of practice and to analyze how teachers' beliefs on personal learning and collegial collaboration impacted this participation. Communities of practice and personalized networks of learning were analyzed to determine their impact on enhanced instructional strategies. An investigation of

individual teacher values on learning and collaboration informed its influence on teacher engagement within virtual communities of practice.

Research Questions

The following questions formed the basis for this qualitative case study.

1. How is teaching enhanced through participation in virtual communities of practice and personalized networks of learning?
2. How do teachers' beliefs on collegial collaboration influence their engagement in virtual communities of practice?
3. How do teachers' beliefs of personal learning influence their engagement in virtual communities of practice?

Conceptual Framework

The conceptual framework for this study was Wenger's (1998) social learning theory, which emphasized the role of social interaction for learning and the potential of social learning communities. In the social learning theory, Wenger emphasized "learning as social participation" (p. 4). Wenger stated the "central aspect of learning" rests on the fact that by nature, humans are "social beings" (p. 4). This assertion applies to teacher professional development and sets the framework for recognizing how "social learning systems make it possible to understand learning as a social process" (Wenger et al., 2002, p. 226). Teacher communities of practice are often self-perpetuating. As members of a community of practice generate knowledge, they reinforce and renew themselves (Wenger et al., 2002). An understanding of the scenarios that contributed to transferable

learning through social interaction provided insight into teacher learning through participation in virtual learning communities of practice. These findings were used to answer Research Question 1 (Table 1), which concerned the ways teaching was enhanced through the use of virtual communities of practice and personalized networks for learning. An understanding of the factors within this cooperative setting was used to address Research Question 2 on how teachers' beliefs on collegial collaboration influenced their engagement in virtual communities of practice. Research results were also used to examine how the flexibility of communities of practice, specifically in Classroom 2.0 and Flat Connections, created a safe environment in which teachers' beliefs were challenged and supported. This spoke to Research Question 3, in which I examined teachers' beliefs on personal learning and its influential impact on social learning within communities of practice. Chapter 2 includes an analysis of the conceptual framework and a review of the literature related to educator professional development learning communities and technology integration.

Nature of the Study

A qualitative case study was used in this study. Yin (2009) posited that case study researchers focus on the how and the why of the research while supporting an in-depth investigation of real-life phenomena within its actual context. I examined the Classroom 2.0 and Flat Connections virtual community using this method to "retain the holistic and meaningful characteristics of real-life events" such as "small group behavior and organizational processes" (p. 4). In my study, an exploration of participants' motivations

to engage in collaborative Classroom 2.0 and Flat Connections practices was examined through “multiple sources of evidence” (Yin, 2009, p. 2). Collection of data in this natural setting provided information that was used as an evaluative tool of virtual learning communities. Investigation of a single-case study provided first hand access to a situation which offered valuable, descriptive information (Yin, 2009).

Purposive sampling was used to select nine teachers who participated in the Classroom 2.0 or Flat Connections virtual learning community within the last year. Participants represented a subgroup of teachers who continued to use this online tool to support their personal and professional growth. Merriam (2009) stated that the sample size should represent an adequate number of participants necessary to answer the research questions posed. When no new information would be revealed from discussion with further subjects, the sample size has reached a point of saturation. The Classroom 2.0 and Flat Connections platform were open to any interested teacher and did not have a set limit of teachers who could participate in this community. A participant group of nine provided rich details on factors related to this study that provided a “reflection of the number of case replications” (Yin, 2009, p. 58). The expectation was a reasonable interpretation of the phenomenon as identified by the purpose of the study.

The data collected were used to identify dynamics that personal beliefs on learning and collaboration had on participation within communities of practice. The data were analyzed through the triangulation of three sets of data: an initial interview (Appendix A) with each participant; a follow-up interview (Appendix B) and Ning

analysis of archived data (Appendix C) included in the Classroom 2.0; and Flat Connections Nings to interpret, confirm, and clarify questions that arose from the initial interviews. The cross checking of data collected through interviews from different participants with different perspectives and from follow up with the same participants provided internal validity for the study (Merriam, 2009). By pulling rich themes and patterns and using a constant comparison analysis to compare different participants' description of the Classroom 2.0 and Flat Connections environment, emerging themes evolved and gave meaning to the research.

Definitions

Collaboration: This is an instructional strategy in which everyone in the learning group performs a unique role to accomplish common tasks. Each learner works individually on the same topic and then shares with the group what he or she learned in order to deepen everyone's understanding (Nussbaum-Beach & Ritter-Hall, 2012, p. 12).

Connected learning communities: These are groups that connect and communicate in local communities (professional learning communities), global networks (personal learning networks), and bounded global communities (communities of practice), leveraging and bridging knowledge and expertise across these networks and communities to grow and continually improve professional practice (Nussbaum-Beach & Ritter-Hall, 2012, p. 28).

Critical friends: These are educators who come together to examine and improve each other's teaching and leadership activities and share meaningful feedback (Nussbaum-Beach & Ritter-Hall, 2012, p. 41).

In-service training: This is the continued professional growth of the teacher so the teacher can develop a positive attitude towards improving his or her own performance as a teacher, thus improving the quality of education imparted (Kothari, Patel, & Shelat, 2010).

Personal learning network: This is a system designed by educators to "further their short and long-range goals for professional growth and personal learning" (Nussbaum-Beach & Ritter-Hall, 2012, p. 31).

Professional development: These are the range of experiences which results in improvements in teachers' knowledge and instructional practice as well as improved student learning outcomes (Darling-Hammond et al., 2009, p. 4).

Professional learning communities: These include groups of teachers and administrators with shared responsibilities learning together with the goal of improving student achievement (Nussbaum-Beach & Ritter-Hall, 2012, p. 29).

Virtual platform: These are the online environments which support sharing, collaboration, and communication with people who share common interests (Dass, Dabbagh, & Clark, 2011, p. 98).

Assumptions

Three assumptions about the participants in the Classroom 2.0 and Flat Connections virtual communities of practice were made at the beginning of this research study. The following assumptions were considered in this study:

1. Participants had an intermediate level of technology expertise and could successfully navigate and contribute in an online environment. Previous personal experience or professional development had a technology focus and teachers had multileveled training in various technology applications.
2. The objective of a single case study was to provide results that were representative of typical conditions. The study of this Classroom 2.0and Flat Connections communities represented common virtual communities of practice due to the program specialization of integrating technology for teacher and student learning and was generalizable to conventional virtual professional communities of learning.
3. Participants would respond truthfully to the interview questions. It was taken for granted that participants would respond honestly to the initial and final interview questions.

Scope and Delimitations

In this study, nine educators identified how their beliefs on personal learning and collegial collaboration affected their participation within a virtual personal and professional community of practice. I also investigated how teaching was enhanced

through participation in Classroom 2.0, which was set up and managed by Steve Hargadon and Flat Connections owned and run by Julie Lindsay. The use of a single case study methodology allowed me to conduct an in-depth examination of these specific online communities. Through this research approach, the unique techniques applied through Classroom 2.0 and Flat Connections were generalized to "confirm, challenge, or extend the theory" (Yin, 2009, p. 47).

According to Merriam (2009), "case studies allow the researcher to get as close to the subject as they possibly can…to access knowledge about the phenomenon to which we would not otherwise have access" (p. 46). A signed letter of cooperation (Appendix D) from Hargadon for Classroom 2.0 and another from Julie Lindsay for the Flat Classrooms project (Appendix E) provided the necessary access to the Nings for this in-depth examination. While many aspects of virtual professional communities have been previously studied, the Classroom 2.0 and Flat Connections communities are widely used programs not validated by current research and thus became the focus for this study.

The delimitations considered for this study were as follows. First, the single-case study was delimited to nine teachers who were involved in the Classroom 2.0 or Flat Connections online personal and professional communities of practice that they willingly chose to participate in. Second, the sampling of online participants was restricted to members representing Grades K-12 who had access to the technology necessary for participation. Third, the participants had a working knowledge of

communities of practice strategies. In the case where more than nine teachers volunteered, the criterion used to reduce the number of participants was the length of time they had actively participated in this community. Participants with a longer history of use were considered first.

The potential transferability of the results of this study depends on the person seeking to apply it elsewhere. While "substantial descriptive data" allows transferability to be possible, these results are explicitly representative of the Classroom 2.0 and Flat Connections communities and their practices. Merriam (2009) stated, in qualitative research…a purposeful sample is selected precisely because the researcher wished to understand the particular perceptions of the participants in-depth, not to find out what is generally true of the many. Administrators and instructional technology leaders can use the results of this study to plan teacher professional development and minimize the factors that play a role in program dissatisfaction.

Limitations

As with any study, there are restraints associated with the process. Three limitations about the participants in the Classroom 2.0 and Flat Connections virtual communities of practice were made at the start of this research study. The following were considered limitations in this study.

First, participants joined the Classroom 2.0 and Flat Connections voluntarily. The use of a case study methodology had a bearing on research results. Yin (2009) identified four possible areas related to this approach that were considered limitations that were

relevant to this study. There was a possibility of bias entering the research while conducting interviews and while examining archival data. Reflective journaling of my perspectives during the process enabled me to record my biases. Second, in case studies, researchers focus on a single situation that may or may not be transferable to other groups. Typically, scientific facts are based on multiple iterations of an experiment whose results can be replicated (Yin, 2009, p. 15). I utilized the research data to expand knowledge in the field on attitudes towards virtual teacher interactions.

Another issue was the amount of time that was dedicated to conducting a case study which was lengthy and produced a considerable amount of data. I used modes of communication, such as Skype interviews and follow-up interviews that expedited the process and eliminated an overabundance of paperwork. If a participant was feeling pressured by time or responding with short answers, I asked him or her to reschedule for another time.

A final limitation was the ability to determine if the results of this study could be transferred to teacher involvement in any professional development model (Yin, 2009). In this case, participation in the Classroom 2.0 and Flat Connections model was examined and any results of the study were directly related to teacher interaction within this professional development model. These limitations were addressed in order to reduce any negative influence they had on the study.

Significance

As personal growth and professional development opportunities move to an online delivery mode, new understandings, strategies, and techniques on how to engage learners for continued participation must occur. Although several academic studies covering online professional development have been conducted, there are gaps in the research regarding the link between social learning theory and how personal beliefs influence learning and participation through engagement in communities of practice. The personalized, self- initiated teacher development environment in this study was available for any educator to join and participate in. Some felt inspired to continue using the tools and skills they developed through their use of the online network. The value of recognizing individual teacher beliefs and experiences helped me understand the factors that were essential in program design that boosted technology integration into teaching practices, which is the focus of both Classroom 2.0 and Flat Connections. This information guided planning so subsequent communities of practice were more effective.

The intent of this study was to explore the evolving field of virtual personal educational growth and professional development and to contribute to the transformation of practices in the field of online teacher learning communities. This study provided clarity on some of the motivating factors that affected teacher satisfaction regarding virtual opportunities for continued learning. In the data collected, I determined how closely a teacher's belief was related to his or her integration and use of technology as a learning tool.

This research on the Classroom 2.0 and Flat Connections communities of practice informed organizations about the specific details that helped teachers utilize virtual environments for their personal and professional learning. Through this knowledge, refinement of practices and philosophies were identified and used to initiate contemporary models that more closely aligned personal beliefs on learning and collaboration with programs that offered personalized learning and encouraged participation. Obsolete methods were reviewed, and data from this research provided necessary information for the innovative design of virtual professional development programs for educators.

This research contributed to the field of educational technology by recognizing how teachers' beliefs on personal learning and collegial collaboration impacted their participation in communities of practice for professional development. I also distinguished how teaching was enhanced through participation in these communities as well as through personalized networks of learning. No researcher had investigated the Classroom 2.0 or Flat Connections models, and this study guided future planning and design within virtual professional learning communities that resulted in effective teacher growth.

Summary

Chapter 1 provided the contextual setting for this research on how teachers' beliefs on personal learning and collegial collaboration contributed to their practice in the Classroom 2.0 and Flat Connections professional development communities. I also gave

a basis for the research in understanding how teaching was enhanced through participation in communities of practice. The evolution of professional development was present in numerous virtual opportunities that provided educators with greater access to resources and collaboration with other professionals. Personalized learning networks are an example of this virtual collaboration. The Classroom 2.0and Flat Connections initiatives empowered teachers to manage their professional development by creating personalized learning networks that facilitated growth. A distinction of how teachers' beliefs on the personalized networks and the collaboration they offered in this virtual arena was not present in the research and was recognized as a gap in the literature.

In Chapter 1, I also presented definition of terms specific to this research, as well as an explanation of how data were collected and analyzed. Wenger's et al. (2002) social learning theory and the concept of communities of practice were used as the conceptual framework to support the research. Chapter 1 concluded with a discussion of the assumptions, scope, limitations, and transferability along with the significance of this study and how the results contributed to the field of educational technology.

In Chapter 2, I review the current literature on the motivations of teachers' sustained practice using Classroom 2.0 and Flat Connections skills, which guided future design and programming of virtual professional learning communities. Wenger's (1998) social learning theory provides the structure for understanding the five stages of communities of practice for interaction and learning. Review of recent literature on communities of practice contextualized teacher professional development and the shift

towards virtual environments for teacher learning. An investigation of the Classroom 2.0 and Flat Connections communities and their practices provides a platform for examining individualized teacher communities for learning. A discussion of teachers' beliefs related to personal and professional learning provides an understanding of how it influenced their successful use of virtual communities of practice and its transfer to enhanced teaching practices.

Chapter 2: Literature Review

The intent of this qualitative study was to determine the impact teachers' beliefs on personal learning and collegial collaboration had on engagement in virtual communities of practice, specifically the Classroom 2.0 and Flat Connections, for personal and professional development. Teacher learning, as well as teacher professional development, has not kept up with the growth of technology in the 21st century. Virtual learning communities are one approach that enables teachers to facilitate the growth of their technological skills providing occasions for personal and professional development that help them learn to integrate technology seamlessly in their lessons.

Technology has the potential to reform teacher instructional practices that can support active student learning (International Society for Technology Education [ISTE], 2009). The purpose of Classroom 2.0 and Flat Connections is to equip teachers to include educational technologies as a regular part of teaching and learning. Researchers (Cifuentes, Maxwell, & Bulu, 2011; Hur & Brush, 2011) confirmed that opportunities such as customized learning and shared practices are central to the functioning of virtual learning communities. Online learning affords increased access to diverse and high quality materials (North American Council for Online Learning and the Partnership for 21st Century Skills, 2006). Well-structured learning environments encourage meaningful work and provided multileveled support for each participant. Duncan- Howell (2010) and Keown (2009) noted that virtual learning communities must have significance for teachers and deliver "just-in-time" professional development training that encourages

participation. Strong communities can leverage technology to facilitate interactions that support solving authentic problems (Tsai, Laffey, & Hanuscin, 2010). Teacher isolation is reduced as they contribute to networked groups (Baker-Doyle & Yoon, 2011). While much is known about the advantages of participating in networked communities (Wenger, 1998), less is known about barriers, and incentives to teacher knowledge sharing in online communities of practice (Baran & Cagiltay, 2010).

The paradigm for virtual learning and knowledge development has been altered by the technologically centered 21st century (Wenger et al., 2002). Revolutionary measures must be taken to educate teachers on how to create and participate in virtual communities of practice that support accessing external resources to advance their instructional practices (Wenger et al., 2002). While the Classroom 2.0 Network and Flat Connections Project are established projects, no empirical research was found on how teachers' beliefs on personal learning influenced their independent motives for continued practice and collaboration. There was a gap in the literature on how to articulate teachers' beliefs on personal learning and approaches to collegial collaboration and their continued voluntary practice in virtual programs. An understanding of how the use of educational technology tools that focus on transforming personal and professional development was examined to determine their effect in the classroom.

Chapter 2 is organized in two sections, a review of the current research literature on communities of practice and a detailed discussion of the conceptual framework that supported this research. In the review, I expound on virtual communities of practice,

technology integration, and factors contributing to teachers' continued practice in virtual learning opportunities. The conceptual framework was rooted in Wenger's social learning theory and communities of practice.

Literature Search Strategy

Current peer-reviewed scholarly journals were collected using Education Search Complete, Academic Search Premier, ERIC, and Google Scholar. Search terms included combinations of the following key words: *communities of practice, virtual communities of practice, networked learning, critical friends, professional learning communities, educational learning communities, professional learning networks, teacher education, continuous professional development, professional development, faculty, Web-based communication, virtual, online, social learning, learning spaces, academic/professional cohorts, virtual professional development, faculty learning communities, online teacher mentoring, collaborative learning, teacher pedagogy, online teaching, teaching presence, social learning, social networks, professional networks, educational, instructional, barriers, computer mediated communication, virtual collaborations, situated learning,* and *authentic learning.* As the literature research evolved, additional terms became apparent, which led to an exploration of further studies. These new terms broadened my search strategies and became useful in the cases in which there was limited current research within the last 5 years.

Conceptual Framework

Social learning theory underscores how individuals work and learn together through shared interactions and meaningful exchanges. These relationships are defined as the process of learning (Wenger, 1998). In the social learning theory, Wenger (1998) identified learning as an intrinsic social process that cannot be separated from the social context in which it happens. This social participation involves “groups of people who share a concern, a set of problems, or passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, 1998, p. 4).Wenger called these groups communities of practice (CoP).

When the common purpose is learning, CoP that support teacher learning have brought a greater understanding as to how teachers learn in collaborative environments (National Council of Staff Development, 2010). Positive discourse creates an active learning community (Swan, 2002), and authentic settings support risk taking that contributes to solving real issues related to work. Swan, Kratcoski, Mazzer, and Schenker (2005) referred to these authentic scenarios as situated learning. Swan et al. indicated that knowledge and learning are most effective when they are held within the learning context of study, which in this case would be a classroom.

Swan and Shea (2005) examined the concept of social learning and noted that there may be a link between social interaction and the development of learning communities. Through shared interactions, the learning community encourages teachers to become active contributors where knowledge construction could take place (Pella,

2011). Within communities of practice, all members, from novice to expert, contribute to and benefit from a restructured model of apprenticeship. In designing and implementing successful communities of practice for knowledge construction, a teacher must design a structure that encourages the participation of members of differing ability levels (Wenger et al., 2002).

The characteristics of a flourishing learning community feature the interactions between members that facilitate collective and shared understandings. These mutual beliefs and practices (Gu, Zha, Li, & Laffey, 2011) play a role in shaping individual and group knowledge. This concept, known as the *sociocultural* approach, is based on the notion that society and culture shape understanding. In a sociocultural study, Khoo and Forrett (2011) examined interactive involvement in the valued activities of the community that resulted in transformative changes in the participants. Members performed various roles with a range of responsibilities that contributed to the group's progress toward shared goals. Project success was not measured by product completion but rather through an understanding of the manners in which participants worked communally to develop knowledge. Groups examined learning through a social and cultural lens that allowed for open-minded sharing, which enhanced the identity of the communities of practice (Wenger, 1998, p. 11).

Wenger (1998) identified four interconnected elements that supported this social theory of learning. These elements include the process of active participation within a social learning community. With learning at the center of the theory, four components

extended from the center that was identified as practice, identity, meaning, and community. According to Wenger (1998), practice is defined as the sharing of resources and perspectives that sustain mutual engagement in action. It is the shared resources that support the members' relationships and interpretations of the world with everyday activities in real-life settings (Wenger, 1998, p. 13). This mutual engagement principle was confirmed by Pella (2011) who found that, through collaborative work, teachers participating in communities of practice shared their theoretical principles of learning. This combined effort gave value to the shared resources and cleared the way for a wider perspective in their work.

Another aspect of Wenger's social theory was identity. Identity is described as how individuals become part of the community and share experiences that relate to the overall goals of the group. It was this connection to the community that supported and influenced personal learning. The third component, meaning, extended the concept of identity by acknowledging each participant's contribution as an indispensable and meaningful part of the conversation. This element was echoed by Swan (2002) as she identified "valued and dynamic discussion" as an important factor that contributed to the success of online courses. Community recognized each member as being an essential part of the group, which allowed for comfortable interactions and relationships that were based on mutual respect and trust (Wenger, 1998; Wenger et al., 2002). These four components of active participation; practice, identity, meaning, and community, served as

the foundation of this social theory on which the concept of communities of practice was built.

Wenger's social theory recognized community as a force for learning and highlighted the human condition of socialization as a process for learning. Through collective interactions with others and an understanding of the environment, more knowledge was acquired as part of community than would be acquired independently. Wenger identified this as learning (Wenger, 1998, p. 45). Communities of practice are a purposeful tool used to transform practice and practitioners. Wenger's social theory addressed my first research question that sought to uncover how a teachers' learning theory inclined or deterred their participation in a community of practice. Interviews with teachers shed light on how these collective relationships compounded teachers' knowledge versus working in isolation and if the socialization of this process played a role in how he or she fostered learning in the classroom.

Communities of Practice

The concept of communities of practice exists in almost all social contexts (Wenger et al., 2002, p. 5). These community groups interact regularly and are formed based shared concerns or passions. Through networking, individuals deepen their knowledge and expertise. Many social groups can be considered a community; however there are three main characteristics that make a group a community of practice. The key structural elements of Wenger's (1998) model include domain, community, and practice. The *domain* makes clear the group's purpose and values by connecting the group's

members through participation, learning, and shared vision. The *community* encourages the development of relationships and mutual respect between members. This element is vital to the group's success because it is here that the process of learning overlaps with social interaction. Participants make themselves vulnerable during this process of openness and learning, which results in a more trusting and thus stable collaborative environment. *Practice* includes all of the information the group develops and shares. Specific knowledge, based on the group's initial interest, is created enabling members to effectively share within the domain.

The concepts of personal learning community and communities of practice both emphasize social learning. They are defined by the interaction and participation of their members. The principle focus of an instructional learning community is to create a collaborative and democratic environment in which authority and decision making was shared as teachers cultivated their professionalism to bring about student academic gains (Hord, 1997). This group has a shared vision and collective goals. In contrast, community of practice creation is more organic and naturally occurring. An emphasis is placed on the familiarity of its structure and in the collective sharing and managing of knowledge between its members. In a community of practice people "become informally bound by the value that they find in learning together" (Wenger et al., 2002, p. 5). Participant rapport and the socialization of the group became significant for learning and knowledge sharing.

Communities of practice began with open-ended possibilities that evolved into more accurate representations of their work. These transformations occurred continually as communities moved through each stage at their own pace. Research suggested there were “five stages of development for a community of practice: potential, coalescing, maturing, stewardship, and transformation” (Wenger et al., 2002, p. i). Stages 1 and 2 defined the process in launching a community of practice while 4, 5, and 6 spoke to the challenges of sustaining a community through its later stages of growth.

Stages of Participation

Stage 1: Potential. In this initial stage, groups formed as loose networks of people who discovered others with similar problems or interests. Informal conversations began to refocus the members’ relationships and a shared domain emerged. As a core membership developed, the community built momentum and identified common knowledge needs. This period allowed for envisioning of possibilities to which they can aspire. A strong community coordinator was essential during this stage, acting as a catalyst to get the group established and skillfully supporting the group as members found value in participation. Coordinators served as the liaisons between members and prospective resources beyond the group as they recognized the group’s potential and worked to build upon it (Wenger et al., 2002).

Stage 2: Coalescing. In this transformational stage, the community was focused on supporting members as they built trust and relationships. Community members began to seek each other out for help, which helped establish a strong foundation. It was

essential that during this stage community members were able to have honest discussions, knowing they were safe in their disclosures. It was only through these types of experiences that relationships deepened and a collective mentality around problem solving developed. During this stage, the community coordinator took time to establish the solid underpinnings of a successful community while continuously moving the group forward. Formal meetings were held and the organization of the group was solidified while private interactions between members were also facilitated. As the community began to take shape, more common ground was established and opportunities for sharing began to materialize. A new chemistry within the group emerged as it begins to unite (Wenger et al., 2002).

Stage 3: Maturing. It is in this stage that members experienced a more collective identity. The group members became more intentional about their techniques and strategies as they commit to their shared practice. Discussions and activities became more focused on problem solving and completing projects. Artifacts were generated and documentation of community knowledge took form. The members began to find gaps in the community's knowledge and reached beyond the scope of the group to find solutions. Group membership also changed requiring a refined process for welcoming newcomers (Wenger et al., 2002).

Stage 4: Stewardship. With an established identity, the group was comfortable changing focus and undertaking new projects during the stewardship stage. As this new vitality sustained the community, many changes occurred. Participants moved on and

leadership changed. During this time, reflection was effective in reevaluating shared values and refocusing on new goals that helped the group develop its potential. The community leader role became intensified as he or she continued to maintain energy and keep the community in the forefront in its field. Rejuvenating the community through workshops, recruitment, and new leadership helped to align the growth of the community with their practice. Building relationships with organizations outside of the group served to keep the community from becoming complacent as members carried on their practice and became authoritative voices in their domain (Wenger et al., 2002).

Stage 5: Transformation. During this final stage, the focus of the group became diluted and members felt less ownership and less connected. This natural disbanding or restructuring of the group indicated that the community had outlived its purpose. The group's original domain branched in many directions and no longer provided a singular emphasis. This transformation made mergers with other communities possible or the community dissolved itself altogether (Wenger et al., 2002).

McArdle and Coutts (2010) examined reflective practice and communities of practice as foundations upon which continuous professional development (CPD) could be built (p. 201). Reflection on practice challenged teachers to consider their skills in order to translate their experience into knowledge that informed practice. This internal dialogue allowed for meaning-making and was common to the process of learning. Even more necessary was the opportunity to engage with others for "shared reflection in a social setting" (p. 205). The community set the tone for challenges to thinking and critical

feedback of ideas. McArdle and Coutts (2010) determined reflection, combined with a community of practice would have a greater likelihood of resulting in deep sense-making for continuous professional development. This reflection can lead to "refined instructional approaches that encourage shared inquiry" (Chou, 2011, p. 432). It is the *collective process of negotiation* that mirrored Wenger's model and supported the effect that social interaction had in communities of practice.

According to Wenger et al. "The art of community development is to use the synergy between domain, community, and practice to help a community evolve and fulfill its potential" (2002, p. 47). The social dealings that advanced communities of practice were the foundation of the practice. The exchange of ideas about teaching and learning from a larger audience beyond resident groups brought added richness to the experience. Swan and Shea (2005) shared relevant research that reinforced online discussion among participants as a more equitable and democratic system of sharing. Customization of the learning community based on the needs of community members strengthened the investment its members had in the community. Deliberate understanding of how a well-balanced community encouraged participant engagement supported my research questions which aimed to isolate the conditions necessary for membership in virtual communities of practice that utilized technology to further teacher learning. Wenger's et al. (2002) social learning theory emphasized the need for new professional development opportunities and venues as we each become a more socially connected global network.

Current Research on Professional Development, Communities of Practice, Professional Learning Practice, and Technology Integration

A review of the literature indicated that professional development for educators is most likely to be successful if it meets the needs and motivations of the learner and if the focus of the learned skills meets the changing landscape of technology and the social needs of the digital learner. Hutchison (2012) stated that most teacher professional development is uninformed, "generalized for large groups, and not driven by teacher needs" (p. 38). Teacher collaboration in an online environment allows educators to share, collaborate, challenge, and network with others to support teacher training, learning, and reflection. Wenger (1998) maintained that knowledge is a process shaped by social interactions that play a central role in the development of cognition. Virtual professional learning communities such as Classroom 2.0 and Flat Connections provide opportunities for individual participants to share individual knowledge and expertise, which characterizes Wenger's social learning theory (1998) that people learn from one another through interaction and sharing. These virtual learning communities provide an added layer of learning and sharing as participants mutually learn through technologically immersed experiences and practices. The research indicated that learning communities have the power to influence practices that can reform education.

Teacher Professional Development

Using a social learning theory framework to structure the development of online communities provided new possibilities in the facilitation of teacher professional

development. Wenger et al. (2002) noted that building knowledge is a social process and it is through communal involvement that a body of knowledge is formed (p. 10). Strong professional development includes interactions with peers that encourage participation, remove barriers, and inspire collaborative sharing of knowledge and resources. Through a social approach, teachers, as learners, can “share knowledge in living ways rather than in the form of a database or documentation” (Keung, 2009, p. 101). Online professional development communities that are grounded in a social framework have the potential to transform teacher professional development where teachers join colleagues in learning how to “promote desirable instructional and pedagogical changes” (Berry, Daughtrey, & Weider, 2010, p. 45).

The teaching profession continuously regulates itself to meet the demands of new educational policies and current trends. This includes professional training and education for teachers. "Professional learning can have a powerful effect on teacher skills and knowledge, and on student learning if it is sustained over time, focuses on important content, and is embedded in the work of professional learning communities that support ongoing improvements in teachers’ practice" (Darling-Hammond et al., 2009, p. 9). Richardson (as cited in Duncan-Howell, 2010, p. 324) noted that teachers seem to continually attend workshops to "learn new skills, update their knowledge, and change classroom practices.” While continued professional development is an important practice in any field, considerations must be given to authentic content and meeting teacher needs through modes of delivery (Duncan-Howell, 2010). Just as the field of teaching adjusts

itself to policy trends, so must the designers of professional development who seek to prepare teachers for the changing environment.

In 2010, The Stanford Center for Opportunity Policy in Education created a technical report on professional development in the United States. They noted the trends and challenges of the common practice of teacher professional development including short-term workshops and single session conferences. The report indicated that these types of professional development were "unlikely to influence teaching practices and student outcomes" (Darling-Hammond et al., 2009, p. 1). The research suggested that there were certain factors that contributed to high quality teacher professional development such as common planning and opportunities for teacher self-reflection. These factors had the potential of supporting a teacher's ability to refine instructional practice that may have an impact on student learning.

Their recommendations indicated that professional development should be designed to engage teachers in active learning on topics that were meaningful to them, be connected to teachers' collaborative work in school-based professional learning communities and learning teams, and be presented in an intensive, sustained, and continuous manner over time. Siemon (2009) stated that teams working collaboratively and interactively allowed teachers to identify their learning needs which created a greater likelihood for improving educational outcomes (p. 231). The application of appropriate technology measures supports collaborative teacher professional development as it makes available suitable tools for social interactions (Cifuentes et al., 2011). Darling-Hammond

et al. (2009) recommended that professional development methods be innovative and reflect 21st-century best practices for teachers. Duncan-Howell (2010) surveyed a group of teachers to provide insight into their professional development experiences and attitudes toward virtual learning communities. They found that teachers who were members of virtual communities felt that participation was practical, authentic, and relevant to them. An understanding of these results shed light on this research study's second question, which investigated how teachers' beliefs on learning influenced their participation in virtual teacher learning communities.

Tsai et al. (2010) investigated an online system called NETworks that was run on the Sakai 2.0 platform. This virtual community supported professional collaboration between pre-service, in-service, and university educators. Participation in the Sakai 2.0 platform improved teacher sense of community as they interacted with others in online discussions and changed their perception of how to effectively use educational technology to interact with distant colleagues. Similarly, a study in Pakistan by Kasi (2010) supported teachers as they moved from the transmission method of instruction to communities of practice that connected novice, experienced, and university teachers for teacher collaboration and professional growth. This research pointed to the potential effectiveness of virtual communities for teacher learning and professional development.

Professional development goals include improving educators' professional practice in ways that will benefit student achievement. The goals are used to provide educators with the opportunity to develop their professional knowledge, skills, and

attitudes. These opportunities suggest positive growth yet the research on professional development conducted by Wei, Darling-Hammond, and Adamson (2010) indicated that teachers within the United States received less professional development and planning time compared to teachers in other high-achieving countries. “In order for our students to succeed, their teachers must also be supported to succeed” (Wei et al., 2010). The information provided by this research study brings to light which aspects of professional development have the greatest impact on teacher and student growth.

Professional Learning Community

Reform in teacher professional development includes creating a school climate in which faculty members grow in professionalism and competence. Professional learning communities provide the context for professional explorations and foster collaborative endeavors (Hall & Hord, 2011, p. 26). Hall and Hord, leading pioneers in professional learning communities, defined personal learning communities as having these five dimensions:

- Shared values and vision**:** The commitment of the staff to student learning, which is referenced for the staff's work.
- Collective learning and application: The identification and implementation of staff’s learning in order to more effectively address students’ needs.
- Supportive and shared leadership: Jointly held power and authority that involves the staff in decision-making.

- Supportive conditions: Physical and human capacities that promote collaborative organizational arrangements and relationships.
- Shared personal practice: Feedback and assistance from peers that support individual and community improvement (2011, p. 27).

Personal learning communities are interactive and sustain the work of the group provided the emphasis is focused on collective interactions within encouraging environments.

The ultimate outcome of an effective personal learning community is the "intentional learning of the participants and their application of learning in their classrooms or other organizational settings" (p. 29). It is this collective learning affected by the members of the personal learning communities that continually contribute to the quality of teaching and student learning. DuFour, DuFour, Eaker, and Many (2010) supported Hord's (1997) theories of personal learning communities in their guide, *Learning by Doing: A Handbook for Professional Learning Communities at Work.* DuFour et al. (2010) noted that the collaborative team is the central building block of a personal learning community. Members recognize that in order for all students to reach high levels of learning collaboration is a necessary and fundamental part of the process. The school culture must be rooted in collaborative practices that support higher quality work in personal learning communities.

Huggins, Scheurich, and Morgan (2011) also saw school culture and leadership as critical to changes in teacher practices. In a diverse, urban high school, a math personal learning community was studied to determine the factors that contributed to the growth of

the community. They found that school leaders were responsible for ensuring that personal learning communities followed research-based approaches to improve teaching strategies. Miranda and Russell (2011) concurred as they found that district-level factors and school-level leadership were important contributors in the culture of these learning communities (p. 303). The process of collaboration had to be fostered due to the fact that merely giving teachers time to collaborate did not guarantee success. Most importantly, the authors stated that while professional autonomy is an important aspect of a personal learning community, strong administrative leadership, and direct participation in the process "drives changes in teaching behaviors that lead to improved learning" (p. 84).

In a study done with secondary science teachers in Bangladesh, Rahman (2011) emphasized that the culture of professional sharing among these science teachers lacked collegiality. Sharing knowledge and experience was not typical and teachers felt responsible for mainly themselves and their students. They introduced a *peer pair* intervention process with seven teacher groups. In pairs, one teacher taught topics from the secondary curriculum while the partner observed and reviewed the lesson. Teachers then reviewed and reflected on their notes about that lesson and discussed issues such as resources and learning environment. All seven groups then came together to share topics of concern or interest that were notable. After the first teaching session, in which both peer pair members taught lessons, they reported feeling nervous and hesitant sharing their observations with their colleague. After the second cycle of teaching and observations, the teachers began to change their beliefs about professional practice. The intervention

process increased the teachers' confidence in collaboration and gave them a proven collaborative strategy to improve their practice. Rahman (2011) cited Hord when he stated that "one of the defining characteristics of a personal learning community is that of power, authority, and decision making as being both shared and encouraged" (p. 4). The understandings from this research may guide in the development of alternative ways that foster teacher teamwork.

A narrative study, conducted in a secondary school in the Australian state of Tasmania, sought to distinguish the difference between professional development and professional learning. Melville and Yaxley (2009) saw this redefinition as a critical understanding to contributing in a competitive and globalized world. Traditional professional development included teachers gathering to listen to a visiting expert then breaking into discussion groups. This method exaggerated the external control of outdated professional development techniques. Professional learning, they argued, placed teachers in control of their learning rather than being "passive recipients of other's ideas" (p. 359). Avalos (2011) stated that educational organizations have moved away from traditional in-service teacher training models as leaders have come to understand the role contextual factors play in designing models that incorporate teacher needs.

As teachers become involved in redefining their teaching practices, they become more responsible for their learning and endeavor to be more effective. Their personal motivations to learn become central to their desire for knowledge (Melville & Yaxley, 2009). This speaks to the need for teachers to become self-directed in their professional

learning. The globalization of society has restructured traditional learning environments and resources can now be accessed around the world. The social implications of this are far reaching, as we can no longer solely rely on books or the Internet for information. The ability to interact globally extends the range of new topics of exploration which requires a professional and personal curiosity that will guide learning. Self-direction, initiative, and interest will direct the creation of groups that sustain these pioneering communities of learning.

Within effective professional learning communities, participants learn through active participation in community activities they value. The social interaction of this process begins to influence each group member and the community as they move toward shared learning goals (Wenger, 1998). Khoo and Forrett (2011) determined that these social and emotional transformations help distinguish between participation and interaction. They studied an online master's level course in order to understand how student groups worked together to support each other's learning. Their research emphasized the need to recognize the "intellectual, social, and emotional aspects of learning and knowledge" as valuable parts of shaping participant knowledge (p. 138). Their distinction between participation and interaction echoed Wenger's social theory of learning and community building. Khoo and Forrett (2011) noted that participation looked to the development of relationships and identities as people in groups work to achieve shared goals. Interaction, reciprocally, can be understood as the exchange and dialogue between participants that served purposes related to intellectual, social, and

emotional needs. “Social learning theory indicates that teachers gain new knowledge while participating in communities of practice” (Hur & Brush, 2009, p.281). A social learning model facilitates multi-leveled interaction between participants that contributes to the collective knowledge of group members.

Virtual Communities of Practice

According to Wenger et al. well-established communities of practice provide a point of stability between organizations that have distant relationships (2002, p. 136). Members of virtual teams rarely meet with the entire group and typically have more interaction with local rather than remote participants. Global teamwork has the potential to create even more obstacles that may cause interactions to function less optimally. Company reorganization that responds to market changes often creates fluctuations in group members, team managers, and business units. These connections and relationships can become disjointed, even to the point of failure. The use of stable virtual communities of practice, with peers who have long-lasting relationships, serves as a constant structure that removes those barriers and allows social and interactive experiences to bridge the gap created by distance. Strong virtual communities allow distant participants to feel connected to the entire team (Wenger et al., 2002).

Wenger et al. (2002) stated that learning involves the interplay between the local and the global community, which requires a systematic method that supports the development of this new balanced process of learning. Palloff and Pratt (2005) concurred that communities must be organized and stated that leaders of virtual teams must possess

an understanding of human dynamics and national cultures, and then possess the ability to negotiate communication and collaboration through computer technologies. This definition asserts that community members can expect supportive interactions that allow for a deepening of their sharing and learning experiences. However, lack of support may contribute to discontinued practice within virtual professional development environments. Collective practices create a "shared accountability critical to practice" (Baker-Eveleth, Chung, Eveleth, & O'Neill, 2011, p. 33), so strong leadership, and collaborative engagement increase the likelihood of success in a virtual or online environment.

Online communities thrive when the technological infrastructure is in place before the launch of the program and participants are familiar with the tools (Wenger et al., 2002, p. 198). This permits the development of a productive platform for collaboration. Palloff and Pratt (2007) posited that the success of an online classroom is correlated with student satisfaction, teacher facilitation, and clearly communicated objectives. Social presence, or the ability to be perceived as real in an online environment, is also paramount (Khoo & Forrett, 2011; Swan, 2002; Swan & Shea, 2005). Skilled facilitation in learning environments contributes to pupil success. This can be accomplished through supportive tactics such as keeping participants on task and encouraging an examination of materials at a deeper level. Regardless of the environment, a competent teacher's presence, whether virtual or real can be transformative to learning.

Baran and Cagiltay (2010) researched communities of practice as an *enabler of knowledge management* model. This framework became the lens for understanding the social structure of online environments. Their research sought to understand how communities of practice reinforced the transmission of knowledge between people. This study looked at two research groups, one which required mandatory participation and the other voluntary participation. The researchers discovered that online communities provided a platform for teacher dialogue that opened their minds to different perspectives and ideas, which also changed their beliefs about their practice. This reflection on practice allowed for discovery, development, and empowerment (Kasi, 2010), which would support knowledge building and a sense of belonging which would contribute to a stronger virtual community (Thang, Hall, Murugaiah, & Azman, 2011). The level of motivation between the groups was evident as the voluntary group members were intrinsically inspired to be interactive, while the strict rules of participation in the mandatory group became a handicap.

These results mirror what Maloney and Konza (2011) found as they identified the factors that influence teacher levels of engagement in communities of practice. The value placed by each individual on professional development and the terms of the shared culture were factors in the level of participation in this professional learning community. The professional investment teachers were willing to make depended on their perceived relevance of the task. This sheds light on the research questions for this study regarding the importance of understanding the motivations behind participation or nonparticipation

in professional development communities of practice. Research indicated that teachers could bring about change and improve their practice through participation in a supportive learning community.

A virtual learning community is a social network in which each participant provides knowledge to the network. That knowledge is then shared throughout the network and connections are developed between the participants, resulting in the creation of connected knowledge. Wenger's (1998) social theory of learning focused on these groups of sharing and emphasized what members did together and on the "cultural resources they produced in the process" (p. 283). This understanding, applied to today's digital age, acknowledges that the acquisition of new information enables networked learning that constantly changes to meet the needs of the learners. Duncan (2012) agreed that in order for the learning process to be successful, the environment must consider specific teacher needs and learning concerns. In virtual learning communities, such as Classroom 2.0 and Flat Connections, participants are connected via a network and each participant is a node who supports the interdependence of the community by providing information, experiences, and knowledge. The knowledge is then managed and shared on an accessible electronic platform network. In the case of Classroom 2.0 and Flat Connections, group resources were shared on a network Ning. This venue was accessible to all networked participants for the sharing of ideas, topical discussions, and for varying levels of support.

Virtual learning communities require that groups of teachers collaborate to identify common goals to deepen student learning, to develop lessons, and to discuss the evidence from data gathered. This shared process brings teachers out of the traditional classrooms to discuss lessons and pedagogy with the goal of improving teaching and learning. A study conducted by Guasch, Alvarez, and Espasa (2010) analyzed university instructors' training experiences to determine best practices in facilitating growth within collaborative settings. They determined virtual environments should foster "strategic thinking and meaningful building of knowledge" (p. 200). They noted this growth in thinking was difficult to develop independently and a collaborative model which includes support from various educational professionals would increase the likelihood of success. They acknowledged that while virtual environments extend discourse and sharing typical in face-to-face encounters, virtual communities were still new environments which called for new teacher competencies.

Keung (2009) studied teacher interactions within virtual communities of practice through a school improvement plan called The Learning Study project. His work analyzed the reflective practices of primary teachers in Hong Kong by creating communities of practice that supported teacher involvement in design, implementation, and evaluation of lessons aimed at enhancing student learning through teacher professional development. The Learning Study project research method focused on practitioners researching their own teaching practices. This research paralleled Rahman's (2011) study in which small teacher groups worked together to teach a lesson while being

observed by colleagues. Reflection on the videotaped process included recommendations for instructional improvement and curricular reform. These efforts resulted in teachers becoming reflective learners who became enriched by "practicing the theories postulated from others" (Keung, 2009, p. 83). As professional learning environments become a prevalent means for teacher learning, there is a greater need to engage in deeper reflection on the practices that relate to teacher growth (Riveros, Newton, & Burgess, 2012). Both studies concluded that communities of practice created a valuable opportunity for teacher learning and professional development.

Richmond and Manokore (2010) analyzed teacher discussions to identify the critical elements of a sustainable professional learning community. They examined if *teacher talk* could give insight to shaping teacher pedagogy and practice. The findings indicated that participants in professional learning communities showed a deeper understanding about teacher practice from community members than they did from non-project colleagues. Teachers' recognized their ability to act as change agents in their field and remained committed to not regressing to teaching science using outdated practices. Ertmer and Ottenbreit-Leftwich (2010) agreed that the 21st century provides progressive tools for change and instead of relying on those tools to drive change; teachers can transform their practice by acting as agents of change in their fields. Participants become empowered as life-long learners when they were able to constructively participate in collaborative endeavors that have an impact beyond the classroom.

In direct contrast, McCluskey, Sim, and Johnson's (2011) study magnified the disadvantages of not being part of a supportive community. Ten early career teachers from Asian and European countries traveled to Queensland to share their perspectives and experiences in order to determine the role communities of practice played in their development of professional knowledge. One Asian teacher's experiences stood out in her description of feelings isolated and lonely. As she looked for opportunities to be included in the teaching community within her school, she was always on the outside. She had limited interactions with other teachers, and although open invitations for assistance were made, her colleagues were not available to her. The researchers identified sub-themes such as physical appearance, worldliness, and conversational differences that kept participants from being embraced into communities. Wenger (1998) noted that unfamiliarity with a group might result in limited or non-participation in community activities and suggested that as we learn more about other people, the characteristics by which we identify ourselves become more evident. Shernoff et al. (2011) contend that experiences of isolation can be meditated through professional learning communities as they provide greater opportunities to collaborate with local as well as distant colleagues.

This was the case in the previous research study, where teachers felt they were *peripheral participants* of the community of practice. Being on the outer edge of the community was a reflection of the status of the newcomers. Wenger believed that being on this inbound trajectory can be a natural part of the learning process for newcomers as they find their way into and within these professional communities. The contrast between

these studies draws attention to the value of communicative practices among varying groups. As education becomes a more socially connected global system, the opportunities for worldwide collaboration increase. This provides an opening for innovation in professional development that calls for strong uses of technology that support far-reaching virtual communities of practice for teachers.

Classroom 2.0 and Flat Connections

A growing need exists for innovative professional development delivery methods that cater to personalized learning needs and make varied opportunities for learning more accessible. Nussbaum-Beach and Ritter-Hall (2012) pointed out that "professional development in the 21st century can be do-it-yourself based on your needs, interests, and passions" (p. 97). Classroom 2.0 and Flat Connections deliver this practical form of professional development through teacher collaboration and support within the network. This collaboration can lead to new teacher experiences within his or her classroom.

Tapscott's (2009) analysis of the current net-generation (Net Gen) of students showed that due to exposure to technology advancements, today's school-aged children process information differently and more quickly than ever before. Referred to as the Net Gen, this group also desire customization of their learning within a fast-paced environment. For these students, "Speed is normal. Innovation is a part of life" (Tapscott, 2009, p.7). Therefore, educational change in instructional strategies needs to occur in order to meet the needs of this 21st century learner. Tapscott stated that this new generation of student thinks more flexibly and in order to keep them engaged teaching

methods and materials need to be reevaluated and aligned with how student knowledge and skills are acquired. As students' daily social interactions involve interactive media and technology, teachers and schools struggle to take steps to respond to this new expectation. Professional development for teachers must refocus to include innovative methods for integrating technology into the curriculum. Virtual learning communities may be one way to facilitate the growth of technological skills in teachers as they learn to integrate technology in their lessons.

The intent of this qualitative study is to examine how teaching is enhanced through participation in communities of practice, specifically Classroom 2.0 and Flat Connections, and how teachers' beliefs on personal learning and collegial collaboration impact this participation. Teachers participated in learner-directed opportunities while leveraging technology for educational change. Virtual learning groups were used as a venue for personal and professional development to enhance individual learning and transform technological teaching strategies. In their book, Nussbaum-Beach and Ritter-Hall (2012) used the term *connected learning* to describe the power of collaborating and building professional networks within a profession (p. 148). They stated, "connected learning is self-directed, interest-based learning from and with each other, through formal as well as informal activities, from sources outside as well as inside our situated practice" (p. 18-19). Classroom 2.0 and Flat Connections practitioners are encouraged to become co-learners who are self-directed and open-minded. A commitment to engaging in inquiry, exploring new ideas, and continuously reflecting on their work may foster this.

Connected learning communities involve an intersection between three types of communities: personal learning networks (PLN), professional learning communities (PLC), and communities of practice (CoP). Personal learning networks are the online connections a learner makes with others who share both professional and personal interests. Professional learning communities are local teams of teachers working to enhance student achievement by developing their professional knowledge. Communities of practice are groups who have similar concerns and develop a collective group approach to problem solving and developing knowledge.

Nussbaum-Beach and Ritter-Hall (2012) explained that while each of these communities was distinct they all primed teachers for knowledge building within a professional capacity (p. 97). While professional learning communities are organized by teachers seeking to collaborate on topics related to their specific grade level, professional learning networks and communities of practice vary in purpose and focus. Professional learning networks are characterized by individuals who are in search of answers for personal growth and the skills and knowledge they develop is often brought back to their community. Communities of practice differ in that members work in virtual partnerships for collective knowledge building. Through a shared topic of interest systematic improvement is reflected within the community as well within each participant. These three connected learning communities share through face-to-face interactions but the benefits of 21st century presents technologies that encourage virtual exchanges.

Nussbaum-Beach and Ritter-Hall (2012) discussed the idea of *critical friends* as an instructional improvement program. Teachers participated in a cooperative examination of each other's teaching and leadership practices. When utilized in a face-to-face environment, this peer-coaching element allowed teachers to become familiar with each other's classrooms and collaboratively analyze and suggest possible improvements. The feedback assisted in the academic growth of students and improved educator pedagogy. "Visiting each other's classrooms and having others visit theirs helped teachers create an active vision for learning" (Cifuentes et al., 2011, p. 79).

With the need to transform professional development to meet the dynamic needs of the digital learner and 21st century skills, the renewal of professional development must allow for collaboration that improves teaching and learning. Frost, Akmal, and Kingrey (2010) stated that educational change involves a "systematic shift that requires rethinking of old ideas and developing new priorities across the entire educational system" (p. 592). Nussbaum-Beach and Ritter-Hall (2012) consider this shift invaluable because as teachers reframe their beliefs "a new mindset for learning affects what we need to know" (p.14).

The process of school reform through the venue of virtual learning communities may support a culture of unity and purpose. Teachers may feel empowered as they begin to make decisions that influence the personal and professional development process and become active learners in their effort to aptly educate the digital learner. Understanding the liberation teachers feel when they become active in the process of their own

professional growth will guide administrative planners and program developers in crafting a more responsive tool for teacher training. By providing specific teacher feedback, intimate details that were previously unidentified in the field will contribute to more personalized organization of programs.

Technology Integration

"Emerging from the convergence of technology and community is a new role which we call technology stewardship. "The role is important in helping communities construct and live in suitable digital habitats" (Wenger, White, & Smith, 2009, p. 23). The traditional idea of instruction and curriculum design will have to go through a transformation as technology has already begun and will continue to affect schools and learning (Musawi, 2011). This suggests that teacher pedagogy must rise to meet the demanding needs of the 21st century learner. Teaching strategies must allow room for structured events as well as unplanned interactions that increase the potential of instruction that "reflects authentic technological practice" (Slatter & France, 2010, p. 217). In a 21st century classroom, innovative teaching coupled with comprehensively utilized technology is more likely to result in a learning atmosphere that most closely resembles the real-world environments students will be expected to work in (International Society for Technology Education, 2006). Command of the technology and the skills necessary for this to occur may lead to a discovery of teachers' motivations to implement these tools in the classroom. Classrooms must reflect this understanding in order to meet the needs of today's contemporary student groups.

Providing teachers with technology-based tools is not the singular solution for technology integration and learning. Polly, Mims, Shepard, and Inan (2009) stated "there is no guarantee technology will be used effectively" (p.5) even when teachers possess adequate technological knowledge The focus must be on how technology is utilized in the classroom to improve student learning, accelerate the implementation of effective practices, and deliver data for curricular alignment (US DoE, 2010). One of the goals stated for improving teacher learning is that "professional educators will be supported individually and in teams by technology that connects them to data, content, resources, expertise, and learning experiences that can empower and inspire them to provide more effective teaching for all learners" (Atkins et al. 2010, p. 55). This focus emphasized the significance of this research study. Virtual learning communities can transform the face of professional development and by understanding motivations and providing multileveled support; the design and practice of these environments can be crafted to specifically meet teacher needs. Through individual tailoring of personal and professional learning, participant resistance can be reduced making participation a more profound experience. The perspective and skill an educator has with technology, professional development, and allocated time for collaboration and technology-based practices are all areas to focus on when implementing technology tools for instruction.

Musawi (2011) suggested the importance of taking to take into account a social infrastructure when integrating technology into an educational setting. While it is difficult to fully diagnose why a particular piece of technology is used in the classroom or not,

attention must be given to the social context of its use. Participants with varied social cultural backgrounds can have different responses and experiences (Voogt, 2010) interacting with the same piece of technology. He stated that technology should be "used to support learners, and make learning more efficient and the learning experiences more memorable, improve access to ideas and information, enhance and extend an individual's abilities to express themselves" (p. 130). Technology integration can also be enhanced or hindered by culture and context (Sang et al., 2009). In order for full benefits to be realized, the focus of teacher training on the implementation of technology in the classroom must focus on the intersection between pedagogical and andragogical elements. Teachers as learners must comfortably shift their ideas on traditional instructional practices to reflect an understanding of the changing social and educational needs of a new student population**.**

Gaffney (2010) stated that the solutions for teachers embracing the power of technology are multi-faceted. Attention must be given by the top level stakeholders so that educational systems having a shared understanding of the value of the digital venue will develop policies to promote the use of technological tools. Educators in Gaffney's study insisted on the relevance of the digital resources to their work and a supportive culture within the schools to institutionalize their use. Typical concerns such as time and training are common themes in the research in this area. "Basic technology skills and integration of technology into the curriculum go hand-in-hand to form teacher technology literacy and student learning. Encouraging the seamless use of technology in all

curriculum areas and promoting technology is essential in today's 21st Century Classroom" (Arizona K-12 Center, 2012, p. 1). The key to the evolution of teachers integrating technology practices into their instruction is to work systematically towards improvement. The Florida Center for Instructional Technology (2012) created a matrix of 25 cells that illustrated how learning environments and levels of technology integration can intersect. The Technology Integration Matrix (TIM) places levels of technology integration across the top of the chart which represents five levels of technology integration (entry, adoption, adaptation, infusion, and transformation). A vertical list along the left of the matrix represents five learning environments (active, collaborative, constructive, authentic, and goal directed).Teachers can move through the continuum of stages as they develop their skills. Educators can use the TIM exemplary models for effective technology integration. Professional learning that addresses cross-curricular content and technology standards intensifies a teacher's understanding of the value of these new skills. The impact of having these resources and a high level of support at their fingertips may power up instructors' goal of effective classroom technology integration. Recognizing that using technology to enhance teaching involves progression through a multi-leveled system may empower teachers to flexibly restructure their preconceived ideas about learning. This type of professional development can transform learning environments and result in enhanced student educational achievements.

Teacher Beliefs

The process of developing a teacher's technological competence may be impacted by factors other than their experiences with teaching and teaching with computers. An individual's beliefs and attitudes about what constitutes effective teaching and the role of technology within that practice may have a strong influence upon that teacher's educational decisions and classroom practices. Chen and Reimer (2009) stated that the integration of technology into instruction is influenced by teacher beliefs and contextual factors that support them. Their study of three high school Taiwanese teachers explored this relationship and determined that the conversion of technology use from knowledge-transmission tools to methods for fostering students' knowledge construction does not occur without some correlation between beliefs and practice. This evolution underscores the "influence that teachers' beliefs have on the transformation process" (p. 226). This is also established by the research of Kim, Kim, Lee, Spector, and DeMeester (2013). They found that teachers' "belief on learning and their beliefs on effective ways of teaching were related to their technology integration practices" (p.82). This change in beliefs could only occur when teachers openly scrutinized their ideas and contrasted them to alternate beliefs.

Providing teachers with technology-enhanced experiences that promote successful teaching with technology in the classroom is a critical component of assisting them in becoming technologically confident. In a meta-analysis study, Shriner, Clark, Nail, and Schlee (2010) referred to prior research that reinforced the notion that teachers'

confidence in teaching social studies through a technology-supported program was enhanced when certain factors were present. They determined that focused professional development was central to altering teachers' confidence and self-efficacy. Teacher's demonstrated confidence in attempting new practices when they felt the training equipped them with the skills to accomplish specific tasks (Lee & Tsai, 2010), and when resources for their success were readily available. Self-efficacy was more pronounced when the optimism teachers had toward their abilities was transferred to challenging and unfamiliar scenarios. The beliefs the teachers hold regarding their role in delivering effective instruction and the role that technology should play in the instructional setting is directly related to individuals' certainty in their skills. Ertmer and Ottenbreit-Leftwich's (2010) research suggests that "self-efficacy may be more important than skills and knowledge among teachers who implement technology in their classrooms" (p.261). A well-designed learning program that reinforces teacher strengths and promotes positivity may contribute to continued and active participation in virtual learning communities well after the training is completed.

Educators' educational beliefs are strong indicators of their techniques in planning, classroom practices, and instructional decision making. Sang et al. (2009) determined that these beliefs affect curriculum implementation and instructional approaches. Their study of student teachers sought to understand to what extent their thinking processes (teaching-efficacy, computer-efficacy, and pedagogical beliefs) swayed their interest in using technology-rich teaching methods. They found empirical

evidence that high self-efficacy was a reliable predictor of prospective computer use in teaching. Strong computer-efficacy also pointed to their capacity to use technology comfortably in educational settings. Their research demonstrated that personal belief systems exert a powerful influence on teachers' curricular decision-making and instructional practices. A better understanding of these beliefs and motivations may assist in developing tools that meet teachers where they are, while identifying alignment with their educational philosophies that impact classroom technology integration (Sang et al., 2009).

Slatter and France (2010) described teachers' beliefs as falling along a continuum from teacher-initiated learning to student-initiated, teachable moments. They studied 10 secondary technology teachers in New Zealand to determine how their pedagogy influenced their use of resources and expertise found within various communities of practice. Teachers, students, and community of practice representatives worked in partnership to enrich the secondary educational programs. They determined that whoever held the *locus of control* within these interactions had influence over teacher pedagogy. These exchanges were likened to a fluid dance in which the person leading the dance influenced the direction of the learning. As the leadership shifted between participants, each had an opportunity to alter the course of action teachers' could take. The teacher with the locus of control steered the motion and followed familiar conventions of teaching. Here, pedagogy was firmly in place. Representatives aligned their skills with the needs of teachers and students in order to integrate themselves into the learning

experience. Teachers who permitted these connections were open to changing their teaching ideas. Students influenced these interactions by generating authentic questions which necessitated a teacher redirecting the instructional direction. Teachers who were able to shift the locus of control to students were the ones who recognized the value of interaction with communities of practice.

A teacher's willingness to allow others to take the lead in learning demonstrated his or her responsiveness to the change necessary in shifting hard held pedagogical beliefs. At one end of the continuum were learning situations wholly designed and delivered by the teacher. In the middle are representatives from the community of practice while on the other end, students spur the need for open-ended experiences. Laluvein (2010) stated "communities of practice offer members the possibility of changing or adapting their existing frames of reference, assumptions, and theories" (p. 41). Research Question 1 of this study focused on how teaching is enhanced through participation in virtual communities of practice. Interviews and a Ning analysis provided details on how these communities and personalized learning networks provided teachers with the option of reframing their ideologies that resulted in enhanced teaching. These details contributed to new knowledge in the field of educational technology which, once understood, can be extended to other learning groups.

Factors Contributing to Participation

A community of practice's multifaceted platform demands an understanding of the various reasons some professionals feel comfortable participating and learning in this

virtual environment while others do not. The focus of my research was to analyze if the use of virtual learning communities for personal and professional development, specifically Classroom 2.0and Flat Connections, supported continued professional growth through virtual as well as typical learning networks. Baran and Cagiltay (2010) identified possible motivators and barriers in the development of virtual communities of practice environments for teachers' professional development. They classified their findings into three categories: interpersonal, environmental, and personal. The motivating factors related to interpersonal reasons included the rapport between participants that developed and increased through their online activity. In addition, their desire to contribute to the collective group made them feel like part of a community. Personal motivators included gaining more responsibility as a professional, developing self-confidence, and sharing their viewpoints and levels of knowledge. The anonymity of asynchronous communication that digital and virtual technology provided created a comfortable and safe environment. Not having to engage in a face-to-face environment resulted in participants feeling more at ease.

Virtual learning communities can provide flexibility in professional development by eliminating the need to travel and reducing time constraints. While various factors may contribute to a particular community's success or failure, Keown's (2009) research unveiled the fundamental features of effective virtual communities of practice as:

1. A clear purpose and focus of immediate and practical relevance to teachers

2. Diverse community membership and encouraging different roles for participants
3. Strong leadership and facilitation
4. Appropriate use of technology, concept tools, and media
5. Strong community relationships and value
6. An appropriate time frame, pace, and rhythm for the community that allows for evolution, flexibility, and challenge
7. Develop and nurture in-depth dialogue and thinking (p. 296).

Other research supported Keown's (2009) determinations (Baran & Cagiltay, 2010; Chen & Reimer, 2009; Kasi, 2010; & Walker et al., 2011).

Virtual professional learning communities differ from customary models of professional development and the expectations for teachers in terms of participation and execution have evolved to include the effective use technology (Darling-Hammond et al., 2009). In order to develop and maintain these communities, school leadership must provide teachers with extra time for work and collaboration, and they must nurture the environment necessary for its success (Huggins et al., 2011). Essential criteria for job-embedded training include learning that is linked to the practice of teaching (Keung, 2009; Tondeur et al., 2011; Shernoff et al., 2011), communities that foster and encourage confidence in sharing (Hur & Brush, 2009), time for teachers to reframe their beliefs and practices (Maloney & Konza, 2011), and members that value varying perspectives that support in-depth discourse (Frost et al., 2010). These attributes provide a framework for

promoting teacher learning communities that allows for a renovation of current models to represent the needs of the 21st century learner.

The perspective and experience an educator has with technology, professional development, and best practices are all areas to focus attention on when trying to understand challenges teachers face. It is important to determine if these elements contribute to or deter from engagement in virtual communities of practice and implementing technology. Hall and Hord (2011) recognized the anxiety that can be present when a change in practice is required. They discussed the sense of loss of having to stop doing what was a once familiar, doubt about the level of improvement that will take place, and the discomfort that is part of trying something new (p. 13). This information will assist in program planning that develops a platform in which teacher qualms are preempted and the design promotes experiences that effectively supports successful virtual communities.

Educators' willingness to adopt change can be due to positive prior experiences, confidence in teaching, and willingness to guide change (Baker-Doyle & Yoon, 2011). Building confidence through structured programs revealed that teachers felt a positive sense of empowerment at having new expertise. Inan and Lowther (2010) noted that readiness coupled with confidence resulted in higher levels of technology integration in the classroom. Educators' beliefs and values that influence effective technology integration suggests that curriculum reform, in technology or any other field, is more

likely to be successful if we understand how teachers' beliefs influence the implementation of the innovation.

When educators choose to be lifelong learners, they continue to develop the knowledge and skills required to meet the needs of students. Professional development has been the tool by which teachers interact with colleagues within their school or communities to form learning networks. These networks are typically "disconnected from other networks" (Nussbaum-Beach & Ritter-Hall, 2012, p. 27). For continuous learning to occur, teachers should to have the opportunity to collaborate and discuss pedagogy within the context of their work throughout the year. Virtual learning communities allow for teacher learning that is personally driven and not confined to the time and day prescribed by administration. Educators can then guide their scholarship and shift away from a transmission model as they embrace the learning and community model of personal learning and professional development. A model that is "a based on equal participation and emancipation from top-down, expert-driven, training programs" is central for progress (Kasi, 2010, p. 99). Online virtual programs leverage emerging technologies to reveal global communities of inquiry resulting in *connected learning communities* (Nussbaum-Beach & Ritter-Hall, 2012).

Factors Deterring Participation

To successfully support and implement virtual learning communities, a strong need for high-quality, sustained, and job-embedded professional development is required and approaches such as action research, professional learning communities, and critical

friend groups can be utilized (Darling-Hammond et al., 2009). The traditional professional improvement model of isolated workshops or presentations given by outside experts should be replaced with a system that gives teachers greater responsibility and influence over what happens in their buildings. Teacher professional development opportunities need to be relevant and meaningful as they may shape the set of beliefs that form the foundation for their professional views. Berry et al. (2010) advocated that group learning and the self-reflection of beliefs and practices "promotes desirable instructional and pedagogical change" (p. 45).

Darling-Hammond et al. (2009) studied teacher professional development and discovered that typical programs are not intensive enough to efficiently support change in the classroom. Effective professional development should be connected to practice and provide support for teacher collaboration and community building. Varga-Atkins, O'Brien, Burton, Campbell, and Qualter (2010) confirmed this as they noted that most operational professional development includes a focus on the intersection between the integration of new knowledge and its usefulness in the classroom.

Maloney and Konza (2011) found an array of factors that affected professional learning group members from being fully involved in the training and the examination of their beliefs and practices. Confidence was one of the most influencing factors on the conversational interaction between colleagues. Most teachers felt that when differences between philosophies arose, they lacked the self-assurance to voice their ideas or speak to the contrary of the majority of opinions. The circumstances that have teachers often

working in isolation allow them to hold private beliefs which are not regularly challenged. Ertmer et al. (2012) suggested that reflection through journaling and electronic portfolios may allow teachers to challenge their perceptions and contribute to their own professional growth. Also, teachers found little value in professional development that they did not have a hand in developing. The impact of their participation and the potential change it may have had on their instructional practices was lost. Other roadblocks for teachers such as time of day, little time for teacher collaboration, and lack of administrative support also undermined focused participation (Darling-Hammond et al., 2009).

There was a surplus of research that pointed to possible causes for teachers' disinterest or lack of desire to fully engage in traditional or virtual professional development. The literature reviewed was clearly aligned with factors that contributed to the shortcomings of teacher professional development programs (Buckley & DuToit, 2010; Berry et al., 2011; Darling-Hammond et al., 2009; and McCluskey et al., 2011). Shortcomings have influenced the impact training had on changing and improving teacher practice: (a) short term workshops that lack focus; (b) teachers' limited power in decision making; (c) top-down planning that is out of touch with classroom realities; (d) insufficient time for collaboration that supports teaching and learning, (e) failure to address teacher specific needs; and limited time to restructure practices with new learned strategies (Darling-Hammond et al., 2009). These limitations do not provide the support necessary for sustained and intensive professional development that contributes to

increased teaching aptitude. When teachers participate in meaningful professional development that influences their skills, they may adopt new norms of interaction, unlearn old ways of thinking, acquire new knowledge and skills, and learn how to apply these skills in context…[which] can result in the changing of instructional practice (Berry et al., 2010).

Technology enhances the ability to meet the needs of diverse learners, but research has indicated that there are obstacles that stand in the way of full instructional integration (Cifuentes et al., 2011). The strongest and most likely end users of technology are teachers who feel confident in their ability and take leadership roles within the community. This typically included teachers who possessed high content area knowledge and some experience in educational technologies (Baker-Doyle & Yoon, 2011). Howard, Chan, and Caputi (2014) investigated the relationship between subject areas and two known factors of technology integration: teacher readiness and teachers' beliefs. Their research determined that "subject areas *do* matter in technology integration" (p. 8). Wong (2010) stated that the support of a strong community of practice allows teachers to "link content knowledge to a broader social context" (p. 633). His research comparing two communities of practice demonstrated this point. One group continued working closely to enrich their content while participants in the other group slowly disengaged from community and began to fall back into their traditional practices. He determined that constructing knowledge in collaborative communities created joint responsibility and collective accountability in learning. Through engagement in cooperative learning

environments, obstacles were reduced as the success of the community relied on the teams' holistic approach to learning.

Summary

The focus of this study was to investigate how teaching was enhanced through participation in communities of practice and to analyze how teachers' beliefs on personal learning and collaboration impacted this practice. Through a review of the literature, three major themes were revealed: (a) educators sought relevant professional learning, (b) personal significance was preferred, and (c) time was needed for teachers to reframe personal and professional beliefs and practices (Baran & Cagiltay, 2010; Darling-Hammond et al., 2009; Keown, 2009; Keung, 2009; and Maloney & Konza, 2011). Substantial opportunities for professional development are needed regarding technology integration. The advancement of personalized, on-demand, and on-site learning makes teacher learning more accessible and pertinent (Nussbaum-Beach & Ritter-Hall, 2012). The Classroom 2.0 community embodied each of these elements and participation was facilitated by the site developer as well as veteran members. The sustained facilitation within the collaborative groups drew teachers to continue participation and develop networks for personalized learning. This study explored the perceptions of teachers, related to personalized learning and collaboration, to see what impact their beliefs had on their use of Classroom 2.0 and Flat Connections strategies for their on-going personal learning and professional development.

Professional development for educators is most likely to be successful if it meets the needs and motivations of the adult learner (Darling-Hammond et al., 2009). Virtual professional development should seamlessly integrate into teacher practice and "create deeper learning for educators inside and outside of school, connecting educators with the global community and promoting successful implementations of new initiatives designed to improve student success" (Killion, 2013, p. 12). The focus should equip users with resources and reliable high-quality technologies to meet required professional obligations.

Wenger et al. (2009) stated that "communities of practice offer a useful perspective on technology because they are not defined by place or by personal characteristics, but by people's potential to learn together" (p. 11). This literature review examined current research that utilized social learning theory to understand teacher proclivities to learning through technology based approaches. This proposed research established specific factors that influenced continued participation in Classroom 2.0 and Flat Connections environments. Respondents' remarks and interpretations of their experience provided insight into an understanding of the motivations of virtual teacher learning. This contributed to the field of educational technology by highlighting the aspects of virtual professional development that must be enhanced or discontinued for successful future implementation. A review of the methods used to conduct this study appears in Chapter 3.

Chapter 3: Research Method

The purpose of this study was to examine a group of teachers who independently and voluntarily participated in the Classroom 2.0 and Flat Connections networks in order to determine how their beliefs of personal learning and collegial collaboration influenced their engagement in virtual communities of practice. I also addressed ways in which virtual communities of practice and personalized networks for learning developed and enhanced teaching. The social aspect of this paradigm was supported by Wenger's (1998) social learning theory, which is characterized by participant engagement and the informal learning produced by its members within communities of practice. In this chapter, I focus on the research design and rationale for the study, the role of the researcher, research methodology, and issues of reliability and trustworthiness.

Research Design and Rationale

The following research questions formed the basis for this qualitative study.

Research Question 1: How is teaching enhanced through participation in virtual communities of practice and personalized networks of practice?

Research Question 2: How do teachers' beliefs of collegial collaboration influence their engagement in virtual communities of practice?

Research Question 3: How do teachers' beliefs of personal learning influence their engagement in virtual communities of practice?

This qualitative case study (Yin, 2012) was designed to explore the impact of virtual learning communities as a form of personal and professional development for

teachers who interacted in the Classroom 2.0and Flat Connection Ning networked community. It was limited to teachers who participated in these Nings and who responded to a letter of invitation for participation in Classroom 2.0 (Appendix F) or and Flat Connections (Appendix G). The data collected represented *multiple sources of evidence* (Yin, 2012, p. 10) for triangulation of data including the initial phone or Skype interview, archived Ning artifacts, and a follow-up interview with participants. This study included an analysis of the effectiveness of Classroom 2.0 and Flat Connections for nine teachers who signed the consent form (Appendix H) who revealed factors that supported their continued participation within the community. The qualitative data also provided depth and detail to the motivations of participants' behaviors, which offered a unique perspective on virtual communities of practice for learning.

Because of the interpretive nature of the study, a case study approach was selected. Merriam (2009) described qualitative research as an uncovering of meaning in which researchers are "interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences" (p. 5). Similarly, Yin (2009) defined a case study as "an empirical study that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; in which multiple sources of evidence are used" (p. 18). Yin and Merriam suggested collecting data in a natural setting in an attempt to identify and understand participant reactions within a specific event.

This study was bounded by the use of two specific virtual learning environments, Classroom 2.0 and Flat Connections, making it suited for case study research. Through a detailed narrative, the reader is able to recognize the experiences of a person, a group, or a program's life in which they experienced the study's setting and the participants' involvement. The rich descriptions also gave the reader access to the evidence my analysis was based on (Merriam, 2009, p. 258). A case study provided access to situations within the Classroom 2.0and Flat Connections communities that readers would not normally have access to. Therefore, the use of varieties of evidence, such as archived Ning documentation and pre and post interviews, added to the case study's flexibility and strength (Yin, 2009).

Role of the Researcher

The examination and analysis of data from the Classroom 2.0 and Flat Connection networks was from a nonparticipant perspective. All data were collected through telephone interviews with each participant, from archived posts on the Classroom 2.0 and Flat Connections Ning, and through a follow-up interview with participants. An isolation of the phenomenon, exploration of corresponding ideas, and definition of categories facilitated the drawing of conclusions.

Initially, contact was made with the Classroom 2.0 Ning owner and creator, Steve Hargadon, to obtain a signed letter of cooperation giving permission to use the archived data on the Ning and to contact teachers participating in the Ning. The same procedure was used in obtaining authorization from Julie Lindsay to use Ning documents from Flat

Connections. Following institutional review board (IRB) approval, an inquiry message was posted on each Ning with brief information about the research and requesting Classroom 2.0 (Appendix I) and Flat Connections (Appendix J) network members to participate in the study. The participant pool was comprised of those who responded to the invitation, followed by an e-mail from me that provided web links to the Consent Form for Adults. If the initial invitation to participate did not draw enough participants, a second invitation was posted in the Classroom 2.0 Ning community (Appendix K) and the Flat Connections Ning community (Appendix L). After participants were selected, I sent out another e-mail (Appendix M) detailing the study to those who met the conditions for research involvement. The Ning analysis added data that augmented the understanding of how involvement in this online environment enhanced teaching and how teachers' beliefs on personal learning and collegial collaboration influenced their engagement in this community.

Prior to this study I was not a member of Classroom 2.0 or Flat Connections communities, but I became a member in order to access the Ning content. I had previous experience with the methodologies employed within similar virtual communities of practice. A letter of invitation was posted in the community as an invitation for possible participation. The participants in this study were teachers who were contributing members of Classroom 2.0 and Flat Connections and who had been active in the community within the last year. I had not interacted with any of the teachers used in this study and had not had any personal or professional relationships with any of them prior to

this study. When members who I knew volunteered to participate, I did not include them in the participant group. This distance from the participants permitted me to enter this research with no preconceived ideas of responses or outcomes, resulting in fewer biases influencing the findings.

Dwyer and Buckle (2009) classified research on populations in which the researcher shared an experiential base with the study participants as *insider research.* My prior experiences and knowledge of virtual learning communities provided an assumption of shared understanding which facilitated a more comfortable sharing of experiences. My dual role as a researcher and an insider afforded me an understanding of the experience which lent legitimacy to my work. Dwyer and Buckle (2009) stated that being an insider researcher enhances the depth and breadth of the work due to having a shared language with the participants. My prior participation allowed my position as a researcher to be one of camaraderie rather than authority.

According to Karnieli-Miller, Strier, and Pessach (2009), the researcher's ability to establish a "non-structured, informal, anti-authoritative, and nonhierarchical atmosphere" (p. 280) contributes to a more honest and fluid interaction with participants. A welcoming environment communicates a feeling of empathy from the researcher which creates a sense of intimacy among participants, making them more willing to share personal beliefs and stories (Karnieli-Miller et al., 2009). While it was impossible to predict and remove issues of control participants felt towards me, ensuring members' ability to discontinue their participation in the research was communicated. The chances

of breaching ethical standards were reduced by conducting research using teachers with whom I had no background history who responded to the research invitation solicited through a post within the Ning communities. The participants were offered no incentives for participation.

Methodology

Include a topic sentence. A case study is an "empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between the phenomenon and the contest are not clearly evident" (Yin, 2009, p. 18). A case study method was an appropriate means for understanding which factors of the Classroom 2.0 and Flat Connections virtual learning communities encouraged continued practice for professional development. Merriam (2009) posited that an "in-depth description and analysis of a bounded system" will allow for replication of the study (p. 40). Detailed documentation and examination of participant selection, instrumentation, procedures, and data analysis provided the structure for this to occur. I stopped reviewing here due to time constraints. Please go through the rest of your chapter and look for the patterns I pointed out to you. I will now look at Chapter 4.

Participant Selection Logic

Participants in this study were chosen because they were members of Classroom 2.0 or Flat Connections and voluntarily responded to a participation inquiry post which I posted in the community forums. My approved membership within the Classroom 2.0 and Flat Connections networks gave me access to the community so that I was able to identify

teachers whose personal beliefs had been an influencing factor in their engagement in this particular community. Participants were selected using the following criteria: membership in the Classroom 2.0or Flat Connections learning communities, recent participation within Classroom 2.0 or Flat Connections Nings, and accessible contributions within the online environments. The criteria used in the selection process were designed to gather data on the factors which supported continued use of Classroom 2.0 and Flat Connections practices for personal and professional development, and their impact on teaching.

A purposive group of participants were designated. The first criteria for participation included teachers' successful participation within one of the communities of practice. Of the educators that responded to the invitation, a representative group of Classroom 2.0 and Flat Connections participants were selected based on the length of time they had been involved in the community. A follow-up e-mail was sent with information on accessing the consent form for participation in this research study. Purposive sampling was used with each participant because it was centered on "the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned" (Merriam, 2009, p. 77).

Merriam recommended that the sample size be an "adequate number of participants to answer the question posed" in the purpose statement of the research (p. 80). A group of nine teachers who participated in either the Classroom 2.0or Flat Connections communities provided "reasonable coverage of the phenomena" and "increasing the sampling units will not result in new information" (Merriam, 2009, p. 80). The strength of purposive sampling

lay in the fact that the researcher “keeps asking as long as he or she is getting different answers” (Baker & Edwards, 2012, p. 3-4). The array of responses would become redundant with too many participants. In addition, findings can be corroborated with a small group size that offered detailed data that met the saturation level and substantiates a range of replies. The findings substantiated the reasons some teachers found benefits of continued Classroom 2.0or Flat Connections collaborations and how these experiences enhanced their instructional practices.

Instrumentation

Two interviews were conducted with each teacher through telephone conversations or audio conferencing using Skype. Responses to the semi-structured, researcher developed questions were recorded using Audacity Free Recording and Editing and saved as an MP3 for further use during analysis. In the first interview, educators responded to questions about their use of Classroom 2.0 or Flat Connections for personal and teacher learning. After I analyzed the Nings and the first interviews for emerging themes and patterns, a second interview was conducted to clarify any questions and probe for additional information. Both interviews were digitally recorded using Audacity, saved as an MP3 file, burned to a CD, and transcribed verbatim by a professional outside service.

An examination of archived data from the Classroom 2.0and Flat Connections Nings provided relevant information that focused on the patterns and themes that emerged consistently throughout the conversations of the teachers in the Nings. Discussion topics, teacher concerns, and supplemental resources were posted as participants engaged in

dialogue within the Nings. Access to this rich data offered additional understanding of teacher levels of participation, personal beliefs, and attitudes towards collegial collaboration. The use of "multiple measures of evidence essentially provided multiple measures of the same phenomenon" (Yin, p. 117, 2009). These records, coupled with the interview responses, revealed specific, authentic, participant-created data.

Researcher Developed Instruments

Researcher developed instrumentation permitted flexibility in delivery and allowed for a wide range for responses. Through the use of telephone and Skype interviews the results of this study informed the research as it addressed Research Question 1 on how teaching was enhanced through participation in virtual communities of practice and personalized networks of learning. The data from these interviews also spoke to Research Question 2 on teachers' beliefs of collegial collaboration and Research Question 3 on beliefs of personal learning and the influence each had on teacher engagement in virtual communities of practice. All participants were asked the same question which were digitally recorded, saved as an MP3 file, burned to a CD, and transcribed verbatim by the researcher. Table 1 is organized according to each research question.

Table 1:

Research Questions and Interview Questions

Research Question 1: How is teaching enhanced through participation in virtual communities of practice and personalized networks of learning?
• Can you share how your participation in Classroom 2.0 or Flat Connections influenced your teaching?
• Will you describe the ways your personalized learning network helped you in your teaching? These would be the groups you joined within Classroom 2.0 or Flat Connections that were specific to what you wanted to learn, like a math group or foreign language group.
• How did your participation in Classroom 2.0 or Flat Connections community of practice help you learn to integrate technology into your teaching?

Research Question 2: How do teachers' beliefs of collegial collaboration influence their engagement in virtual communities of practice?

- When you're in a typical school situation, can you describe how you usually go about collaborating with your peers?
- How did you use those collaboration techniques to determine how and who you would work with in Classroom 2.0 or Flat Connections? What drew you to the certain people you chose to collaborate with?
- After participating in Classroom 2.0 or Flat Connections have your beliefs on how you collaborate with other teachers changed?

Research Question 3: How do teachers' beliefs of personal learning influence their engagement in virtual communities of practice?

- Before joining Classroom 2.0 or Flat Connections how did you go about learning more about your field and teaching outside of the professional development your school provided?
- Can you describe how your beliefs about your learning influenced the way you approached learning within the Classroom 2.0 community or Flat Connections?
- How has being part of Classroom 2.0 or Flat Connections changed your beliefs about how and where you learn? Were your personal beliefs about learning expanded or challenged while participating in Classroom 2.0 or Flat Connections?

The follow-up questions were designed to clarify specific information, details, and narratives that were evidenced by the Ning entries and to probe responses from the

first interview. The simultaneous coding of raw data captured the themes and patterns that emerged and revealed relevant characteristics that added to the content validity of the findings (Merriam, 2009). A thorough investigation of the comments and entries made by participants on the Nings provided an understanding of teacher beliefs on self-learning. The documentation analysis of the Nings contributed to the overall understanding of the phenomenon.

Procedures for Recruitment, Participation, and Data Collection

The participants for the study consisted of nine certified educators who were engaged in the Classroom 2.0or Flat Connections virtual communities of practice. These included teachers from various educational settings which included parochial, private, and public schools. Data were gathered using sources that included participant responses to two interviews and an analysis of participant interaction in the archived Classroom 2.0 or Flat Connections community Nings. The Ning data were evaluated over a period of 30 days. The initial interview took approximately one hour. The interview data were digitally recorded using a web-based program called Audacity, saved as an MP3 file, burned to a CD, and then transcribed by a transcription agency. The data were evaluated to discover common themes and patterns as related to each research question. Follow-up interviews were held with each participant to probe the original responses. Throughout the research and data collection process all narratives and data were kept on a secure password protected laptop. Data were stored on a personally owned USB drive for a period of 5 years following the end of the study. The USB drive was kept in a locked

filing cabinet in my home. After 5 years, the data will be erased from the USB drive and the USB drive will be destroyed.

At the end of the initial interview participants were reminded of their agreement to participate in a shorter follow-up interview. A date and time for the second interview was determined. When all interviews were completed the participants were sent a thank you message via e-mail. After the interview responses were transcribed and initial findings were isolated, the interpretations were shared with participants for member checks. This was an invaluable way of ruling out the possibility of misinterpreting participant responses (Merriam, 2009). Member checks were also conducted throughout the course of the study.

Data Analysis Plan

Merriam stated that “data collection and analysis is a simultaneous activity in qualitative research. Analysis begins with the first interview, the first observation, the first document read” (2009, p. 165). Data for this study were collected from a purposive sampling of individuals and manually sorted in response to the three research questions. Data relating to enhanced teaching in Research Question 1 were coded and organized for meaning. This coding was also used to make inferences from the first participant interview and the follow-up interview. The same process was used to manage data collected pertaining to Research Question 2 on personal beliefs on collaboration and Research Question 3 on beliefs on personal learning and both of their influence on engagement in

virtual communities of practice. The data mined from analysis of the Nings were also coded and used as supporting evidence when drawing conclusions.

Throughout the research process, researcher journaling enabled the writing of comments and memos that occurred during the data collection process. These notes provided useful information that helped substantiate the data. The use of a research journal allowed the researcher to "keep track of thoughts, musings, speculations, and hunches as you prepare your data for analysis" (Merriam, 2009, p. 174). A focused exploration of organized data supported a smoother, more efficient analysis process.

The data were hand coded for the organization and facilitation of data analysis. Transcribed interviews, coded documents, and audio were all associated and triangulated for internal validity. Hand coding allowed data to be examined and thoroughly reviewed by the researcher for an in-depth understanding. The ability to organize text and data into meaningful coded groups and easily locatable segments supported a more accurate investigation.

In order to maintain confidence in research, the analysis of information identified "data that support alternate explanations" (Merriam, 2009, p. 219). Rich sampling of alternative explanations of the phenomena challenged preconceived ideas about possible conclusions and increased legitimacy of the findings. "By identifying the most plausible rivals and collecting data to determine if the rivals can be rejected, a case study can reach an acceptable degree of certainty about its conclusions" (Yin, 2012, p. 118). The analysis of data involved "moving back and forth between concrete bits of data and abstract

concepts, between inductive and deductive reasoning, between description and interpretation" (Merriam, 2009, p. 176). Interpretation of the data from this qualitative study served to clarify how beliefs of personal learning and collegial collaboration influenced continued engagement in this community of practice and revealed how personalized learning networks enhanced teaching.

Issues of Trustworthiness

Qualitative studies involve researchers making observations of people's behaviors and interactions. Different researchers working in the same environment may witness different events. This "makes it imperative that researchers and others have confidence in the conduct of the investigation and in the results of any particular study" (Merriam, 2009, p. 210). In order to establish trustworthiness of qualitative research, credibility, dependability, transferability, and confirmability needs to be established. The standards for rigor in qualitative research must be consistent since there are a variety of approaches and methods to collecting data (Merriam, 2009). The following section identified the criteria that make qualitative research valid and reliable.

Credibility

Qualitative research exists as a "multi-dimensional and ever-changing" body of information that bears inquiry. Merriam (2009) described internal validity as how well research findings match reality. While complete objectivity in research is difficult, there are strategies that increase credibility such as triangulation. The ability to review findings through multiple lenses provided a more rigorous examination of data that increased the

likelihood of a more comprehensive conclusion. Using multiple sources of data and member checks were two methods for corroborating the findings of a case study. Comparing and cross-analyzing data as well as checking for accuracy by reviewing researcher analysis with participants ensured internal validity. Triangulation involved “using multiple investigators, multiple sources of data or multiple methods to confirm the emerging findings" (Merriam, 2009, p. 215).

Data were triangulated using a case study approach of the two Skype interviews and archived Ning data. Two Skype interviews were used to gather data from participants who provided evidence on teacher beliefs of personal learning and collegial collaboration, and a description of how the personalization of learning networks created within Classroom 2.0or Flat Connections enhanced their classroom practices. Archived Ning data helped develop a greater understanding of learning community from various perspectives. The sharing and interaction that occurred via the Ning informed their level of learning and change in instructional practices. Examining participant's archived online interactions clarified the social context which influenced their participation in the learning community.

Transferability

Merriam (2009) defined transferability as the “extent to which the findings of one study can be applied to other situations…and the people in those situations” (p. 223). The capacity to generalize findings was enhanced through rich, thick descriptions that provided details about the setting, participants, and evidence of the results supported by

quotes and field notes from the research. Maximum variation enhanced transferability by providing multiple and varied participant interactions resulting in a wider range of transferability (Merriam, 2009, p. 228).

Dependability

Qualitative research seeks to explain the world as those in the world experience it. This can be difficult to replicate since there can be multiple interpretations of a single event. Dependability refers to the degree to which findings are reliable and can be replicated (Merriam, 2009). An outside researcher should be able to consider the data presented and concur that the conclusions make sense. The results therefore are dependable.

Two techniques outlined by Merriam (2009) were used in this study to ensure that "the results are consistent with the data collected" (p. 221). The first technique, triangulation, was achieved by using two methods of data collection and analysis which included two teacher interviews and archived Ning records. The convergence of evidence from multiple studies reinforced the finding of the study (Yin, 2009).

The second method, an audit trail, provided a detailed explanation of how data were collected, the methods applied, and rationales that authenticated the findings of the study. The use of an audit trail provided a clearer representation of how the researcher arrived at his or her findings. The use of these tools enhanced the rigor and trustworthiness of the study thus ensuring validity. Dependability in research places the

onus in the investigator as the abundant, expressive data presented makes transferability a reasonable possibility (Merriam, 2009).

Confirmability

As further verification of the trustworthiness of research, confirmability can serve to substantiate findings. Wahyuni (2012) stated that confirmability "refers to the extent to which others can confirm the findings in order to ensure that the results reflect the understandings and experiences from observed participants, rather than the researcher's own preferences" (p. 77). The researcher must preserve the data so that a reader of the research would be able to examine the data to confirm the results. This can be accomplished through an audit trail which "describes in detail how data were collected, how categories were derived, and how decisions were made throughout the inquiry" (Merriam, 2009, p. 223). A research journal can be used to note any issues that present themselves during the research. Merriam (2009) added that through reflexivity researchers must maintain objectivity in research. This included not influencing the environment being studied which ultimately affects the situation being observed. Through clear articulation of researchers' assumptions and experiences a reader will "better understand how the individual researcher might have arrived at a particular interpretation of the data" (Merriam, 2009, p. 219).

Ethical Procedures

This study required Internal Review Board (IRB) approval from Walden University. Access to participants was gained after the Ning owner had signed the letter

of cooperation and the Walden IRB approved the research# 02-28-14-0047910.Stakeholders in the archival data contained in the Ning were protected as stated in the Consent Form. Participant consent forms were made available prior to conducting the interviews. The consent forms provided a description of the research study, the anticipated expectations of the participants, and an emphasis on the confidentiality of the participants. All participants were voluntary adults. They were aware that they had the right to withdraw from the study at any time. Ethical considerations for the participants' time responding to the interview questions were taken into consideration and the time required for the two interviews yielded rich information to inform the research questions.

Member checks were conducted to allow participants the opportunity to examine the data and interpretations of their interviews to determine if the analyses of the data were reasonable. They were given opportunities to read their transcripts and verify the information and offer comments and clarification. Participants had the right and opportunity to discontinue their involvement in checking the data. The accuracy and objectivity of this qualitative research was intentionally planned to ensure reliability. All results were kept confidential and used solely for the intended research study. All data collected were securely stored and protected. The researcher adhered to all internal review board regulations at every stage of the study which was aligned with the ethics of research.

Summary

The relationship between teachers' beliefs of personal learning and collegial collaboration and their influence in engagement within virtual communities of practice was examined. The researcher determined the factors that encouraged continued engagement in networked learning groups and participation in virtual communities of practice. Through a careful analysis of the how teachers' beliefs influenced sustained involvement and use of personalized learning networks, a better understanding of how to accommodate the learning needs of teachers' personal and professional development emerged.

Empirical data were collected using two interviews and archived data, as nine educators' contributions enlightened readers of the phenomenon of social learning and personalized virtual professional development. Criterion of preserving trustworthiness in research was pragmatically applied while using researcher-developed instrumentation to thoroughly examine data. The triangulation format of this research study allowed the researcher to collect and examine three sets of data to form themes. A cross-checking of the data to compare results provided "converging lines of inquiry" from which data can be corroborated (Merriam, 2009, p. 116). This allowed for a more in-depth analysis of the data collected, thus drawing stronger and more robust conclusions.

This research contributed to the knowledge and literature in the field of teachers' beliefs and practices in virtual communities of practice for personal and professional learning. The implications of this study crossed several domains benefitting educational

administrators, K-12 teachers, educational trainers, and professional development organizers. Understanding connections between personal beliefs on learning and use of virtual communities of practice was utilized to restructure current models of virtual learning that resulted in enhanced teaching. Implications resulted in the development of programs that connected personal learning styles and beliefs with professional development.

In Chapter 4, rich themes and patterns from this data are reported. Chapter 4 includes the research setting, demographics, data collection, data analysis, and findings. It provides evidence of trustworthiness, outlines results, and responds to each of the three research questions.

Chapter 4: Results

The purpose of this qualitative case study was to examine how teaching was enhanced through participation in communities of practice and to analyze how teachers' beliefs on personal learning and collegial collaboration impacted this participation. I investigated how personal or professional pedagogy contributed to collaborative strategies within virtual learning communities. I also focused on the personal philosophies of teachers to see if they had an influence on learning and productive participation in virtual learning communities.

In Research Question 1, I queried teachers about their engagement within Classroom 2.0 or Flat Connections and asked how teaching was enhanced through participation in virtual communities of practice and personalized networks of learning. In Research Question 2, I examined personal pedagogy on collaboration and queried how teachers' beliefs on collegial collaboration influenced their engagement in virtual communities of practice. In Research Question 3, I further probed personal beliefs on learning and its influence on participation in learning communities and asked how teachers' beliefs of personal learning influenced their engagement in virtual communities of practice.

Chapter 4 includes the setting, participant demographic information, and data collection methods. I then provide an analysis of the data which substantiated the research trustworthiness. Research findings are ordered under the three research questions focused on teacher participation within either Classroom 2.0 or Flat

Connections. The open-ended inquiries outlined themes concerning the influence personalized learning networks had on their technology use, as well as teachers' personal views on learning and collaboration within either of these two virtual communities.

Setting

The setting for this research took place in the digital world through the conversations I had with participants via Skype and Google Hangouts, as well as through the contributions participants made to their community Ning. Because the interviews were conducted at a distance, the teachers participated from their own locales. Abby, Beth, Toni, and Hope's interviews were conducted at times when they were at home. Beth had connectivity issues and switched locations within her house. She indicated she had moved to the laundry room in order to hear more clearly. Carla's interview was held at the end of her school day, while Felix made time during his 50-minute planning period to participate. Due to limited connectivity, Iris's isolated home location was not conducive to online discourse, thus dictating that we schedule her interview at a time when she was in her school building. Diana contributed to the initial interview from her home, while her follow-up interview was held from her hotel room while she attended the ISTE conference in Atlanta. Grace attributed her difficulty committing to a time to be interviewed due to her hectic schedule and so both interviews were conducted while she was in her car.

One participant suggested using Google Hangouts for data collection which was then used. The teacher in Australia had limited connectivity from her rural home and felt

confident that she could Skype from school due to the better bandwidth. The 16-hour time difference between the eastern United States (my physical location) and the eastern part of Australia (the participant's location) had to be negotiated in order to schedule a synchronous interview. The most effective way of conducting the interviews was to simplify the steps and keep the call within the time range they expected.

According to Wenger et al. (2009), a digital footprint is the trace a person leaves behind each time he or she does something on the web. This includes discussions, pictures, and blog posts. The digital footprint each participant left behind through their interactions, as found on the Classroom 2.0 or the Flat Connections Nings, was the second setting for this research. Nings are websites that permit users to create their own social or professional network. Interest groups form and are typically related to an educational topic (Schreck, 2009). Members of these two communities participated in the discourse within their Ning and often found similarly minded colleagues with whom to collaborate and learn.

In this study, I focused on the rich teacher narratives collected through the initial interview process, the follow-up interviews, and the examination of digital Ning data. The themes that surfaced reflected the personal perspectives of the teachers' experiences within these virtual environments as influenced by their individual educational viewpoints related to learning.

Demographics

The interviews were conducted with eight teachers who resided within the United States and one teacher who lived in Australia. Pseudonyms were assigned to the participants in order to maintain their privacy: Abby, Beth, Carla, Diana, Eliza, Felix, Grace, Hope, and Iris. Their teaching experiences ranged from 4-35 years in elementary through high school settings, and eight out of nine teachers had earned a master's degree. All of the teachers had between 2 and 6 years of participation in the Classroom 2.0 or Flat Connections virtual community. The schools represented in this study included public, parochial, international baccalaureate, technical academy, low socioeconomic, and an isolated community of learners in rural Australia.

At the time of this research, all participants (Table 2) were K-12 teachers. They had all used technology as a tool in their classrooms and contributed to either Classroom 2.0 or Flat Connections communities of practice and engaged in personalized learning networks of practice at varying levels. These teachers were considered technology leaders in their schools. Some provided professional development to colleagues, while others worked and supported small teacher groups.

Table 2.

Participant Demographics

Teacher	Gender	Age	Level of Education	Years Experience	Subject Grade	Years using 2.0/FC
Abby	F	43	Masters	21	Computer Tech 6th-8th	4
Beth	F	48	Masters	13	English 10th - 12th	1
Carla	F	45	Masters	6	Elementary 5th	1
Diana	F	42	Masters	15	Social Studies 9th	4
Eliza	F	44	Masters	17	Elementary K-5th	3
Felix	M	58	2 Masters	35	Computer Sci. 9th-12th	5
Grace	F	50	Masters	6	Library/Tech 9th-12th	3
Hope	F	56	Masters	25	Tech Specialist 5th-8th	5
Iris	F	62	Bachelors	27	Technology 1st-12th	4

Data Collection

The data collected represented multiple sources of evidence (Merriam, 2009, p. 10) that was triangulated from the initial Skype interview, archived Ning artifacts, and a follow-up interview with participants. This study included an analysis of the effectiveness of Classroom 2.0 or Flat Connections for nine teachers. Each teacher signed a consent

form stating they were willing to be interviewed about factors that supported their beliefs on self-learning, collaboration, and participation within a virtual community.

Interviews

Semi structured interviews were conducted with each participant via Skype or Google Hangouts. In Research Question 1 (Appendix A), I focused on teachers' beliefs on how they learned and how collaboration influenced their engagement in Classroom 2.0 or Flat Connections Project virtual communities. I determined whether the use of networks of learning, which were personalized according to teacher need, enhanced their teaching and use of technology in their classrooms.

The influence teachers' beliefs had on their engagement within communities of practice was the focus of Research Question 2 (Appendix A). Inquiries were made to gauge the difference between teachers' typical collaborative methods and their collaborative actions in virtual communities. Post participation questions were used to determine if participants' ideas on collaborative engagement had changed from their original beliefs.

Research Question 3 (Appendix A) directed the investigation of teachers' theories on personal learning and their influence on engagement in the communities of practice. The queries permitted an exploration of teachers' immersion in virtual communities of practice and an assessment of the reformation of teachers' pedagogical views. Educators were questioned about their acquisition of knowledge and were encouraged to reflect on and highlight various aspects of their engagement within virtual communities of practice.

The researcher conducted these interviews from her home office while teachers were at their home, school, car, or conference when responding. Each participant took part in one initial interview, which lasted between 45 and 60 minutes. The data were recorded using Audacity Free Audio Recorder and Editor. Audacity offered a streamlined process for recording Skype calls. There were no steps required by the participant. This simplified the interviewing and recording process.

The questions were the same for every participant and probing from the researcher revealed valuable information that contributed to the research. The initial interview provided the main source of data and the second interview, along with member checking, enhanced the themes and patterns and provided additional evidence that supported post data analysis.

The process of finding qualified participants for the study took longer than anticipated. The Classroom 2.0 Ning announcement (Appendix I) was posted three months. The information on this Ning included my professional information and a link to the letter of invitation. During that time, I created a personal page in Classroom 2.0, joined various related communities within the Ning, and sent scheduled Tweets on Twitter. In addition, I contacted virtual colleagues who had large Twitter followings to Tweet a call for participation using my model. Despite these efforts, I was not able to acquire 8-10 participants as expected and thus, had to broaden my community search parameters.

My request to expand the virtual communities to include the Flat Connections community and its Ning was approved by IRB. A newly created announcement for the study was placed on the Flat Connections Ning (Appendix J) for about two months. I created a personal page with a professional profile, contact information, and the announcement that included a link to the letter of invitation (Appendix G).

The interviews were audio recorded using Audacity Free Audio Recorder and Editor. They were played back and transcribed by the researcher. The extended time it took to secure the first participants provided the researcher ample time to analyze findings and code data samples by hand. Files were kept secure on my password protected personal laptop. The interviews were conducted April through July 2014 and all records and data analyses were kept in my home office on a password protected laptop.

Digital Media

Digital data mining allowed raw data to be turned into useful information and was used to extract data from each participant's contributions to their community Ning. Along with the data from the interviews, this information was examined for themes and patterns. An evaluation of the Ning data yielded strong examples of teacher beliefs about their learning within virtual communities of practice. A comparison between the Ning data and the interview responses revealed common themes. Evidence from both data sources was coded and is discussed in the Data Analysis section.

There were no unusual circumstances encountered during data collection. The time that lapsed in getting the first few participants and reaching out to another virtual

community for more participants, allowed me to conduct initial interviews and transcribe them by hand. This unexpected circumstance permitted time to refine my questioning skills for the subsequent interviews. The interviews took more time than anticipated to schedule due to teachers' end of the year schedules. Multiple e-mails were sent to teachers who initially consented to participation via e-mail but who did not follow through with the interview. All interviews were successfully recorded during the initial attempt.

Data Analysis

The data analysis process "involves the simultaneous coding of raw data and the construction of categories that capture relevant characteristics of the documents content" (Merriam, 2009, p. 205). Throughout the collection process attention was given to the data that provided a deeper understanding of particular issues related to the active participation of teacher learners. An organization of data disclosed information regarding personal ideologies on learning and the use of technology.

Manual Coding

Manual coding was used to identify parallels in the raw data. This initial data review facilitated a "period of intensive analysis as tentative findings are substantiated, revised, and reconfigured" (Merriam, 2009, p. 178). After the interviews were transcribed, open coding was performed on the data and relevant categories emerged. Data were organized by segments (quotations), strings, phrases, and expressions for each of the nine interviews. Recurring participant words were noted as were concepts brought

forward, such as social learning and collaboration, which corresponded to the study's research questions. The use of "pragmatic transcription," researcher devised format which produces a verbatim text, provided the researcher a tailored approach in which the organization of the data had meaning to the researcher (Evers, 2011). Next, the use of software that supports visual diagraming called Lucid Chart Diagrams enabled the creation of flow charts of the major categories, subthemes, and watchwords (Figures 2, 3, 4). Finally, the patterns that emerged were then correlated back to the three main research questions (Figure 1).

Figure 1 provides a visual depiction of the major categories that surfaced through data analysis. Figures 2, 3, and 4 represent the category developed from each research question, expanded to show coding analysis.

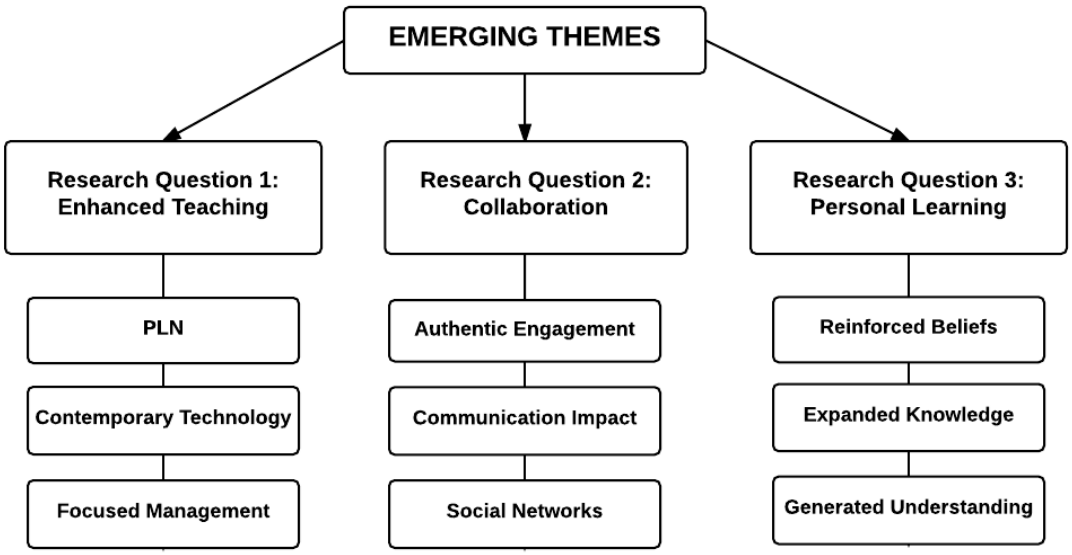


Figure 1: Main research questions and emerging themes.

Merriam (2009) held that all "qualitative data analysis is content analysis in that it is the content of interviews, notes, and documents that is being analyzed" (p. 205). I engaged in a multifaceted examination of the data derived from open-ended interviews and digital records collected from participants' activities from the Nings. Through data analysis, responses were grouped by categories around each research question. The three categories were personal learning networks, technology tools, and task restructure. This raw data assessment proved to be important as it reflected the experiences of the participants in the learning process (Merriam, 2009).

According to Roth (2013) transcription is translation. As qualitative researchers make meaning of data collected, they "represent the lives of others" (p. 18). Analysis of empirical data involves breaking down participant narratives into the language of the researcher. Wenger's social theory of learning emphasized the method of collective engagement within virtual learning communities like Classroom 2.0 and Flat Connection. These communities are created over time by the sustained pursuit of a shared initiative (Wenger, 1998, p. 45). An outcome of continued participation is teachers' groups that are characterized by the personal, social accounts of their activities within their community of practice.

Discrepant Cases

A discrepancy was revealed between the beliefs and practices of one of the nine teachers. Participants had comparable beliefs on the use of Nings as a basis for their collaborative and global pedagogy. Technology appeared to be paramount in their

practice and each was engaged in either Classroom 2.0 or Flat Connections. While teachers were consciously motivated by their interest in augmenting work in their field of practice, one teacher's comments was incongruous to the others. Even though Grace, a library and technology teacher in a small parochial school, was briefly introduced to virtual learning communities and participated in Classroom 2.0, her understanding of the goals of this collaborative environment did not appear clear. "If I got the answer or idea I would go ahead and do it myself in my own school and I wouldn't necessarily collaborate within Classroom 2.0." When paralleled with a teacher who also had 6 years of experience, the incongruities become clear as Carla recognized that her beliefs had changed drastically since her participation in Classroom 2.0 and she stated that "learning doesn't just happen in the classroom. You can learn from people who are not in your classroom." While analysis of this deviant case appears to contradict the patterns that have emerged from this research, the discrepancy can be attributed to Grace's misrepresentation of the purpose of virtual learning communities. Her interpretation of these learning communities did not affect the validity or transferability of the study.

Evidence of Trustworthiness

Credibility

The ability to review findings through multiple lenses provided a more rigorous examination of data that increased the likelihood of a more comprehensive conclusion. The use of multiple sources of data and member checks were two methods for corroborating the findings of my case study. Interviews allowed for an informal dialogue

between the research and participant leading to a smooth transition into the focused interview questions. Triangulation of digital records, interview data, researcher notes, and members check provided a saturation of the research documentation that began to show limited differences in participant responses. Comparing and cross analyzing data as well as member checks for accuracy decreases the chances of researcher bias entering the analysis and increases the study's credibility (Merriam, 2009).

Transferability

The capacity to generalize findings was enhanced through the depth of the descriptions about the setting, participants, and evidence of the results, which were supported by quotes and researcher notes from the research. Teachers from two virtual communities of practice were studied. The size sample of nine provided enough variance and perspective that it could contribute an enriched understanding of the influence personal beliefs might have on learning in comparable communities. The use of sufficient descriptive data and multiple and varied participant interactions results in a wider range of transferability (Merriam, 2009).

Dependability

According to Yin (2009) case study dependability increases when the researcher "makes as many steps operational as possible and to conduct research as if someone were always looking over your shoulder" (p. 45). The multiple techniques used for data analysis increased the dependability of the study. The transcription of the audio recorded interviews provided an opportunity for the researcher to develop an intimate

understanding of the data. The reiteration of conducting multiple interviews and transcribing data by hand allowed for a more complete evaluation of the data. An outside researcher should be able to consider the data presented and concur that the conclusions make sense. The results therefore are dependable.

Confirmability

Wahyuni (2012) stated that confirmability refers to "the extent to which others can confirm the findings in order to ensure that the results reflect the understandings and experiences from observed participants, rather than the researcher's own preferences" (p. 77). The individual teacher interviews provided for elaborations on personal beliefs and instructional behaviors within the virtual environments in which they participated. Researcher journaling fortified the audit trail providing notes that could be used as reference. The use of verbatim quotes from the interviews supported the themes found in the digital data, which clearly linked the data with the analysis thus increasing the level of confirmability.

Results by Research Questions

Research Question 1: Enhanced Teaching

RQ 1 framed the use of technology through the learning and participation in virtual learning communities. It was stated as follows: *How is teaching enhanced through participation in communities of practice and personalized learning networks?* RQ1 was supported by three open ended sub-questions in the semi-structured hour long interview:

1. Can you share how your participation in Classroom 2.0 or Flat Connections communities influenced your teaching?
2. Will you describe how your personalized learning network helped you in your teaching?
3. How did your participation in Classroom 2.0 or Flat Connections communities of practice help you learn to integrate technology into your teaching?

During the data analysis three broad categories emerged: personal learning networks (PLN), technology tools, and focused management. Under each of these broad categories, I identified specific themes and patterns.

Participants from both communities of practice, comprised of both beginning and veteran teachers, engaged in technology based opportunities made possible by membership in either Classroom 2.0 or Flat Connections virtual classrooms. Rich online connections enabled teachers to share professional knowledge and engage in interactions that enhanced their practice. Bingham and Conner (2010) wrote that networks "provide people at every level, in every nook of the organization, and every corner of the globe, a way to reclaim their natural capacity to learn non-stop" (p. 6). Each category is expanded model themes related to enhanced teaching.

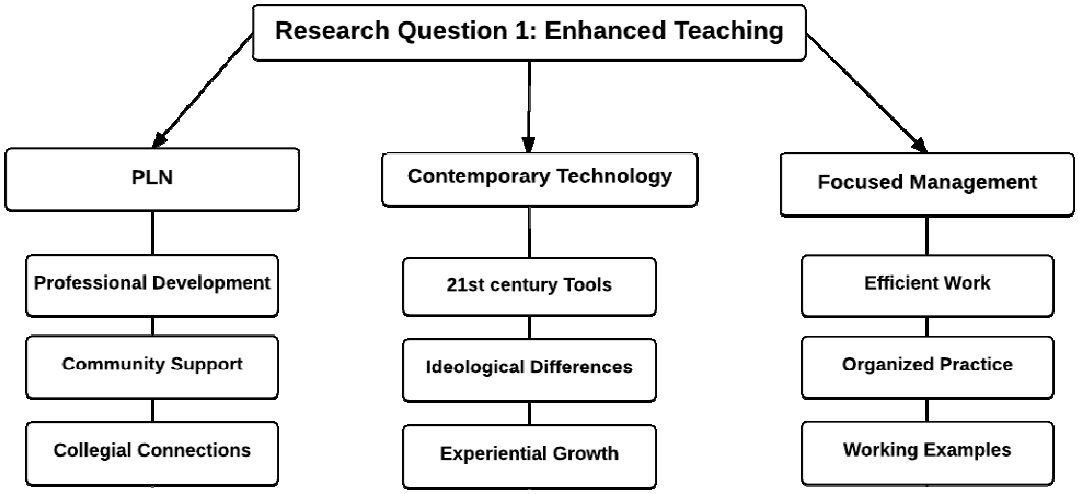


*Figure 2:*Enhanced Teaching category mind map.

Analysis revealed three broad categories that gave way to themes under each topic. For this study, *PLN* will represented the professional groups and learning approaches self-selected and initiated by educators that further their goals for personal learning and professional growth. This will include connections made with local and global colleagues. The term *contemporary technology* signified the implements used accomplishing a task especially involving technical processes. In this study, these tools are characterized by their function of providing access to resources and 21st century methodologies. Examples include Nings, wikis, and Skype. *Focused management* referred to the processes used in making teacher tasks streamlined and more effective.

Interview and Ning data revealed that the most effective communities were those whose members were willing to fully participate by communicating and sharing within their groups. Wenger et al. (2009) defined the term participation as “the social experience

of living in the world in terms of membership in social communities and active involvement in social enterprises" (p. 55-56). Research Question 1 investigated the power of personal learning networks (PLNs) in order to identify the influence it had on teaching.

PLNs: Professional Development, Community Support, and Collegial Connections

The educators in this study maximized their experiences by engaging in the participatory structure of online learning networks. Their willingness to learn and contribute within these environments augmented their teaching by exposing them to the global collaborative immersions they took back to their students. A revitalization of philosophical pedagogies took place as teachers found value in the unlimited potential for collegial collaboration. The three categories revealed relating to Research Question 1 were professional development, community support, and collegial connections. Teacher experiences emphasized the essential role professional development played in instructional practice and reframing previously held beliefs. Cooperative teacher support and the promising professional connections made possible through the deliberate organization of PLNs and communities of practice, points to Wenger's premise that through the "process of communal involvement" the most meaningful learning and knowledge development can occur (2002). Through engagement in virtual learning communities, collective experiences may lead in the recognition of technology's capacity to stimulate progressive instructional practices that are aligned to the learning skills necessary for the future.

Professional development. The data collected revealed trends particular to teacher methodologies on improving practice as some teachers reported hearing new ideas and using tools they were not familiar with. Learning systems made available through access to technology has restructured and contributed to a more self-directed learning style. Many stated that district driven professional development had become a thing of the past. Teachers have become self-guided learners expressing their need for growth as finding others with similar "passion or interests." The more "passionate people feel about those concerns, the more drive the community is likely to have" (Wenger et al., 2002, p 71). Participants conveyed that the use of technology and access to online local and global interest groups afforded them the chance to engage in a more systematic learning process. Iris described this social engagement as beneficial because it allowed her to take more risks knowing that there was always someone out there to support her.

Teachers' expressed that their role in the exploration for professional knowledge was transformed through their involvement in PLNs within virtual communities. Eliza, a teacher who taught at an International Baccalaureate school, felt that a substantial factor in this transformation was involvement in her PLN. She stated,

> I am the only person in my building that does this job so I don't have a team. It gets kind of lonely but I am part of a personal learning network that I really enjoy. We meet online once a month, I believe there are about five or six of us, and we're interested in the same thing. So, we're doing book studies with the students

> online and we do some blogging with them. All of our ideas are very similar so we keep in contact and think of other ideas to do with each other.

The strength of a community of learners can often provide richer personalized learning compared to traditional methods of professional development where prescribed content is delivered while teachers' sit and listen. Eliza confirmed this as she described one of her learning scenarios.

> Usually the (professional development) classes were just set up and they would just train us. It was very structured and there were no options it was just 'this is how you going to do it' and 'here are your choices.' Now, because of Flat Connections, I have a global network and a PLN. If I have a question about something I go to a Skype group that I'm in and ask "Does anybody have or know how to use a mobile iPad because we are having this issue? Has anyone else had the same issue?" So, that's not always considered professional development but I get a lot of that from just being in these Flat Connection projects with people.

Carla was considered a master teacher whose teaching strengths were recognized as superior. This recognition earned her the credential of master teacher. She remarked on a characteristic of this learning network. She stated "this is some of the best professional development I've ever experienced and it really pushed me to go into areas I never would have pursued or thought of pursuing until I became part of this network." Carla made these comments after having been a participant Classroom 2.0 for one year.

PLNs, as defined by Richardson et al. (2011), are the "rich set of connections each of us can make to people in both our online and offline worlds who can help us with our learning pursuits" (p. 21). Iris's practices in Australia mirrored those of other local participants. She strongly verbalized her ideas about the potential for advancement participants had at their disposal through their engagement in PLNs. She shared:

> The combined talents within a virtual community give us specialized professional development. Our meetings contribute to our personal knowledge so we are not only PD'g (professionally developing) on pedagogy but on the backgrounds to the ways we teach and learn.

When asked about the camaraderie in her group, Abby described the support and significance of working within in her PLN. She shared:

> As a benefit, I connected with a few educators to expand my PLN and incorporated some fun, engaging projects for my students to participate in. The 4th graders worked on the Crazy Crazes project in the fall and Mardi Gras project in the spring with the students of the educators I met in course. Although the project was a challenge and I didn't complete the entire course, I learned how important being a connected educator can be for my students and myself.

Wenger et al. (2002) stated that teacher training that is embedded within "communities of practice create value by connecting the personal development and professional identities of practitioners to the strategy of the organization" (Wenger et al., 2002, p. 16). These accounts on the use of learning networks and communities of practice for teacher

development speak to the need for contemporary practices reflecting the current state of education. This informed Research Question 1which indicated that programs developed for professional learning delivered through virtual communities can influence teachers and their instructional practice.

Community support. Cooperative teams provide a sense of intimacy and well-being. The livelihood of the group depends on the sustained interactions between members (Wenger et al., 2002). Even Felix, a teacher with 35 years of classroom experience, used this quotation "the student (now) becomes the master" to epitomize how his experience in Flat Connections equipped him with the necessary knowledge and skills to support his interactions with other members of the community.

> There were a lot of things going on, so many different things you had to figure out. But, by asking for help from the group, hunting through things, reading, and watching those who know what they're doing; now I'm in the position of helping people who are confused about how to do things or keep students on task.

The crux of this collaborative environment and its certain survival is the support colleagues give each other. Iris stated it simply when she verbalized,

> It is difficult to reform teaching practice without the support of others but this support enables us to change teaching practices almost immediately. I was able to take greater risks with my students as I knew there was full support out there from others. Someone always shared how different uses of technology could support the project and if we didn't know we explored and learned together globally.

Cooperative practice is the mainstay of functioning and learning within virtual learning communities. As members identify the benefits of participatory practices, they feel empowered to bestow that support onto other members of the community. Personalized networks provide the familiarity necessary for sharing ineffective efforts as well as successful practices. On-going discourse illuminates the root of Research Question 1 which acknowledged that through these networks enhanced instructional practices can flourish.

Collegial connections Communities of practice offer a useful perspective on technology because they are not defined by place or personal characteristics, but by peoples' potential to learn together (Wenger et al., 2002, p. 11). After full participation in Classroom 2.0 Beth, a high school English teacher, quickly recognized how her PLN connections could help her both professionally and personally. She stated:

> As I am putting together my capstone that's when I realized there is a lot of information out there; some great, some not so good, but if you know where the solid information is, that's good. I know it can be found in places like in Classroom 2.0. I'm also a member of the English Ning, and just knowing that there is somebody out there, that there is a community out there, a network out there that can be your support, is really nice. I am always looking for ideas for flipped classrooms and I am also a member of the flipped classroom network. Just knowing there is something out there and you don't have to go search on the

> Internet, instead you go to your PLN for support. You throw the question out there and someone is going to answer you. That is very helpful.

Felix, a veteran teacher, reflected on his participation in Flat Connections and was immediately drawn back to his early experiences. He recalled how seasoned members were always accessible and willing to connect with him to ensure he had a maximized experience. Now, he was motivated to support new members. He said:

> I am a pretty technical person and I was certainly interested (in Flat Connections). It was a challenge though, so I know that other teachers in the project who were English teachers or history teachers who are not so technical had a hard time. Now, I am a part of that support for them to be able to answer questions, suggest ways to do things or show them blogs I've used with my students. I'll do whatever it might be to help them along.

Wenger et al. (2009) posited that "learning together forms a valuable perspective on the communal aspects of technology. It is more demanding of technology than keeping a list of friends or exchanging messages, it implies that technology will help us find learning partners and engage with them meaningfully" (p. 4). This addresses the participatory environment that increased the probability of strengthened teaching as queried by Research Question 1.

Contemporary Technology: 21st Century Tools, Ideological Differences, and Experiential Growth.

Wenger et al. (2009) specified that technology extended and reframed how communities organize and express boundaries and relationships, which changed the dynamic of participation (p. 12). The interactions between 21st century technologies and ambitious teachers can produce synergistic environments in which participants can develop on both personal and professional levels. Access to remotely located resources naturally sanctions exploration of the world outside of the classroom often resulting in interactions never imagined. While the benefits of using technology devices typically outweigh the complications, ideological differences are inherent when implementing changes.

Twenty-first century technology. Digital technologies make possible associations with experts and chances to join special interest groups. Schreck (2009) noted that these communities have created opportunities to "expand one's exposure to trends and issues" (p. 170) that are relevant and pioneering. The utilization of ground breaking applications created favorable circumstances for contemporary learning. Iris described the significance of her 21st century digital network and the connections it made possible for her students.

> Over the last 5 years Skype has been used for many global linkups in real time. The latest link up has been with an author from New York who would video conference into our library with a small group of our students. Successful linkups

> have been made with personnel from our sister Geo Park in Hong Kong in which experts share images of the fascinating geological features there. We've also had geologist from China who was interested in the park in Hong Kong – a true global classroom comprising multi-age groups, a variety of expert levels.

Enriched collaboration created by teacher associations led to opportunities for students to interact with diverse learners. Abby, a computer teacher, modeled one of the benefits of this contemporary practice when she extended her talents as a moderator in a virtual Flat Connections project. Her desire to learn through continued engagement allowed those who were not in attendance to participate.

> I am a virtual moderator for the Flat Connections Live in Sydney. I'm helping to moderate virtually so these 10 teachers can participate in the project because they can't make it to Sydney. So, they will be able to participate with the teachers that are at schools and create projects with them. Our goal on the Flat Connections Ning is to communicate using both synchronous and asynchronous modes.

Richardson et al. (2009) recognized in 2009, that forward thinking technologies like Skype and virtual meeting tools had the potential to influence learning and instruction in the near future. He stated they are creating "fundamental shifts that are fueling our capacity to connect, interact, and learn with others in new and different ways." A participant shared one advanced technology principle of resource procurement that she found useful. Hope, a fifth grade teacher, shared a 21st century concept called pull and push technologies. Simplified, she explained it this way, "rather than looking for

information as in “push” technologies (i.e. Google search), “pull” technologies bring the information to you after it’s been requested.” She gave examples of modernized pull technologies such as RSS feeds, Ning communities, and networking organizations and continued:

> They can bring you constant stream of relevant information that you may not have thought about searching for or known that it exists. They save time by curating the best of what’s relevant in a specific field for personal and public use. This co-construction of resources, by experts in the field, saves significant time in locating and sifting through all that’s available. If you put the time into setting up RSS Reader, then you will receive information that is on your chosen topic.

While the use of technology has become dominant in today’s society, Wenger’s et al. (2009) philosophies emphasize the social aspect of learning and technology use. When moving from one digital application to another, organizers must manage the implementation and regard the social approach in order to safeguard the member’s experience (p. 136). In a conversation between Hope and the parent of a new student who was relocating, the mother stated that she wanted her son to have a seamless transition into the new school. His knowledge working within an iOS platform would become obsolete because this transfer required that he learn to use a PC platform. Hope reflected and questioned;

> Like his mom, we want our experience to be seamless, with information synched between all devices, easy access and sharable with colleagues, parents and

> teachers. How do we create that environment within our schools? I think we need to be moving more towards cloud storage, collaborative web tools, and pull technology.

The need to advance conventional instructional practice in the field of education is indisputable. Research Question 1 examined the impact participation in virtual communities, specifically Classroom 2.0 and Flat Connections, had on enhanced teacher instruction. The availability of resources is boundless yet an understanding of the most suitable environment for its implementation is unclear. Twenty-first century advancements can revolutionize the classroom, but success is dependent upon educators having a clear and well-developed instructional philosophy.

Ideological differences. Best practices are most effectively implemented by those whose ideological beliefs leave room for knowledge building. Richardson et al. (2009) believed that "committed people who are willing to push themselves and each other in seeing the learning world in a different light" may be the ones who find success in their efforts. When asked about technology operations in her charge, tech savvy Carla described an exasperating scenario that many teachers have encountered.

> Teachers are usually receptive to hearing about new technologies; however their frustration lies with access to the technology. With few labs and older computers that run slower than ones in my lab, teachers are hesitant to implement assignments that use technology. I find this very frustrating, yet I totally understand. I feel very fortunate that my lab has newer computer and I have the

> knowledge to work around most issues that occur quickly and efficiently so students are not losing out on learning. However, most teachers do not have this ability, so frustration tends to take over and you know what happens next, they stop using the technology. I really hope our district can somehow find funding to implement a 1:1 initiative or at least grade-level classroom sets that student and teachers can utilize.

Grace, a library technology specialist whose ideas contrasted other participants, also recognized that apathy could contribute to lack of interest and use. When asked if she could see utilizing a Ning for her staff as a form of interaction and collaboration, she definitively responded, "No." When further probed she replied;

> I wouldn't use it to collaborate with the staff I have here. Most of them don't even know what a Ning is. I just feel like for us to collaborate causes stress and it is easier for them to just go face-to-face or just shoot off an e-mail.

In this situation, Grace was not willing to challenge teachers' outdated practices and instead chose to leave things as they were. As a self-initiating learner, Beth elaborated on how the concept of teamwork was remediated over time. Her past experiences have not all been positive and she used the term 'slacker factor' to differentiate her early work in groups from her current efforts in Flat Connections.

> You probably remember when you were in elementary, middle, and high school you were in those groups and would get *those* people that don't do their part. It's so frustrating and you end up doing the project all yourself. It's not like that in

> Flat Connections. Here you have people who want to be here, people who want to give you feedback, want to give ideas, and want to help so you don't feel like you're out there just sort of flailing on a boat by yourself. The slacker factor is gone and everyone here is ready and willing to work together.

Educational discourse that rouses decision makers must include solutions to the elements that attract and deter people from using revolutionary tools. The initial fear factor must be alleviated so the ideological commonalities between teachers can be revealed thus generating interest and eliminating resistance. The first research question results intimated that the high learning curve must be reduced so that the richest learning excursions can be accomplished by both teachers and students.

Experiential growth. To optimally and successfully use technology devices routine practice is imperative. Skills and proficiency become stagnant if used infrequently. Often, the application of technology for personal or professional use makes apparent its value. Abby described it as training on demand. You're learning as you're going and that makes it more meaningful than if it was done separately. Iris illustrated meaningful technology use as she shared her personal growth experience.

> When stuck in a traffic jam in Melbourne and needing to be at a meeting within minutes of the jam, my daughter helped me use Google maps which showed the extent of the jam and the predicted time to get to my destination. This allowed me to alter my driving route and get to the meeting on time. As I love travelling, I use the trip advisor app for all manner of things when away from home. Having a

> mobile device means that I can join webinars whilst travelling on a train and moderate weekly webinars from home.

Teachers were akin to Eliza when she said that the ability to personally interact with opportunities allowed them to learn on their own terms. Beth referred to this learning environment as “safe and not intimidating.” Eliza echoed the concept when she stated, Harvard classes are out there. MIT’s classes are out there. Stanford’s classes are out there. You can attend anything, anytime, anywhere and be learning from the best minds in the country.

Membership in virtual communities of practice provided flexibility in learning through the use of a myriad of applications and devices. Tools ranged from those that required little technology experience to those with complex processes that required technical support. Eliza shared her professional philosophy on expanding learning parameters resulting in growth.

> I think it's changing and it's going to continue to change. I think there is still a whole lot of value in being face-to-face with person but I think that there are some things that we do that don’t need to be face-to-face. We can be learning online with our peers and possibly the people who are more peers to you than people who might be closer to you geographically. I think there a lot of opportunities for us to be learning and have open our eyes and take those risks of doing learning things differently because things change.

The experiences of these teachers confirmed Wenger's (1998) social learning theory. As people increasingly use the web to connect with and find each other, to express themselves interactively, and to form communities, it is becoming a medium that shapes the social world, by usage and design (p. 179). Iris, one of the most experienced participants, eloquently stated, "…my greatest wish is to teach my students how to be lifelong learners and to be well equipped for the digital world that is theirs." Educators' willingness to embrace learning on multiple levels served as a model for students' development and growth.

Focused Management: Efficient Work, Organized Instruction, and Working Examples

Teachers' managing an overabundance of student paper work, lesson plans, and responsibilities is a universal scenario in classrooms. Wenger et al. (2009) articulately said, "busy people want it all in one place" (p. 50). Practices such as filing papers and hand scoring assignments have become outdated as technology that enables content management has simplified mundane tasks such as organizing, combining, searching, and completing written documentations (Wenger et al., 2009, p. 83). Technology has introduced numerous implementations that support efficiency and the organization of materials that lead to high instructional quality. Streamlining procedures makes way for comprehensive scholarship from which progressive work examples can emerge.

Wenger et al. (2009) stated that technology affords new ways for communities to handle the management of its documents. Members can engage actively in a less

structured, distributed fashion…whether in the collective production of documents like wikis or the collective development of structures for organizing resources through links and tagging (p. 84). Well-planned and ordered resources enabled teachers to give direct attention to their instructional practices and content delivery. Wenger's expertise on social learning and collective endeavors provides backing for efficient management of resources for best practices. Ahrens and Zaščerinska (2010) concurred that collaboration and sharing through sample works confirmed productive relationships that resulted in knowledge creation.

Efficient work. Productive endeavors are often the result of dynamic teamwork between enterprising individuals. Many online tools, like Diigo, a social bookmarking site, and Elluminate, a virtual meeting tool, combine the best of collaboration and distribution of knowledge. Carla made a statement regarding the complimentary effects of shared efforts.

> The ability to easily share documents with fellow colleagues and administration has made some processes that were once time consuming and tedious much easier to complete. One instance where this became very handy was when scheduling conferences this past fall. Our principal created shared spreadsheets that had the times for the conferences split out into appropriate conference segments. We were then allowed to call parents we'd like to schedule an appointment with and update the schedule ourselves. This way we could see what was available and leave comments and messages so everyone was on the same page. During conference

> night if we were unable to attend a conference we could leave a message for the team listing concerns we had in our class. Another feature of Google Apps for Education is forms. Forms allow for the creation of quizzes, surveys and questionnaires. This tool is a great way to gather information from parents about contact information and other any other information you may need to know. All information is easily accessed in spreadsheet form and can be manipulated any way needed.

Beth participated in an online course that demonstrated the collective power of one notable suite of tools, Google Applications for Education. “These tools have made me a more efficient educator giving me to ability to easily collaborate with fellow staff, parents, and students.” Carla also expressed an example of this partnership. She stated “One of my colleagues and I created a Digital Citizenship Policy that we will use and share in our classrooms when teaching digital citizenship and especially when expanding our connections to the outside world.” Eliza strove to minimize duplications of work. When she developed something like a permission slip or if she just came across a great new tool that she found on the web, she would offer it to her colleagues and say, “Let's all use it in this project.”

Being able to easily share documents with fellow colleagues and administrators has made once time consuming and tedious processes easier to complete. The application of suitable programs, such as Google Apps for Education, can be robust if employed properly and used for multiple educational purposes. Carla used Google Apps to gather

contact information from parents, which was then easily organized in a spreadsheet and manipulated as necessary. She shared the benefits she observed with students.

> …Google Apps for Education Suite makes communicating and sharing information with students so easy. The use of Google Class Folders has all but eliminated my need to print anything in my class. I have created shared folders that keep all my classes and student documents organized for easy access. I am able to send out documents to each student's folders with whatever setting is needed for that project. Students then have access to this document in the shared folder that Google Class Folders created. Now that I have used this tool and its features, I can't image going back to the old way.

The efficacy of strong personal management becomes an asset to those who apply it. Some teachers reported they felt frustrated when there was a lack of systematized organizational plans. Instructional excellence can be achieved when the necessary materials are at hand and a deliberate planning using pedagogic practice is implemented.

Organized instruction. The management and preparation of instructional resources has the potential to facilitate flexibility and efficiency in teaching. Awareness of instructional objectives coupled with systematized planning creates environments where teachers can take learning to higher levels. The pragmatism of appropriate tools use was valued by both Diana and Carla. While Diana's expertise is in secondary social studies and has taught for 17 years, Carla's background is in technology and has only taught for six. Diana shared;

> I definitely think it (tools) has helped my organization and theirs (students) as far as when it comes to them handing in something or me being able to observe their online collaboration and do an observation on students. It gives me flexibility to be more productive which make me feel very organized.

Carla emphatically stated, “All these tools have changed the way I teach and communicate with the education community. Using these tools has made me much more organized and efficient as an educator.” Best practices include systematic approaches to instruction and learning.

The organization of materials and resources permits teachers to deliver meaningful content as the necessary tools are right at hand. Iris’s personal trials exemplified how organization made the classroom events she wanted to expose her students to possible. She mentioned:

> The projects often make use of workflow tools, time bridge meetings to enable participants to choose appropriate times for meetings. These online meetings bring the full impact of our different time zones, school year differences, and extra-curricular activities. The tools used in Flat Connections helped me with my own class time management skills.

The organizational features that technology offers must be balanced with a focused purpose. When used consistently and effectively, the advantages of attentive practice diminished the chaos of disorganization and intensified the curricular momentum delivered to students.

Working examples. Preferred learning styles are as individual as the people who possess them. While some prefer that step-by-step processes be demonstrated, others choose to explore on their own. The following unanticipated theme arose from the data evaluation period of this research. Within the concept of focused management, many teachers sought to have others' experiences presented to them as model to follow and as a way to anticipate pitfalls. Ertmer et al. (2010) stated that some may not understand how some ideas transfer into practice therefore providing concrete examples becomes an important strategy to facilitate knowledge. Carla encountered some reluctance with teachers capitalizing on the transformative possibilities of technology so she shared her experiences with them.

> I'm able to say here's what I did. Look at how easy this is. Let's set this up. It's great that I can be a model or be the guinea pig that gets to beta test certain pieces of software and programs. If I can't say this is how I used in my classroom or this is how I'm using it in my professional world, my teachers aren't going to follow. So being able to say this is what I did with my group, they are more likely to try and do it on their own or at least let me help them get started.

Even Hope, had a similar experience providing working examples for teachers. She shared:

> Using some of the new tools with kids in my own class gives me more credibility with the teachers I am trying to get to use technology. It also gives me a chance to try new tools and find what works and what doesn't work.

Hope openly talked about her reflection on a class experience in which the outcomes were not what she expected. She was able to identify the areas that needed fortification and develop a list of guidelines to address these issues. Recommendations were available to anyone embarking on the Digiteen Project in Flat Connections. Also outlined were revelations from her work on the Digitween Project. She explained the stages of a working model which benefitted her and any colleague who sought success when attempting these projects.

> While I knew the Digitween Project my 6th graders were doing would include many of the ISTE Nets standards, I didn't realize how important their mistakes and trials would be in pushing them to use the other ISTE Nets standards (creativity & innovation; critical thinking, and problem solving). Here are some tips to help manage a Long Term Project with multiple things going on.

Teachers are held accountable for many things, some of which there is limited time to complete. Having the correct tools to complete the job makes success foreseeable. "Tools that are seamlessly integrated are likely to feel more close at hand and accessible since they are designed to work together" (Wenger et al., 2009, p. 50). As technology simplified routine tasks, teachers reflected on newly enhanced ideas about practice, advanced learning opportunities, and important cooperative interactions.

Supportive PLN communities combined with contemporary technology devices that validate methodologies provide a higher likelihood of bolstering teaching practices. Focused management for content delivery supplements those practices. In order for any

new strategy to stimulate a transformation participants must feel empowered and respected as agents of change (Schreck, 2009). Research Question 1 evaluated the effect PLNs and communities of practice had on improving teaching. The data revealed encouraging outcomes when teachers were connected with like-minded colleagues, felt supported when implementing new instructional strategies, and had confidence in effectual planning. According to Tapscott (2009), technology cannot live up to its potential if it is delivered using old-fashioned methodologies. A model for contemporary best practices should include the affordances of technology at its core.

Research Question 2: Collaboration

The second research question (RQ2) investigated the influence of personal beliefs on collaboration. RQ2 asked: *How do teachers' beliefs of collegial collaboration influence their engagement in virtual communities of practice?* (Appendix A). There were three sub-questions contextualized RQ2:

1. In a typical school situation describe how you usually go about collaborating with your peers.
2. How did you use those collaboration techniques to determine how and who you would work with in Classroom 2.0 or Flat Connections? (What drew you to the certain people you chose to collaborate with?).
3. After participating in Classroom 2.0 or Flat Connections have you beliefs on how you collaborate with others changed? Can you describe that?

During data analysis three broad categories became evident: authentic engagement, communication impact, and social networking. Under each of these categories three themes and patterns were identified.

Technology's advent has reorganized what was once believed about learning and virtual spaces that accommodate scholarship. These "evolving digital habitats give us the chance to reconsider what we know about communities and rediscover fundamental ideas in new settings" (Wenger et al., 2009, p. 21). The knowledge of best practices in teaching challenges 21st century educators to consider worlds where community resources and global collaborative involvements become the classroom. Authenticity in learning through real-world endeavors, which include ongoing problem-solving and deeper critical thinking, have now become the norm.

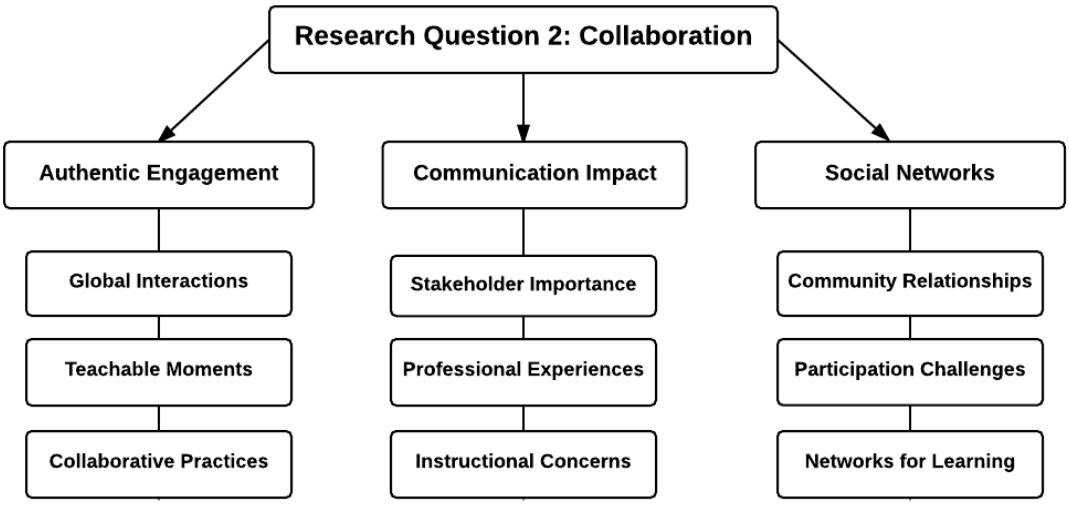


Figure 3: Collaboration category mind map

Analysis revealed three general categories from which three themes emerged. The term *authentic engagement* symbolized the closest replication of learning scenarios within virtual communities that represent real-world events. *Communication impact* indicated the effects of sending information to people through the use of technology. The practice of generating user created content and increasing social contacts through technology is referred to as s*ocial networking.*

Technology has become the opportunistic problem solver in many fields of work and study. Transforming partnerships within communities of practice as well as maximizing the potential for teacher learning, has deemed it instrumental in creating change within organizations. The ongoing interaction between communities and technology has created an intertwined system where each is reliant on the other. New technologies push the boundaries to meet community needs as innovation caters to a fundamental human need for social interaction (Wenger et al., p. 20, 2009). Research Question 2 challenged teachers' beliefs on collaboration to determine the impact it had on their engagement in virtual communities of practice. Educators modeled numerous examples of collaborative ingenuity, deliberate conversations with stakeholders, and navigation of risks in social networking resulting in unique and diverse applications.

Authentic Engagement: Global Interactions, Teachable Moments, Collaborative Practices.

Historically, collaboration in education included the sharing of good lesson plans within grade level or content area. Typically, one teacher became the main provider of

information and the others receivers. With the advent and growth of educational technology, the significance of teacher collaboration has had to match the "rapidly evolving technological landscape" (Abbitt, 2011, p. 295). Global interactions, spontaneous learning moments, and unique collaborative methods pave the way for authenticity in learning. Tapscott (2009) stated that changing work processes requires a receptive culture and tools such as blogs and wikis that encourage collaboration.

Iris, a 27 year veteran, recognized the new vision of global collaborative practices as she worked with her elementary students. She shared her forward thinking ideas on global collaboration when she shared:

> Working collaboratively means that no longer can one person be in charge of the class and make decisions regarding the timing, content, procedures, outcomes etc. (as occurs in a traditional classroom). There has to be give and take, a sense of humor, trust between the parties involved, commitment and passion.

Open communications between practitioners strengthened relationships and practice within communities of practice. The coalescing of ideas and methodologies resulted in a stronger foundation which contained elements of each participant.

Global interactions. Geographically distributed communities link people across time zones, countries, and organizational units. Just like local communities these groups are conducive to the sharing of ideas and the support they provide. Communities of practice that cannot rely on face-to-face meetings and interactions as a primary method of connecting members are considered global communities (Wenger et al., 2009, p. 116).

Through teacher participation in virtual communities of practice, local and global communities were established and served as an arena for teacher membership and growth. Deep engagement in community supported the endeavor of self-generated learning opportunities and instructional resources.

Carla, Iris, and Abby each sensed the value and need for global collaboration but emphasized that it should be taught along with global skills and digital citizenship. Abby described her integrated approach teaching students how to diplomatically problem solve through their social interactions to become effective global partners.

> In social studies we talk about this idea of being a global citizen. What's neat about these projects is it allows us to have authentic experiences where kids get a really good sense of what it means to be a global citizen. What it means to be in working groups with partners. If I don't have face-to-face time with them, how do we work on communicating and relying on those global partners? What should we do when our global partners aren't reliable? The ability to problem solve like that and group work, it really is a 21st-century feel which is hard to do in a traditional classroom. So, it's changed my teaching in that way I can teach students in a tangible way. I can have a real conversation about being global citizen and collaborating and using problem-solving skills in a real environment.

Global citizenship should become a compulsory feature in the education of students who "view technology as just another part of their environment" (Tapscott, 2009, p. 18). Twenty-first century students can easily and fearlessly interact with multiple devices at

one time. This suggests that their effortless ability to adapt to new technologies is just another way of learning for them.

Iris, the only teacher without a Master's Degree, holds a Bachelor degree in Business Commerce. In comparison to the other participants who hold Master's degree, her expertise and knowledge appeared to be from her full commitment to accessing learning tools for herself and her students. She stated that being in an isolated community prompted the need for more substantial learning opportunities. She richly expanded her students' authentic learning experiences from the knowledge she gained using Flat Connections. She shared:

> The students from the two schools in Malaysia had not blogged before, created videos, nor worked on a wiki before. It was a steep learning curve. We had to learn together and experiment with which tools were the best for sending huge files (as we needed a good quality video for the big screen) to the Melbourne Writers Festival people. Students learnt how to hyperlink text, embed YouTube videos, work together online and appropriate netiquette.

Iris continued describing her experiences and through her practices corroborated the influence global collaboration had on her students. Her instructional strategies had gained notice regionally and her small school had been privileged with a technology grant from Microsoft. She shared a genuine experience she was able to provide for her 7-12 year old students.

> A small group of students formed student action teams to work on two trial projects with the Innovations and Next Practice division of our state Victorian Education Department - *Learning Responsibly Online* and *Digital Demons – Playing by the Rules.* The latter project involved student action teams from across Victoria who worked with the Melbourne Football Team. They explored appropriate behavior and safety in social networking and other online sites for example; Facebook and Twitter. Here high profile sports players networked and then relate back to schools and individuals. The footy players were honest in the mistakes they had made and shared their experiences. The student groups surveyed students in our school and other global participants on their use of the Internet. The student team was concerned about the number of hours that students are online networking (some well after midnight). Students created a digital video on cyber bullying, uploaded it to YouTube and shared it with their classmates. They also wrote several articles for our local newspaper.

Student interest and motivation are part of Iris's educational approach. These rich experiences will be long lasting and transferable in students' future. Authenticity in learning is extremely appealing to students of all levels (Richardson et al., 2009). The combination of a creative teacher and modern ideologies make interdisciplinary project based opportunities the new benchmark in education. Classroom 2.0 and Flat Connections provided favorable circumstances for global learning to take place.

Teachers' brought their initial beliefs into this collaborative forum which magnified opportunities for participation and took globalized collaboration to a new level.

Teachable moments. Veteran teachers have unique perspectives on numerous aspects of education. Longevity has rewarded them with insights that permit richer understandings. The similar experiences of Abby and Diana touched upon some of the challenges created by online collaboration. As professionals they regarded these situations as teachable moments. Diana shared:

> …virtually…is the perfect place to do it. And that's exactly what that project accomplishes because we had students on the project that went out and wanted to continue this conversation on Facebook and we said "Whoa, Whoa, Whoa! Let's talk about this and why we use these tools that we use and the importance of being part of the community and being transparent where everybody can see what everybody else is doing. We were able to have conversations. And those are powerful conversations because so much of what they're doing is they're using it for social media and social reasons. They use Twitter and Facebook a lot, for those social interactions. What this emphasized is this is a professional environment. We are learning how to communicate in a professional environment and the Ning, although it can be set up like Facebook type of environment, it's still not Facebook. So, what does it mean when we go out and have conversations on social media? How much of that becomes part of their digital footprint? We have those conversations too. So this project allows for those conversations to

> happen in this area. Then they see what happens when they go out and do something inappropriate and how that impacts others around them and potentially impact them later on. I make sure to say that we are able to see everything they're doing and it's password-protected. We have a lot of conversations around that's what we don't let them go out to Facebook and use tools outside of the project because you really feel it's important for all of us to be seeing. It happens on every project where student will make a mistake or do something that's culturally insensitive or something that's considered not being a good digital citizen, and that becomes a teachable moment which we focus our conversations around that and that's is one of the best learning experiences for our students.

Skilled and vigilant teachers can anticipate imminent issues with students having access to technology. Their ability to foresee potential consequences became indispensable as they seized opportune moments to connect with students. The experienced teachers were able to turn these moments into teachable experiences.

Almost all of these teachers have spent time sharing or supporting others through collegial collaboration. Only the case of Grace, who taught in a small parochial school, was an outlier. Demographic information revealed she spent 4 years as a technology teacher and the last 2 years as a classroom teacher. During the interview when asked about her collaboration with other teachers she stated:

> I don’t do Nings so much anymore. I find that PLNs can become overwhelming and hard to use. I find that the Classroom 2.0 Ning is overwhelming and a lot of

> my teachers wouldn't use the Ning. That's not their learning style. A lot of my teachers in the high school have probably never even heard of a Ning.

While the other teachers mentioned obstacles that caused bumps along the way, these issues seemed typical for any classroom. Some of the situations included differing school holidays, varied time zones, and school times which resulted in communication being completed beyond school hours. For eight of the nine teachers these hurdles proved to be the times in which their resilience and professionalism emerged, indicating that even instructors needed to capitalize on teachable moments.

One instance of an opportune learning experience was described by Richardson et al. (2011) when he spoke of one teacher's serendipitous connection after having read a blog post with which she disagreed. She responded through her blog which was then read by the original author which prompted him to contact her. This unexpected interaction became a learning opportunity for this teacher. With some ingenuity, unplanned events like this may inspire active participate in endeavors which stimulate educational growth.

Collaborative practices. Meaningful collaboration is the heart of communities of practice and personalized learning communities (Wenger et al., 2009). The inherent nature of sharing and nurturing growth is teachers' modus operandi. At the core of Wenger's ideology is the fact that inclusionary practices build stronger communities. Carla's description of her collaborative effort demonstrated her eagerness to connect with her teachers. She shared:

> I'm always looking for different ideas that I can do with the teachers and ways that we can integrate technology together. For instance the science teacher and I just collaborated on Google forms. I went in there to talk to him about a different collaboration idea I had on simulations and he was working on a unit were he wanted the kids to write their own quizzes and I said I have the perfect thing; they can do it in forms. And then you could have them grade their own quizzes so all they would have to do was come up with the quiz in forms and they had to send it out to five of their classmates. Not just in the classroom but out in their entire grade level. Then they have to take those five quizzes and grade them. It was a good way to show them how they could use forms for that.

As matters arose they were negotiated for reference in subsequent experiences. Iris's remote Australian location seemed to produce a unique set of concerns. She said:

> …some of the other issues that arose were the different cultures and different age groups that were involved sometimes had different expectations but any problems and issue had to be collaboratively worked through. There was a real non-negotiable time-line to work to, and there were constant reminders and reassurance from all those involved, regarding work load, content, and what had to be done and how it had to be done. We made use of the wiki discussion tab to answer questions regarding the technical requirements and issues which meant a professional technical team also had to be collaborated with – these were the people responsible for the video, sound and other spaces on the actual day. Three

way communications often took place between the two schools and the organizer of the event. This meant getting used to different accents, ways of saying things. Iris's experience allowed her to focus on pragmatic opportunities that extended the possibilities for her students. She sought innovative ways to immerse students in authentic learning experiences. This expanded her and her students' growth exponentially.

Abby best summed up her learning and collaborative actions within her virtual community of practice when she said:

> I would say (my experiences) were authentic, collaborative, and enlightening. It does take you to another level. It's like in Bloom's taxonomy. You want to get to that last level where you are doing authentic learning and applying your skills in real world time. You're not just doing this for yourself, there's an audience too. Now, that's real.

Wenger (1998) asserted that the social interaction within communities of practice is what expands the purposefulness of those CoPs. The advancing of these communities "is not in and of themselves as specific activities, symbols, or artifacts, but from the fact that they belong to the practice of a community pursuing and enterprise" (p. 82). Genuine engaging activities make the instruction worthy and the learning worthwhile.

Tapscott (2009) emphasized that authenticity in engagement through globalized encounters, seizing teachable moments, and strong collaborative involvement contributed to a connected world never imaginable. He stated that the power of distributed learning

has resulted in “knowledge flowing more freely than ever” (p. 280). The Internet and the digital tools now available make it “far easier than ever to connect with each other and the rest of the world: (p. 282). Research Question 2 presented a lens in which teachers’ perceptions of collaboration could be examined. Meaningful educational engagement accomplished through collaborative means extended the approaches and spaces existent for learning.

Communication Impact: Stakeholder Importance, Professional Experiences, and Instructional Concerns

One of the means to ensuring program viability is communication with stakeholders on the topics of central programming, present and future goals, and potential concerns (Schreck, 2009). As interested parties become involved in program maturation their continued connection offers a foundation for support and success. Richardson et al. (2009) added that communicating how it will save the school money, reduce the environmental footprint, and better meet the needs of every learner will influence a wider range of constituents and build support for your program (p. 126). Teachers who communicate their experiences develop greater perspectives which can provide insight to forecasting security issues assuaging parental concerns. Preplanned strategies for safety and success must be in place prior to implementation and a straightforward approach in planning establishes transparency which makes stakeholder backing more probable.

Stakeholder importance. Stakeholder involvement is crucial to the success of most programs. This is especially true in education as my research found evidence of the

value of supportive stakeholders. Teachers' remarked on how technology increased their ability to keep families informed of class activities and lessons. Through the use of technology, Beth's 13 years of experience confirmed the advantages of this level of communication when she stated:

> Students and parents can review the work completed in class and can open a dialogue on the subject matter and ask questions as they review together. This would be a great opportunity to take the teaching portion of my class home to parents. It would create a stronger partnership for learning – one that could enhance the technology shift in the culture at our school.

By providing families with regular access to their child's assignments, class events, and important information, Hope stated the feeling of being on the "same team and working for the same cause" could be positively nurtured and grown. Schools and teachers found that using technology for communication played a vital role increasing parental involvement. While Felix found success in posting all of his class assignment details on his Ning, he also found that students' capacity for using resources and the ability for parents to support his instructional efforts had improved. He remarked:

> I mainly use blogs and Nings to post information for my students and parents. All the assignments, directions, and due dates are posted there and I also provide a supporting video that either walks them through the process or is an example of the assignment. What I gained from Flat Connections and using technology for so long is something I find myself saying to students all the time is you have to

> figure it out. I'm trying to encourage them to make their own decisions and figure things out as opposed to asking me for the answer.

With aim of gaining parental support, Beth, a high school English teacher, reflected on how her use of virtual environments and web-based tools had changed the collaboration between herself, parents, and students.

> This tool has been a great asset for students, parents and teachers. Using Google Sites for our website helps keep parents informed of assignments, news, and anything in particular they need to know in their child's classroom. They can look at each teacher's website to view homework, announcements, and special dates. Parents can also view their child's progress in Google Drive in junior high. Teachers write comments on students' docs and presentations. Parents can view the progress as they create their projects. The school and classroom calendar keeps the community updated as well. School announcements are immediately posted and sent through social networks so that everyone is informed.

Transparency in communicating with stakeholders is vital to keeping them informed as well as being supportive of your educational efforts. Iris, the colleague in Australia, used a virtual collaboration method for this purpose.

> I shared a link with parents to sign up for a conference with me. I held evening meetings for parents which could be either face-to- face or virtual (involving web conferencing). Students could be present and show how many of their favorite online sites work, and share how to have strong and safe digital profiles.

Teachers recognized best practice related to the collaborative domain, whether online or in the classroom, required cooperative engagement. While many of the teachers' ideas on collaboration were in place before membership in Classroom 2.0 or Flat Connections, their philosophies were strongly aligned in this area. These educators engaged in robust communicative practices that mirrored the ideologies of both virtual communities.

Professional experiences. Alliances between colleagues advance professional growth for both parties. A reciprocal relationship built camaraderie and encouraged collegial work. Instructional techniques informed practice through the complimentary effects of shared personal accounts. Beth detailed her initial reluctance to virtual participation and stated her need to acclimate herself to learning within an online community Ning. Once comfortable with this style, she extrapolated that her level of engagement would be greater if she were engaged in activities that suited her professional needs. She went on to continue her engagement and growth within Classroom 2.0.

Carla availed herself of the various technological means for communication. Her enthusiasm for using collaborative devices led her to remark on the changes apparent in her practice. She shared:

> All these tools have changed the way I teach and communicate with the education community. From sending out a form to collect information from parents, to attaching a rubric for grading, to shared documents that staff can collaborate on quickly and easily. Using these tools has made me much more efficient at my job of educator.

Beth spoke of this learning transaction as an interdependent, judgment free, knowledge bank. The information exchanges were advantageous to all participants whether novice or experienced. She included:

> There are a lot of people out there who are willing to share their information, their wealth of knowledge no matter how significant or insignificant it may seem. I learned a lot of the technology tools that way and for me that was really a big deal just sharing that kind of information.

Wenger et al. (2002) believed that communities attract an informal group of people who begin networking around an important topic in an organization usually (p. 70-71). Research participants had mostly positive virtual learning experiences. Thus, they were motivated to continue their professional growth through continued involvement in Classroom 2.0 and Flat Connections.

Instructional concerns. The use of contemporary technologies can open the door to host of opportunities as well as a plethora of dangers. Beth, who initially had reservations about typical technology use and training, eventually developed an enthusiasm for the use of these innovations. Her desire to apply new ideas and technological instruments brought her to pursue administrative support. She added:

> My assistant principal is excited that I am integrating a variety of technology into my lessons. He told me to continue and let him know if I needed help. The tools I have introduced to my classes have never been used at this school in the past.

A typical educational concern is the possibility that students will find their way to inappropriate web content. Information shared with students and parents should include the school district's policy of vetting and applying filters to websites to decrease the likelihood of this occurring. Beth scripted a well-defined document that delineated the school and her policy on the abuse of technology in school. She added:

> Indeed, our students hear the concerns about Internet safety and cyber bullying from our administrative team, but students do not heed those warnings. Now, parents have the safety information that their child must follow. I firmly believe that when students hear this information from a classroom teacher who actually uses and monitors those technology tools regularly, it has a greater impact.

Carla also negotiated the matter of well-defined policy and recognized the importance of procedural phases.

> I'm also going to pursue a blogging challenge called "Student Blogging Challenge" through Edublogs. I am going to start the process of getting permission forms for students to create blog accounts. I feel I need to start now with this process so I can secure all the forms well in advance of this challenge. During this blogging challenge we will discuss the nine components of digital citizenship and what makes a good blog. I will require that each student create an original blog that meets curriculum objectives but also maintains the standards expected by me and the district on technology use. I have really good students but there is always that one so I have to lay it out clearly.

Similarly, Hope considered ways of indoctrinating students with constructive thoughts about the use of technology in the classroom. She thought to capitalize on her young students desire to use computers and tapped into their empathetic nature. She drew upon her knowledge from Flat Connections. She said:

> One of the lessons I learned through Flat Connections is that you need to start early getting kids to think about how they would like to teach others (siblings, family, students, and teachers) through an action project. I am beginning to think that having the kids start with family and friends is a good approach. Kids seemed to be more verbal about concerns they had about a younger sister, a friend, a classmate.

While the quantity of learning spaces is innumerable, it is the quality of many of them that teachers and students must learn to challenge, negotiate, and assess before using. Through evaluation and alignment with curricular objectives, it is more likely that the content will meet the rigor of the lesson.

Communication with stakeholders remained the most relevant instrument for positive program execution. Richardson et al. (2009) suggested being as communicative as possible with your constituents in explaining the changes you are trying to effect on your students (p. 80). Shared responsibility in decision making between parents, principals, and community stakeholders creates “group-centered and community minded cultural norm” (Kensler, Reames, Murray, & Patrick, 2011, p. 36). This will give insight

to the connected learning and instructional methods used in your class which may reduce community concerns and increase the program support.

Social Networking: Community Relationships, Participation Challenges, Networks for Learning

The heart of a social network is the web of relationships among community members (Wenger et al., 2002, p. 58). The rich exchanges and collegial rapport create an agreeable atmosphere for interchange. The three themes identified within social networking were teachers' relationships within learning communities, the challenge of encouraging colleagues to participate in practice, and teachers' use of networking for collaboration and learning. The ability to find a happy medium between new prospects and longstanding practices resulted in dynamic educational stimulus for teacher learning.

Tapscott's (2009) study on the transformative events created by the Net Generation revealed advances and technologies that were never imagined by previous generations. He stated the NetGen have reenvisioned the possibilities of the Internet into a place where "people can communicate, collaborate, and create together" (p. 70). While many adults still debate the merits of social learning through networks, this younger generation has embraced technology and has elevated its use as a multi-purpose instrument that harnesses the power of the Internet. Research Question 2's created a platform from which to view the impact that teachers' beliefs had on collaboration in their virtual learning communities of practice. My research provided insight into this relationship and the advantages and set-backs as seen by participants.

Community relationships. Wenger et al. (2009) described community as the close, voluntary collaborative interactions that enable members to invent and share resources that support all sorts of groups and networks virtual teams, friendships and conversations (p. 5). Social exchanges are the foundation of its members' potential to learn together. Beth personified her social networking community as having a personality. "It seems like you felt more connected to the people you were talking to and it was not just another entity on the other end of the computer." She continued by recalling her initial experience of feeling connected when she explained:

> It wasn't just academic because we were able to put those introductions out there and tell about ourselves and personalize our page on Classroom 2.0. For example; there was one lady who I thought was a quilter based on the pattern she chose and she said, of course, no, I don't sew at all, I scrapbook though. Oh, that kind of makes sense, because what else is a quilt if nothing but a scrapbook. It's nice to get to know people a little bit more intimately, more personally on Classroom 2.0 from that perspective. That really made our discussions, academic discussion that much more.

Iris expressed a similar reaction when discussing connections within her network. She summarized the relationships within her community of learners and the bond she developed through engagement.

> From these networking sites, I have made many valuable and long term connections and have found that once you connect and collaborate on a project,

> there is a special rapport existing that is never forgotten and it is easy to take up new projects with them, even after a year or two of non-communication. However, the most valuable and effective partnerships are with those who will connect on a regular basis.

Beth went on to express that authentic engagement in community "allowed you to get to know people on a different level than maybe you would on a regular online dashboard." She described a sense of well-being and acceptance which reduced the intimidation she felt during her community interactions. She deciphered her comfort level within her community.

> I think you're able to pose questions…it's a very inviting environment and there is no judgment if I don't know something. I could throw out a question and people will respond will respond immediately, so I think that's really very helpful to know that you don't have to know everything or be a guru. There is somebody out there who knows or somebody out there is going to know where to send you. I think that's okay because it takes away that, "I don't know what I'm doing and I'm afraid ask." There was always another option for you to find information that is not intimidated.

Eliza stated that these environments are filled with "top notch" teachers who were confident and enjoyed being helpful since they were also once new to this environment. This echoed the hospitable welcome and involvement that both Iris and Beth specified as positively advancing their community participation.

Both Classroom 2.0 and Flat Connections had comparable philosophies regarding effective environments and techniques for meaningful participation. The necessity for human communication, constructive feedback, and collegial support prevailed in these environments as three of the most significant features of these communities. The familiarity gained through engagement was reflected in enhanced teacher notions on collaboration and their newfound ambition for immersion in communities of practice.

Participation challenges. Wenger et al. (2009) surmised that technology's integration into daily educational practice required strong leadership and intentionally organized phases. The planning and facilitation of the transition process plays a pivotal role in the adoption and use of this device (p. 27). Leadership's subtle changes should account for varying levels of interest and skill while ensuring existing connections between participants are not jeopardized. When the individual relationships between community members are strong; the events are much richer (Wenger et al., 2002, p. 59). Eliza, who worked in an elementary school, shared how she intersected with members of an online community that she considered her closest colleagues. She articulated her resident challenge of being a specialist and not having a school team to collaborate with. She expressed it this way.

> I am the librarian and you are the only one of those people in the building so especially for those of us who were singled out in our buildings we're the only one of our kind in the building, so collaboration is a big thing. For me those people who I meet with once a month, those global friendships that I have, are my

> colleagues more than the people in my building are. That is because we have the same views and goals of what we want to do with the students and that doesn't always happen in your building.

Abby's interactions within her social network allowed her to flourished and discover significance in her learning. Her zeal to share her knowledge on social networking and become a catalyst for self-learning was unmistakable. Unfortunately, even her enthusiasm for collaborative networking was not enough to entice her colleagues to capitalize on the capacity that rests in social technology to create differentiated opportunities for their students. She conveyed her disappointment when she shared:

> Often times, I see their walls go up when I talk about Twitter or blogging. It's unfortunate because they are truly missing out on amazing connections and collaborations, not to mention learning opportunities for their students. Some of them are slowly coming around. We are going to a 1:1 model and they need to find the best online solutions for their classrooms.

In this scenario, it appeared that there was a deeper issue than just resistance to technology integration. Carla's understanding of this reluctance to incorporate technology as a teaching tool led her to reflect. She said:

> I found that some teachers were interested in hearing about new technologies. Their frustration lay in the fact that there were not enough computers for all the students and the few that we do have are outdated and run slowly. There were also

no computers for teachers to learn on. I find this frustrating so I can definitely understand why they would.

The challenges to building communities and stimulating participation should be managed as a district or school wide initiative. There will always be those who resist change but having a strong team of leaders willing to rise to the challenge can help mitigate complications. Richardson et al. (2009) outlined typical issues surrounding resistance to change; he called these concerns "Yeah buts…" (p. 133) and suggested possible solutions. Educators who are spread thinly might engage in thinking that included statements such as, I do not have enough time, It's too overwhelming, I need to make sure students pass the test. While these concerns are valid, communication is essential in creating this change. Richardson's et al. (2009) recommendations included the need for flexible and creative teachers, making parents an integral part of the process, and awareness that the networks students learn in today were the same ones they will be engaging in as they worked to advance their careers. He stated that it will not be until teachers take on some of these shifts in their own learning that they will understand the impact this change can have on the future.

Networks for learning. Wenger et al. (2002) stated that, "networks that create a strong feeling of relationship and responsibility to other community members, are a far stronger force for increasing participation and aliveness" (p. 133). He quoted one of his subjects who commented, "My biggest learning is that it is all about the relationships…"

(p. 133). When asked to explain how her networks materialized for her to find like-minded colleagues, Eliza stated:

> It just kind of happened. You develop these connections. When my colleague and I were in the Flat Connections class we just became friends. We worked with the same type of kids and we wanted to work together and do some projects together. So last spring about a year ago I decided I'd really like to do this. We wanted to get more people to work with us in our projects. Why don't we start meeting on a regular basis so that we can throw out ideas of what we're doing in the classroom that we'd like to have collaboration with. So, it just organically bloomed. We added a couple of people we knew and then formed a group to sustain what we wanted to continue to do. I think it's important to find a few people who want to do stuff. So we're trying to look more at what we're teaching to see if we could facilitate more of that and thinking about what else could we do that students haven't done before.

Abby, who had been involved in both connected environments in this study, was introduced to global collaboration and social networking by a university professor. She thrived in her experiences and spoke of the advantages she could add to her skill set. Empowered, her yearning was to remove the stigma social networking had within her school community. She shared:

> I use blogs, Twitter, Edmodo, and other social networks in my classroom in an educational setting as well as personally. I shared as many social networks as I

> could with the colleagues so those who may not be familiar with them could see how it's used. Hopefully, one or two of them will apply in their classrooms or personal lives. Social networks are a vital tool to connect, collaborate, and learn. I am a big advocate of social networks and try to show that using these tools aren't "taboo" both teachers and students need to know how to use them appropriately and effectively.

Established learning environments offer the possibility of a judgment-free culture. Comfortable settings paired with virtual connections are natural conduits for collaborative activities (Schreck, 2009, p. 168). Educators in this study reported that the transition from their former collaborative techniques to innovative virtual collaborative practices occurred as a natural step in their professional learning. Social networking was an instrument that most all participants found valuable and easily customizable. Wenger et al. (2009) claimed that the "close voluntary collaboration in communities enables their members to invent and share new uses for the technologies at their disposal (p. 12). Open-mindedness and creativity proved to be essential in the adoption process.

These findings substantiated Research Question 2 on the influence teachers' beliefs had on collegial collaboration in virtual communities of practice. It was determined that participant's ideas on collaboration were firmly in place prior to their engagement in this environment. Through participation, educators took part in authentic collaborative engagements which bolstered their confidence in continued practice. The importance of community became clear as teachers developed their skills in these open

learning environments and engaged in meaningful professional discourse. Through work in communities of practice, social networking became the model of exemplary instructional practices. Teacher engagement in this community made use of teachers' strengths on views regarding collaboration which magnified the limitless options for learning.

Research Question 3: Personal Learning

Research Question 3 asked: *How do teachers' beliefs of personal learning influence their engagement in communities of practice?* Three interview questions interview questions were used to collect data for collect data forRQ3.

1. Before joining Classroom 2.0 or Flat Connections show did you go about learning more about your field and teaching outside of the professional development your school provided?
2. Can you describe how your beliefs about learning influenced that way you approached learning within the Classroom 2.0 or Flat Connections community?
3. How has being part of Classroom 2.0 or Flat Connections changed your beliefs about how and where you learn? Were your personal beliefs about learning expanded or challenged while participating in Classroom 2.0 or Flat Connections?

Personal and professional awareness provide a distinct growth opportunity that can assist in reaching a rewarding future. An openness to learning permits new ideas and information to supplement teachers' grounded theories. When a new or isolated fact is placed in a context that gives it significance, information is turned into knowledge (Tapscott, 2009, p. 109). The confirmation and renewal of teachers' beliefs on personal learning are depicted through the following teacher narratives which informed Research Question 3.

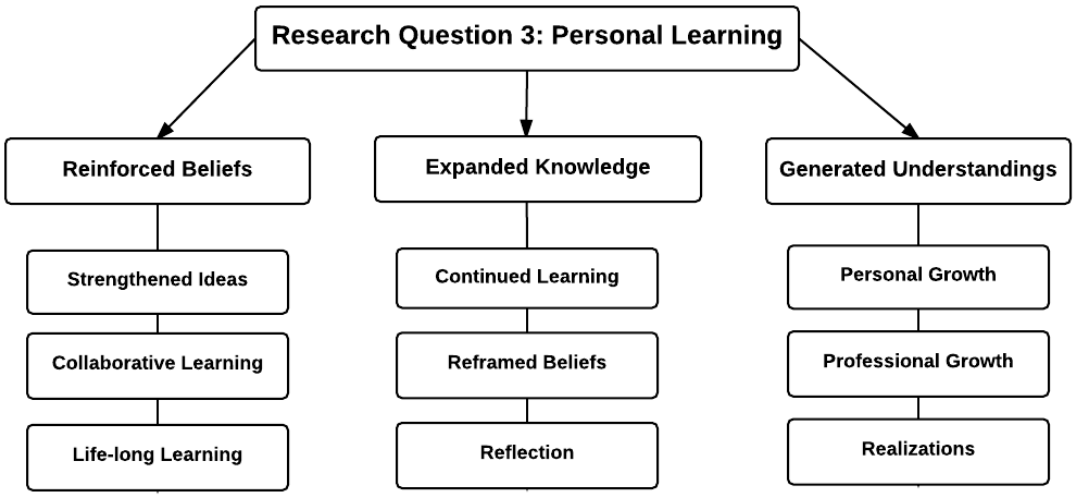


Figure 4: Personal Learning mind map.

During data analysis three themes became evident under the category of personal learning: reinforced beliefs, expanded knowledge, and generated understandings. Under each of these categories themes and patterns were identified. The term *reinforced beliefs* signified the confirmation and fortification of pre-existing ideas. *Expanded knowledge* reported the increase or broadening of range or amount of skills or knowledge gained. The term *generated understanding* explained the growth of comprehension and development of conceptual practices.

Twenty-first century methods of learning now include the personalization of resources and an on-demand system that enables people to work and learn at their convenience, in their interest area, at any time of the day. Learners take advantage of digital and networked technologies not only to seek information but also to share information (Ertmer et al., 2012). Networked communities facilitate global relationships

and contribute to life-long learning. These communities are dynamic and "sustain themselves as members negotiate their meaning understanding its potential, rediscovering, or reproducing the old in the new (Wenger, 1998, p. 96). Wenger's social learning paradigm established that teachers learn as they make connections with others who share interests. Through professional networking ideas can be challenged, restructured, or enriched.

Reinforced Beliefs: Strengthened Ideas, Collaborative Learning, Life-long Learning

Wenger (1998) believed the continued discussion over learning and best practices in education was an issue that was not easily resolved. The formation of knowledge was a life-long process whose phases change as the world changes. This continual renewal should be the focus of education and lifelong learning. Research Question 3 was designed to probe how teachers' beliefs on personal learning impacted their participation in virtual communities. Each teacher interviewed had previously established ideas about their learning which enabled them to approach these learning communities for the purpose of gaining new knowledge. Their willingness to acquire knowledge and use it with students became the catalyst that moved these teachers' practice forward.

Traditional classroom instruction has changed to meet the technology rich learning styles of students in this generation. Tapscott (2009) stated that "for the first time in history, children are more comfortable, knowledgeable, and literate than their parents are with an innovation central to society" (p. 2). Students have "natural affinity" for the revolution of tools and methods that we are seeing. This requires teachers' to

adapt and reorganize their perspectives (Tapscott, 2009, p.9). Through teacher training and experience most educators develop a philosophy regarding best practices for instruction. While teachers in this study had previously established viewpoints on learning, their open-mindedness made room for longstanding ideas to be challenged, expanded, and changed.

Strengthened ideas. Schreck (2009) stated that for change to manifest itself in practice we must "identify prevailing and outdated institutional myths and develop a new proactive story" (p. 131). Teacher narratives indicated small pragmatic changes that provided a platform for refined learning. Carla references her beliefs on personal learning as she discussed her participation in Classroom 2.0.

> It's not that it's new; it just reaffirms what I already knew. So, it kind of opened my eyes to other resources that are out there that I didn't know about. I never knew anything about Classroom 2.0, I hadn't even heard of it. Now, I have new ideas about the other resources that were out there. It's not like I hadn't looked for resources before it's just when I found this one, I felt that it was a valuable resource that I need to keep in my toolbox of things that I can use.

Likewise Eliza, a 17 year veteran, welcomed the challenge of learning as she moved through the process. She shared her school experience.

> I'm kind of a jump in with two feet kind of person so I really enjoyed it. I've had people in some of the projects really need to look at things a lot before sharing them with students. I have colleagues here that wanted to do a mystery Skype but

> they wanted to practice it first. They wanted to have one classroom pretend it was country and another classroom to pretend they were another country. Then they would have to guess what the other country might be. And I was thinking "Why? There are classrooms out there who want to do this with us so why do we have to pretend that were doing this? We can just get out there and do it. For me I just really enjoyed it wasn't a big change for me because I was ready for the new experience.

With 13 years of teaching experience, Beth had participated in Classroom 2.0 for one year. Her ideas were aligned with the concept of learning communities and she expressed her satisfaction with the constructive nature of these communities.

> First, I am happy to know there is a safe community for educators like me who want to exchange ideas and reflections and receive some feedback from like-minded colleagues. Classroom 2.0 suits this need perfectly. I am excited to know that I can post research driven ideas here and colleagues will respond in kind, steer me down the correct path, or enhance my original ideas. I like the simplicity of the site and the intuitive nature it offers users. It's not so complicated that I wouldn't continue using it in the future.

The teacher with the longest teaching record was Felix. He had been teaching for 35 years and engaged with the Flat Connections community for 5 years. His time as a teacher made him confident in his beliefs as he discussed the professional gains he had experienced.

> I‘ve always been open to (different) ways of finding things out. This has helped me and my students to be part of a great learning community. I can’t say that it has changed me or my beliefs. It’s certainly been a great experience for me professionally and for my students.

When asked if her ideologies had been tested by her participation in Classroom 2.0, Carla, who was one of the youngest participants, expressed herself in this way;

> I can't say that my ideas were challenged necessarily, I just learn in the same way. It's not necessarily something I didn't know or understand it's more like here's another resource. Can I find that information someplace else, probably? I would say that my beliefs haven't changed that much in terms of from before I started Classroom 2.0 to after I started. It did make me aware of the fact that there were other resources out there that I can use to find information. I feel that my beliefs are still the same. I'm using technology but now I have extra resources that I'm able to tap into through Classroom 2.0. The way I learn is I still go out and I still find things on the Internet whether it's on Classroom 2.0 or another site.

Teachers’ preconceived theories on how they learn and the notions they brought to teaching influenced their engagement in these virtual learning environments. Their ideas were not radically changed but rather corroborated by their presence and participation. Beth added that the research aspect of her participation was the most exciting. Her pleasure came from searching for an answer to a question and being led and exposed to another answer. The philosophical underpinnings of Classroom 2.0 and Flat Connections ran

parallel to teachers' interpretations of learning within these groups resulting in a deeper experience for them all.

Collaborative learning. Traditional classroom proficiencies included some level of collaboration as teachers implemented partnerships in learning. Updated perspectives on teamwork took into account the tools and communities with which we collaborate. While some teachers needed to be slowly brought into collaborative enterprises others quickly immersed themselves in learning. Eliza indicated one of her most fundamental beliefs was the need to connect with others. Her participation fortified this idea as she became an advocate for connected learning. She believed that teachers should be collaborating with each other.

> I think it (collaborating) became more important and necessary in our society where people work in global environments. Businesses have companies all around the world. My goal has been teaching 21st century skills and collaboration is a big part of that. I think collaboration, as a whole, is powerful. As teachers, it used to be you would shut your door teach. I don't think it should be like that because they're so many ways to connect.

Hope's years of experience included teaching overseas and within the United States. She had been part of many collaborative efforts and spoke of the benefits of having a base of knowledge that can be shared with one another. She began participation in Classroom 2.0 and Flat Connections when she returned to the United States and quickly found that her

immersion in these communities made the camaraderie aspect of collaboration real. She explained:

> You don’t want to feel alone so it’s nice when you can connect and get help from another teacher and say, Yeah, I had trouble with that too. I tried it and there were some glitches. I’m glad it wasn't just me experiencing the glitches.

The 25 year veteran continued:

> The online league of teachers that you get to work with is fantastic! They know where you're coming from, what you’re doing, have ideas for you. It’s like this group of friends that you can bounce ideas off of. That part of it is really great.

As she recalled the advantages of her collaborative experiences, she inferred those ideas to the comprehensive work of students. She detailed:

> I have loved the collaboration with other teachers. Its nice feeling like there is someone to talk to who is doing the same things you are doing so you don’t feel quite so alone. I feel that it is important for our kids, too. They need to learn to think outside of themselves and work outside of their walls because that’s going to be the world that they live in.

Iris described Flat Connections as something that had inspired her, encouraged her, and enlightened her on the different ways to collaborate. “All it takes is a little support in learning that way, collaboratively.” As a 6th year teacher, Eliza was an advocate for shared learning yet recognized that she did not collaborate as much as she should have

early in her career. She joined Flat Connections during her 2nd year of teaching and subsequently utilized her learning networks for collaboration.

Despite inexperience or lack of knowledge, educators welcomed an open platform for knowledge building. Grace, a Classroom 2.0 member, seemed disconnected from principles of this practice. When asked about collaboration in her school she replied, "I am not quite sure what you mean by collaboration. I mean I needed to collaborate with other teachers because I work alone. But for collaboration within the school I didn't really need anything for that." The other eight participants held educational theories that were commensurate with the pedagogies of online learning communities. Abby condensed this idea and expressed, I am a very passionate believer in collaboration. The Ning groups do offer resources to find like-minded educators to work with. Diana had been a member of Flat Connections for 4 years. Her statements regarding her conviction in collaborative practice made her perspectives clear. She asserted:

> You know collaboration is where the learning happens and that's true for students and teachers. I open up a newspaper, I read a magazine article even about the private sector, and it's all about collaboration. That's where the true success comes in, the merging of ideas and the sharing of information.

Self-initiating learners possess tenacity in their acquisition of knowledge. Despite any conflicting beliefs, they were open to receiving new information while still pursuing their own goals. This responsive approach of giving and receiving though collaborative actions contributed to their increasing knowledge and continued learning. Through their

involvement in communities of practice, collaboration was the groundwork for the distribution of ideas and sharing of knowledge. Educators' displayed wisdom and awareness on the merits of collaboration and its benefit for all participants.

Life-long learning. The most experienced teacher recognizes that every interaction is a learning opportunity, which supplies a distinct growth opportunity to assist teaching and students in reaching a rewarding future. The continued pursuit of knowledge can promote career longevity as the modernizations in education continually improve. "I am still a work in progress but I guess an old dog can still learn new tricks," said Beth. Teachers in this research study held strong convictions about establishing sound educational conventions. Even Grace, who resisted using Nings, had her own style of researching new ideas. As well, Carla found several technologies and lesson designs that she pursued in order to share with her colleagues. Eliza's matching philosophy confirmed for her the underpinning strength of technology for continued learning.

> I was once that person to go online and search for answers knowing that there are wrong answers out there and right answers. But also, I am now reading a lot of books because there is so much information out there that is interesting and I think it's helped my love of learning. I know my love of learning has always been there. So, philosophically you can learn almost anything in our days.

Similarly, Carla recalled her deep-rooted educational approaches as she continued her professional pursuits. With only 6 years teaching, she ventured for an advanced level of education. She sought to earn a provisional teaching license and found the program to

lack rigor. Her self-assurance using technology allowed her to compensate for the lacking skills which reaffirmed her views on the power of technology to learn.

> I don't know that was changed by Classroom 2.0 I think just in general being a tech person and having to use technology every day, that's how you learn. If I ran into a problem I didn't go look it up, I went to the web to find my answers. I guess it reaffirmed for me that's the way I do it. There were so many things I did not have in college and I forget a lot of the terminology. I'm always looking on different sites, whether it's Classroom 2.0 or doing a web search to find information that will help me understand what I'm trying to do since I didn't go didn't go that normal route (educationally).

Likewise, Eliza's zest for lifelong scholarship included using technology within her Flat Connections community to discuss the plethora of resources available to teachers at any level. She goes on to detail some opportunities for bridging gaps which facilitated ongoing learning through her communities.

> I'm on Twitter and have lots of colleagues in global connections groups through Flat Connections. I use that a lot to connect with people. I think they're just so many different ways and opportunities out there for us to connect. I'm usually the one to tell people, "If you're really interested Flat Connections gave me a huge jumpstart on collaborating." I learned so much every time I did a project. I became a project manager and also learned so much from other people. We were

> all coming up with lots of different ideas and most of the people are sharers and we want to share.

As Felix "jumps in with both feet" he is engaged in Flat Connections and continuously sought learning opportunities for his students. His passion for creating lifelong learners was evident throughout the interview. He discussed the need for less restrictions regarding student technology use in his school. He said "We have other academies that might have issues and need tight watching. Fortunately, we haven't had too many issues." While he understood the inclinations of junior high school students he still fought for the chance to expose his students to real world opportunities. He shared his beliefs in reference to the liberal use of technology in schools.

> These are still 14 to 16 year olds who challenge everything and want to know more. I know they still need supervision and direction. But that's what we want isn't it? That's what I was pushing for, opening things up. We can't teach them how to do things and how to be careful when we say, sorry you can't go there.

The impetus to be part of a community, to share knowledge, and to develop skills that allow participants to continue learning makes virtual collaborative environments enticing. Beth expressed this connectivity as gold. Her efforts investing in her lifelong skills were challenged as evidenced through the following web page design experience.

> After playing with the site and creating my page, I was ready to share my latest creation with everyone in class and the Internet. Page creation was reasonably easy to complete and navigate, so I was a bit put off when my page had to be

> approved before I was allowed to take my blog live. Like Victor Frankenstein, the toiling, tinkering, and tweaking I put into this page deserved to be shared with everyone; having to wait to bring my creation to life was an unexpected delay. This clue led me to believe I had officially moved into the "Digital Native-hood" because I wanted to see the immediacy of my creation on the World Wide Web. However, realizing the potential for problems with students, the delay made sense and the reasonable adult in me returned home. I now have a better appreciation for the stark responsibilities that come with virtual collaboration and communication.

Teachers in this study saw the range of perspectives regarding learning and education. Commitment to instructional excellence moved them to relate their beliefs on personal learning to the methods they employed with students. Participants vicariously transferred their expectations of lifelong learning to students as they recognized the value it had in their lives.

This third research question facilitated an investigation on teachers' personal views on learning. Through engagement in virtual communities of practice, educators' carefully contemplated the pedagogical designs of online learning and collaboration and absorbed new ideas to add to their instructional repertoire. Confirmation of strong teaching practices sufficed educators to know that their professional skills and expertise were continually developing. Teachers' beliefs on personal learning contributed to their positive engagement in virtual communities. By virtue of their desire to immerse

themselves in this learning environment their prior educational philosophies were validated which reinforced effective practices.

Expanded Knowledge: Continued Learning, Reframed Beliefs, Reflection

Eight of the nine participants thrived in a connected virtual environment as they broadened their views on teaching pedagogy. Schreck (2009) believed that the "transformation comes more from pursuing profound questions than seeking practical answers. The struggle with the complex realities is the solution rather than a search for the right answer" (p. 114). In the pursuit of meaningful applications it was necessary for these instructors to temporarily suspend their currently held viewpoints in order to reframe and assimilate new conceptual frameworks.

Experienced educators recognized the importance of continued learning. This was embodied by teachers' persistence to learn more each day. Open-mindedness made introspection part of the learning process as participants expanded their knowledge by reframing their original pedagogies to meet 21st century systems. Through participation in communities of practice the teachers were exposed to contemporary tools and practices which enabled them to stretch their thinking and reexamine their perspectives as they considered new instructional pedagogies.

Continued learning. In order to expand their instructional repertoire it was essential that the teachers take calculated risks in order to yield high payback. Beth pointed out the need for broader and more inclusive learning paradigms when she stated, we don't live in a vacuum. She added:

> It's like that saying if the mountain won't come to you, then you'll have to go to the mountain. If they can't get to the Smithsonian in Washington, D.C., why not bring Washington, D.C. to them? Teach them that they can go out and find things by leaving the comfort of their couch. I don't know if my whole philosophy is that this is the way to get kids exposure to the world around them but for me, it's a start.

Even though she was distantly located in a rural, Australian community, with poor Internet connectivity, Iris pursued knowledge in every form. The following was her approach to extending her spectrum of resources as she continually learned from others.

> I keep up to date with blogs and posts of high interest. This is a challenge in a busy teaching schedule. However, I like to read the blogs of innovative educators, for example, Vicki Davis, Julie Lindsay, Andrew Douch, and Edna Sackville. I also review the nominees and shortlisted blogs each year in the Edublogs Awards, and Free Technology for Teachers and any links/suggestions that catch my eye from my Twitter feed. Another priority is to visit the blogs of people who regularly comment on my blog posts. For example, Ellen from Mexico, who individually and often against all odds is using technology with her university students and Sebastian Pankal from India who is achieving great outcomes in a country where technology is not readily available to all.

Beth and Iris typified teachers who were willing to work outside of their comfort zones in order to benefit from the knowledge of other teachers and experts in their field. Similarly,

Felix and Abby demonstrated the desire to participate in dynamic global enterprises. Felix emphasized how he wanted to help others by being a catalyst for change.

> I am always trying new techniques, always trying things that didn't exist when I started teaching and when we started Flat Connections activities. I'm always trying new things, bringing in new things, showing new things, and trying to get them interested in new things.

Abby highlighted her personal strategies for staying connected to a global community. She determined that her online presence and web profile allowed others to locate her and from those links opportunities arose.

> I'm more the self-guided person and like to learn at my own pace. So I'm more self-driven in my selections. When I see something that is valuable I latch onto it and learn more. I think that through Twitter I will start to follow blogs and find people to collaborate with. I joined Classroom 2.0 and I met some other colleagues. A teacher from Argentina and I started communicating and that is how I found this hero project on Classroom 2.0. I guess by completing my online profile I communicated my passions and interests and people found me.

These educators demonstrated how a focus on continued learning propagated multiple opportunities and dimensions from which to learn. These results brought clarity to Research Question 3's inquiry on personal learning beliefs and virtual community engagement. Through self-initiated approaches exposure to innovative techniques

increased the range and scope of learning prospects. Reflection on ideology contributed to the expansion of teacher theories on learning.

Reframed beliefs. The process of learning communities evolves as members interact, do things together, negotiate new meaning, and learn from each other (Wenger, 1998). Eliza recognized the negotiation necessary when engaging multiple learners. She shared "I think there's always that give-and-take where you're working with a bunch of people who have different ideas." She continued by identifying varying beliefs about technology within her group and wrestled with professional dogmas she felt were all too common.

> I was in a community where a teacher didn't think we should be doing so much on technology. I said it was a global project and the way we are connecting the kids is through technology. But they really want to hold onto some of those things like mailing letters which again there is a need for sometimes but when you're in school you want that fast connection. Let's say we were reading the same book, a letter is going to take longer to get there and by then we'd be on a different chapter of the book. You can't have discussions over snail mail. You have to use technology to connect and do some of the things that we have done. I think we can see learning getting better and better with the use of technology when we do that.

For Beth, technology came naturally. She felt empowered to reframe her philosophies on learning in order to maximize the potential of PLNs and collaborative communities. "I

was used to working with other people and kicking ideas around" she added, so this (participating in Classroom 2.0) was an extension of that. But now, I wasn't just collaborating with my colleagues in the class I was also actually sharing information that I was learning. This English teacher continued;

> I have a professional learning community (at my grade level) where we meet once a week to kick ideas around and do some collaborative planning for where we're headed with our classes. As we do this is, we talk and jot down ideas just like it's always been done. Now my two cents to the group is get them to use technology more. So we've done some Google hangouts when were away from the office because we can all get to that drive so it's a little nicer to do things that way. We also do chats and conversations on Facebook. We were all members of the same community. I think it's just strategies more than anything else; coming up with an idea and shooting it back to them and getting feedback.

When asked if his participation in Flat Connections changed his belief about collaborative meetings with other teachers Felix replied**,** "No, I don't think so." He added:

> I've always believed that it (collaboration) was key and important for the future of the world even before I started with Flat Connections. So, I wouldn't say my beliefs have changed but I am glad that I found this community to work with. I've learned a lot more and stretched myself a lot further because I have this community of people to work with.

Diana contributed an analogous perspective on collaboration and networking.

> It (Flat Connections) always introduces me to new tools to try. A lot of what I do now is online regarding collaboration with students. It gives them an opportunity to go beyond the classroom and to know about those tools, experiment with them, and try them all out. These are the ideas I have learned by being a part of this network.

These narratives include the recurring theme of teachers' openness for scholarship. None shied away from unfamiliar scenarios instead they used these situations as opportunities for learning. Educators easily incorporated these different dimensions into their already held personal beliefs on learning.

Reflection. The effects of a robust community can be palpable. This effect can sometimes be vividly apparent while other times realization develops from deep introspection. Participants Beth and Felix described how their virtual communities permitted a reframing of their original views. Beth looked back on her transformation,

> I recognized that my initial belief about group work was very negative and now it's not. I know that that give-and-take doesn't have to be face-to-face with my colleagues, I can do it electronically. I think it is almost a little bit better because it gives you that opportunity to pause and think before you speak. I think it does make some changes. I'm taking those tools and introducing them in very small doses not just to my colleagues but to my students. Nobody in our school does this kind of work so it is foreign to them all.

Conversely, even though Felix would say his beliefs about communication were not changed by participation in Flat Connections, he recognized that the number and value of connections he made in Flat Connections were of better quality. “I wasn’t a digital hermit but it certainly has opened up the world to me and my students.” This was a sentiment expressed by many of the teacher participants.

Diana’s family plans and travel schedule made it difficult to schedule the follow-up interview. We finally connected while she was at the International Society for Technology Education (ISTE) convention in Atlanta, Georgia. When asked to think upon her overall experiences in Flat Connections and isolate some of her most memorable encounters she shared the following anecdote.

> I just had this very discussion in one of the breakout sessions at Unplugged. There was a Board member who had come from Virginia. The topic of our break out session was on global collaboration and online relationships developing. He questioned these virtual relationships and asked how valuable can they…and he used the word “fake relationships.” You could feel those who had collaborated globally take a deep breath. I was really caught off guard but did have enough in me to say we are all learning together and actually, we are establishing some of the most amazing relationships we have ever had professionally and learning the most we ever have. …you can have a very valuable and authentic and close relationship with someone online that you technically have never been physically next to. When questioned on one of the foundational principles of virtual learning

> communities, Diana's leadership prompted her to emphasize the meaning relationships had on successful practice.

Through her narrative it was clear that Diana was eager and open to new possibilities. Still a learner, she reflected on her own perspectives humanized her comments when she said, "Everybody gets a little nervous taking that risk but the more I use it the more comfortable." She went on to add:

> I can understand what he was saying, though. He was a little older and hadn't really caught on to the movement. He was still thinking in old terms. He said for him having a relationships means sitting down and having a cup of coffee with a friend and talking. He said "when you're doing this by blogging or online communication, what kind of relationship could that be?" Then, we had a conversation about how incredibly valuable those relationships could be. I wouldn't have learned half of the things I know had I not been part of those virtual communities.

Wenger (1998) wrote that communities of practice are not only a context for the learning of newcomers but also, and for the same reasons, a context for new insights to be transformed (p. 214). As Beth thought upon the changes she experienced throughout her engagement in Classroom 2.0 and the personalization of her networks, she tried to encapsulate the phenomena. She then made this terse statement, "I really like it (PLNs) because it's something that is important to me. There's sort of a variety but specificity if

that makes sense. It's sort of like big and small at the same time." The magnitude of possibilities was hard to put into words.

Generated Understandings: Personal Growth, Professional Growth, Realizations

Learning is at the heart of personal change and transformation, and the learner must be willing to take risks and deal with changing situations in his or her environment (Wenger et al., 2009). Through the comprehensive analysis conducted in this research it was apparent that each of these participants had personally evolved on some level. Eliza believed that there were a lot of opportunities to be learning and having her eyes opened to taking those risks of doing and learning things differently because things change. These enlightened moments facilitated an outward appreciation for the manifested growth that occurred. Felix changed by allowing more student exploration and discovery rather than giving detailed directions before each lesson. Beth noted a positive transformation of her beliefs on collaboration.

Many new concepts and philosophies were represented through the diversity of members of both Classroom 2.0 and Flat Connections. Through collaboration and participation educators developed a new awareness of their already held beliefs on learning. Recognition and reflection on these fresh perspectives gave the teachers alternative opportunities from which to improve their instructional pedagogy. The teachers selectively utilized these learning prospects to advance themselves personally and professionally.

Schreck (2009) specified that in order to advance personal or professional knowledge, the subjective nature of learning requires awareness of one's strengths and weaknesses. Participatory learning in this study was found to involve an assertive approach for information acquisition. Examples of this evolution will be discussed in the personal growth section. Brown and Ellison (1991) described active learning as stimulating students so that they develop habits that make them think about how as well as why they are learning and to increasingly take responsibility for their own education (p. 94-95). The premise of personal accountability for knowledge development may be one of the most powerful concepts regarding individual growth.

Personal growth. While the changes were subtle in some and pronounced in others, participants found specific areas in which they felt they needed to develop. Beth's renewed ideas were in the area of collaboration. She associated her personal growth with a situation she went through many years ago. She realized:

> I think it does it change my attitude about group work. Several teachers are of the same mentality where we don't do group work because we end up doing all the work ourselves. This (Flat Connections) truly changes the face of group work and gives me a good model for later on if I chose to do something collaborative like this with my students.

Felix recognized his change in practice when introducing a new topic. He disregarded his personal inclination to control situations, and encouraged exploratory learning for students. He shared:

> I've always had the students explore wikis, for example. Since starting with Flat Connections I have an early semester project where students teach their peers about a topic and then they use a wiki to work with each other. They use a wiki to build a reference for other students on their topic. Previously, I would have shown them a wiki or explored playing with a wiki. Flat Connections encouraged me to change (doing it this way) which changed my entire course. I've moved from quizzes and tests to doing as many real-life based activities as possible.

The use of authentic activities creates a more engaging and interesting learning setting. The caveat, as Eliza explained, is ensuring that the authentic undertaking has merit. As she looked back on a recent activity she recognized its shortcomings. Eliza's personal views on learning made it difficult for her to reconcile the scenario. She described a lesson in which her students used Skype to collaborate with students from California.

> It's (Skype) a real basic and simple way to get teachers to use more technology in the class. It's a one-time shot. You don't have to do a lot of planning. You also don't have to do anything afterwards so; this one-time experience becomes very shallow. You're not doing anything with it, you're not adding it into the curriculum, and you're not getting these kids to really think about what they're learning.

Likewise, through Diana's acknowledgment of her superficial participation in her virtual group she was resolute in changing. Wenger et al. (2009) called this type of participation peripherality. While better than no participation it provided "an approximation of full

participation that gives exposure to actual practice" (p. 100). This pseudo engagement created safety for the participants but provided no opportunities for risk taking.

> Six years ago I would have called myself a lurker. I would go to a blog or get into these online meetings but I would just watch, not participate. To me, that's a bit of an intimidating environment because it was uncomfortable. Not having the face-to-face was just weird to me at first. It was something I had to adjust to. As I started involving myself with Flat Connections I started having more and more online meetings I got so much more comfortable with it. You contribute, you add, you get on videos, add to the audio, you throw something in an online chat, and the more you do that, I think, the more comfortable you feel. Previously, I noted that the new teachers that came into the global projects tended to be inconsistent in participation. They tended to be quiet in online meetings. Now, I get it because that was me once. I find that tends to be an uncomfortable situation until you actually do it. Using personal experience as a lens to examine practice created a unique viewpoint which Diana utilized to help others grow.

Professional growth. For growth to occur, whether on the personal or professional level, the learner must be agreeable and give consideration to new possibilities. Beth relayed how she had to strategically approach her colleagues to convince them of the importance of using educational technology.

> My two cents to my PLC at school is to bring technology tools in small baby steps just so that I'm not overwhelming them because it can be overwhelming. But this

> is a kinder, gentler approach to using technology in collaborative ways. This way I'm more likely to get the buy-in from my colleagues.

As a master teacher, Eliza vocally compared traditional communication with a new model. She seemed to weigh the possibilities of both meaningful forms of collaboration. While both were decidedly useful, she seemed to put an emphasis on the latter.

> I think it is (learning environments) changing and it's going to continue to change. I think for me there is still a whole lot of value in being face-to-face with person. But I think that there are some things we do that don't need to be face-to-face. We can be learning online with our peers and possibly people who may become better peers to you than people who might be geographically closer to you.

Professional awareness can supply a distinct growth opportunity that can assist in a rewarding future. Accomplished educators find nuances for learning in every exchange. Beth reexamined her work and admitted through her own example that the benefits of professional learning are reaped by her and her students as well.

> I have come to learn that knowing where I want my students to go and what I want them to take away from my lessons makes my lesson plans much easier to produce. Reminding myself (and my students) what the goal is for any given lessons has it benefits; using the tools I have learned through Classroom 2.0 makes it all worthwhile. I am still a work in progress but I guess an old dog can still learn new tricks.

The inclination to participate in opportunities for professional growth seems to reside in those who are open to change. These potential growth sessions seemed incongruous to the beliefs of Grace, the teacher with divergent ideas. Again, we mention that even though comprehensions of the advantage of connected learning were absent, she was still attached to traditional practices. She said;

> I would rather go to a professional development session (that is planned) than go to a webinar. I'm not saying that I haven't done both but I haven't really found anyone worthy of collaborating with. Also, I haven't really found any group that I got something specific from.

As a library and technology specialist, Grace's span of influence was extensive. Her engagement in out-of-date methodologies minimized the capacity for tremendous effects within her school. Her continued professional exposure to contemporary devices and practices may present a host of new opportunities from which she and others can learn.

Realizations. Changing personal beliefs, educational pedagogy, and instructional practice does not happen quickly or without a person spending some time reflecting. Insight and flexibility are necessary aspects for a person open to changing. As Carla stated, "If you're talking about the last 7 or 8 years (time as part of virtual learning environment), my beliefs are still the same. If you're talking about before then, they have changed drastically." Beth articulated that this change required a teacher who was

motivated, open-minded, and eager to try something out of the ordinary. Diana provided this example to demonstrate her eagerness to learn.

> Before I got involved with Julie Lindsay I participated in another virtual personal learning community, 6 years ago. We learned to use Skype, Diigo, and blogging. I have not ventured anymore into that. I had not brought it into my teaching and it was not part of my personal life. I had not immersed myself in any of that. They talked about how valuable these tools were to teaching. I really began to see some things that I was not aware of before. I decided that I needed to make more of an effort to use these tools and once I did I began feeling more comfortable with it.

Personal attempts to engage in community using new found skills along with technological endeavors can be daunting. Though others may quickly tout the advantages of certain applications and devices, Eliza uses the word “skeptic” when presented with a popular new tool that she had not evaluated. She gave this example:

> After investigating virtual reality environments, simulations, and tours on conducting research on what the experts have to say about virtual reality in education, I have to say that I have changed my mind about the use, effectiveness, and purpose of virtual reality in education.

Beth went through a similar transformation when she evaluated various sites and applications. She promptly realized that she needed to take small steps as she grew. She stated:

> I'm not a complete convert yet however, I can see the value and effectiveness virtual reality sites, applications, and simulations bring to students in the name of convenience, cost, and curriculum. The secret, I think and have learned, is to strike a balance between what happens in a traditional classroom with doing nontraditional activities.

As the teachers prepare students for required assessments, there are challenges to becoming well versed in multiple fields of practice. Abby shared her observation when she stated, we can't do nearly as well in isolation. Collaboration is where the learning happens, that's where the true success comes in, the merging of ideas and the sharing of information.

Virtual learning communities, such as Classroom 2.0 and Flat Connections, offer potential relationships with colleagues and propose resources that were once far beyond a teacher's reach. For Abby, joining PLNs added to her teaching practice and strengthened it. It's a good place to start, find resources, or follow and get to know people in your field. Beth's PLN supplied tools that enabled her make bold change like including a social bookmarking page for students to keep all their research materials organized and in one place. This spilled over into their research reports.

> We are currently in the midst of teaching a Career Research Paper to our 10th grade students and I am already beginning to see that when I teach this research paper next year, a couple of things need to change. We need to stop writing on note cards and move to digital note-taking. My process needs to be

> more solidly in place before we begin the lessons. I know I need to incorporate more purposeful planning with a stronger focus for a more authentic learning experience.

Beth continued and shared this analogy to express how she moved through her PLN shopping for worthy endeavors.

> It’s kind of like going to the grocery store and saying I'm hungry but I don't really know what I want to eat. When you get there, you think, that looks good. I'll try that thing that looked really good. I may try that again if it’s like the first experience. I'm sort of shopping around and looking to see what's out there and finding something that I need or am intrigued by. I usually learn something new or get information on something that I just didn't know about before.

The benefits of participation in connected virtual communities of practice and engaging in established social networks are boundless. Growth can be represented through modified personal beliefs, reevaluated professional ideologies, and improved pedagogy. Diana confidently felt that she personified the positive evolution she experienced from participating in online learning communities.

> I’m a stronger teacher for it. I think I have so much more to offer my students by being part of Flat Connections network. I am far more comfortable in my teaching. I'm much more comfortable taking risks and I'm much more comfortable with not being the one who knows it all, the one with all of the information. I have finally taken on a role where I’m there to mentor and guide.

Reforming solidly established beliefs is a challenge often left with fruitless results. As professionals, educators have traversed the ebb and flow of countless educational pedagogy. While firmly held principles on personal learning were factors in teacher engagement in virtual communities, the transformation rested on the understanding that "we are now creating knowledge together, testing theories and ideas, collaborating on solutions or actions, and sharing back most everything we learn in the process" (Schreck, 2009, p. 23). This notion recognized that those who have evolved over time…have shifted important attitudes and practices as a result of the reframing of what they do (Schreck, 2009, p. 137). Newly established understandings on communities of practice and personalized networks for learning brought these teachers to the forefront of present instructional approaches to learning. Teachers' reframed beliefs may result in the modernization of practices that are more commensurate with contemporary ideologies.

Summary of Findings by Research Question

Research Question 1: Enhanced Teaching

The research findings confirmed that teaching was enhanced through participation in virtual communities of practice and the connections made within personal learning networks. PLNs, technology tools, and task restructuring were the main categories found under Research Question 1. As members of Classroom 2.0 or Flat Connections, teachers became confident managers of PLNs for professional development and were self-directing in their processes creating digital collegial connections for support. Participants found relevance in their measures of sharing passions with like-minded colleagues and the collaborations that developed from those interactions.

Personal and professional factors prompted eight of the participants in this study to utilize progressive learning tools such as Skype, Nings, and Twitter. They modeled exemplary collaborative practices and were catalysts for change within their schools. These experienced teachers became advocates for connected communication and provided individual, small group, and large group teacher training opportunities. While teachers' preexistent personal philosophies were not altered by their participation in these virtual communities, they recognized that technology was the vehicle by which they could extend learning beyond classroom walls, and as Iris stated, "Become powerfully connected globally."

Preparation and flexibility were characteristic of these communities as unforeseen situations arose often. The teachers spoke of the overwhelming realities of the classroom

and credited their use of digital technology as an invaluable tool in facilitating the organization of themselves and their students. The reciprocal efforts of the teachers reduced the duplication of work which made time for other creative ventures to take place. Sharing resources and working knowledge increased productivity among the teacher participants.

Research Question 2: Collaboration

The interest to learn and contribute within virtual communities of practice augmented the teachers' potential to refine their instructional practices and enabled them to communicate with experts and educational practitioners on a global platform. The accessibility of resources exponentially expanded through this digital interface as teachers and students engaged in authentic connections. An and Reigeluth (2012) stated that as students work collaboratively to create new knowledge, authentic learning experiences help them develop real-world skills, such as collaboration, critical thinking and decision-making skills. This pooling of varied experiences and knowledge resulted in specialized collaborative environments. Learning first-hand challenged the teachers' educational pedagogies as well as their backgrounds on how they teach and learn bringing perspective to these digital engagements.

The allocation of vital information and educational achievements gives each school an identity worthy of being shared. Community stakeholders such as families and business leaders can then see the changes made possible through their support. Transparency in practice and policy were foundational for each organization. While the

use of reformist technology practices had positive learning outcomes, the teachers expressed that the safety and value of this progressive educational technique must be clearly communicated to parents and local community stakeholders. The teachers used newfound digital devices to ensure clear communication which assuaged parental fears and reassured the community about any uncertainties they might have. Teacher and student use of collaborative pedagogical practices reduced the generational gap between adults and students, opening new opportunities for learning. Meaningful learning can develop at the realization of personally meaningful and educationally worthwhile learning outcomes (Wenger, 1998). This approach showed how the development of both teachers and students can grow immensely.

Social networking is a term commonly utilized and understood by the millennial generation. Tapscott (2009) called them the NetGen and stated that they are incredibly flexible, adaptable in their thinking, and very multimedia savvy (p. 98). This research found that once the teacher participants had positive experiences within online communities they were more likely to continue their digital learning endeavors. As teachers participated and gained skills using "social and participatory technologies" (Conole, Galley, & Culver, 2011, p.120), like Facebook, Skype, and Twitter, they recognized the potential of networked environments. Eliza described social networking as the "when-needed and when-time-allowed capacity to access resources and to interact with each other at their own pace." The social network concept became demystified as teachers developed new understandings and took control over their learning.

Research Question 3: Personal Learning

Personal philosophies are typically determined early in a career and tend to remain the same over time. This key factor played a significant role in teachers' engagement in virtual communities of practice. Participants were resolute in their beliefs about learning which inclined some to resist the prospect for growth. Participants ranged in age from 42-62 years and had between 6-35 years of teaching experience. All had essential technology roles in their buildings. While they were open to the full immersion learning process common in both Classroom 2.0 and Flat Connections, their ideas on learning were not greatly impacted. Most felt membership in these communities reinforced their preexisting ideas on learning and as Abby stated that participation in Classroom 2.0 strengthened her beliefs. Collaborative practices were the norm for most all of these teachers. Felix noted that he had been a longtime collaborator, but Flat Connections gave him richer experiences in which to work. Before these teachers entered the virtual learning environments, they held established ideas that were similar to many of the principles of Classroom 2.0 and Flat Connections.

The data from Research Question 3 established that these participants thrived at being life-long learners. Eliza mentioned that regardless of her participation in the Flat Connections or as a project manager, she learned something new every time she was engaged using technology. Exploration of innovative practices and techniques were made possible by the teachers' pursuit of meaningful learning. Hope recalled being given a technology tool she had never used before and through her perseverance, figured it out.

While participants' beliefs did not markedly change, they did respond that they were able to extend their learning and ideas about certain topics. Abby shared, "Classroom 2.0 also had webinars and presentations so, just having that other entity in Classroom 2.0 was great and it expanded the area of things you can learn from." These participants recognized many of the opportunities provided to them through their engagement within these virtual communities of practice.

While eight of the nine participants utilized the inventive methods of teaching and learning offered through their participation in these virtual communities, there was no suggestion that teachers moved beyond what was presented. Some of the participants began their community of practice experience through an outside influence while others were required to join a community for a university course. Regardless of the manner in which they began their participation, teachers did not indicate that their engagement inspired them to branch off independently to find distinctive experiences. They were highly engaged in new opportunities and used the term "inspired" to describe their motivation to continue using the tools they experienced during their practice in their learning communities.

The teachers eagerly utilized the opportunities that were made available through Classroom 2.0 and Flat Connections. They identified these learning environments as enlightening, it opened their eyes to things they had never heard of or knew existed. Felix, with his zeal for technology, articulated that he has been trying things that didn't exist when he started teaching and when he started Flat Connection activities. Even

Anne, a veteran with 27 years' teaching experience, learned a lesson in cultural beliefs from an encounter she experienced via Skype. The teachers' journeys in these learning environments were their keystones of learning and professional growth. In order for students to grow, so must teachers. Wenger et al. (2009) stated that "while people think and work differently, they should all be focused on the same audacious goal, to contribute to the world's capacity to learn" (p. xii). Educators in this research study epitomized progressiveness through their desire to expand their knowledge through their virtual community learning experiences.

Interpretation of findings, limitations of the study, recommendations, and implications for social change are discussed in Chapter 5. Concluding remarks highlight the core of the research. Suggestions for future research are included in the final section.

Chapter 5: Discussion, Conclusions, Recommendations

The purpose of this qualitative case study was to examine how teaching was enhanced through participation in communities of practice and to analyze how teachers' beliefs on personal learning and collegial collaboration impacted this membership. Communities of practice and personalized learning networks were evaluated to determine their bearing on enhanced instructional strategies, which included integrated educational technology practices. I found that individual teacher's values on learning and working partnerships influenced teachers' engagement within virtual communities of practice. This supports Fazio's (2009) findings on the individual and social development of study participants engaged in collaborative communities of practice. Fazio stated that the relationship between participants' abilities and experiences can "propel their personal and professional growth" (p. 104). Relationships established through social networks and reciprocally beneficial collaboration furthered instructional practices to reflect 21st century principles.

This qualitative case study was an exploration of the evolving field of educational growth and professional development as balanced by pedagogical beliefs. Results contributed to the transformative practices in the field of online teacher learning communities through an understanding of teacher proclivities for knowledge and collaboration. Semi structured questions and analysis of teachers' contributions to digital Nings presented data that were coded and reviewed by themes that emerged from the analysis. Clarity was provided on teachers' beliefs that influenced their engagement in

virtual opportunities for continued learning. In the data collected, I was able to determine how closely teachers' beliefs were associated to their integration and use of technology as a learning device.

This study provided a glimpse into how nine purposefully chosen teachers who engaged in virtual learning communities restructured their academic and personal philosophies on collaboration and learning as a result of their participation in communities of practice. Meaningful connections made within personal learning networks influenced technology integration into instructional methods subsequent to participation. The participants emphasized teachers' relationships with learning, collaboration, and technology implementation that were directly connected to their preexisting pedagogical views. Teachers' beliefs about their learning were well established before they entered their classrooms and did not change during or after participation in virtual learning communities. For some participants, while their conceptions on building communities for learning broadened through their engagement in the Classroom 2.0 and Flat Connections, their views on teaching remained consistent.

Interpretation of the Findings

Researchers have described the efficacy of virtual communities of practice as settings for teacher learning and professional development. The need for relevant professional learning and time to reframe beliefs and practices emerged from my investigation as the most prominent areas of concern for teachers. Darling-Hammond et al. (2009) stated that professional communities are most effective when teachers are

involved in the educational decision making and have regular blocks of time for teachers to collaborate. A self-directed personal learning method (Melville & Yaxley, 2009) is preferred by teachers and allows them to feel connected to the entire team (Wenger et al., 2002). Virtual communities of practice provide a platform for dialogue that opens teachers' minds to different perspectives and ideas which was supported by my findings on teachers' reported expanded knowledge.

Huggins et al. (2011) emphasized that stakeholders and leaders need to nurture these virtual learning environments for success while Maloney and Konza (2011) prescribed a time for teachers to reframe their beliefs and practices. My research outcomes were in line with Huggins et al.'s (2011) and Maloney and Konza's (2011) findings on the need for backing from stakeholders and ample time for restructured practices. A joint effort from stakeholders, leaders, and educators increases the possibilities of successful environments and practices to occur.

Maloney and Konza (2011) examined the outcomes resulting from differences in philosophical principles within communities of practice. Maloney and Konza found that some teachers refrained from voicing their opinions due to a lack of confidence or fear of causing discord within the group. Teachers in self-contained, self-supporting classrooms hold personal beliefs that are not regularly challenged, and by not having to conform to group practices, they are able to maintain their deep-rooted ideas. My research refuted this finding as four out of the nine teacher participants held positions in which they worked independently and were not connected to a specific grade level or teacher team.

Despite the lack of direct associations, three of these educators, Abby, Hope, and Iris, developed relationships through their virtual community interactions. Their work environments did not facilitate professional networks, so they established virtual connections which thrust them from isolation. This was especially true for Iris, who lived and worked in a rural Australian community yet made some of the richest collaborative experiences for her students.

Slatter and France (2010) determined that teachers' beliefs had an influence over who had control in educational situations. Slatter and France used the term *locus of control* to describe the fluctuating transfer of power between teacher and student interactions. The position of teachers' beliefs along a continuum represents their ability to share or relinquish this locus of control. Positioned on one end of the continuum are teacher beliefs that result in learning situations that are designed and delivered by teachers. The center of the continuum denotes teachers' beliefs and willingness to distribute control and utilize community members as educators. On the other end of the continuum are students who seek open-ended learning experiences. As the locus of control is shifted to them, they take on leadership roles that influence their learning experiences. Through my research, two more nodes added before and after the center position of this continuum may extend knowledge in the field of educational technology.

In addition to the three existing continuum nodes, teacher-led experiences, communities of practice within reach for teachers and learners, and student-driven learning, a fourth and fifth node could be added along the scale as seen in Figure 5. These

new nodes are positioned as the second and fourth nodes. The second node would provide a transitional step from solely teacher-designed activities to include continuing teacher professional development, cooperative influences using strengths of community of practice engagement, and collaborative practice experiences. Through firsthand practice, this step would drive teachers to move from a controlled style of instruction towards an exploratory instructional approach that offers respectful student tasks. The fourth node placed after the middle node would offer a level that considers student needs and integrated student interests. This step would empower students to take responsibility for their learning through authentic experiences steeped in 21st century applications.

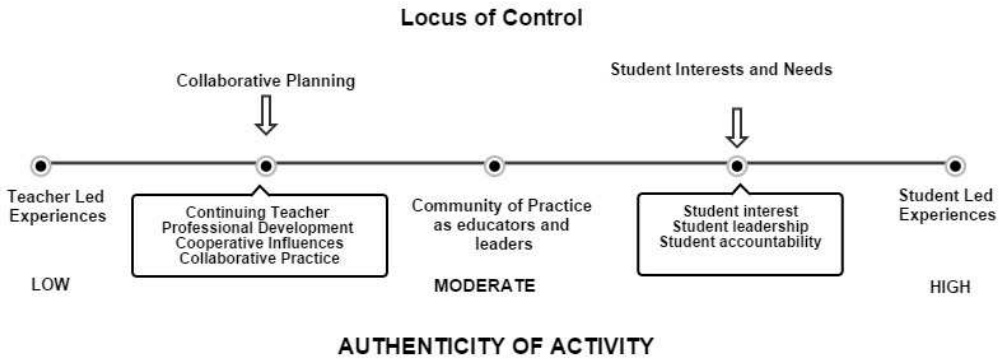


Figure 5. Locus of control

I examined the influence that teachers' personal learning pedagogies had on their engagement within virtual learning communities of practice. Due to the nature of their open-ended and collaborative nature, the Classroom 2.0 and Flat Connections communities provided an excellent setting for this investigation. I determined that teachers' established ideas about their learning and collaboration became intertwined with their virtual practice. Teachers' prior knowledge was not a drawback to their participation, nor did it change their views. Educators were introduced to techniques and concepts they readily adopted and used to create flexible learning environments that extended their knowledge development beyond classroom walls. The teachers pointed to the direct advantages of this new learning, which included innovative instructional strategies such as global collaborations and teacher networking. Wenger (1998) wrote, "The transformative practice of a learning community offers an ideal context for developing new understandings because the community sustains change as part of an identity of participation" (p. 215). Teachers applied their conceptions of learning to their engagement in virtual communities of practice.

The outcomes presented personalized learning networks as a means to collaborative practice that teachers utilized to develop professionally and reinforce confidence in their pedagogy. Colleagues with similar needs formed relationships and engaged in educational discourse through virtual experiences that advanced their teaching and increased professionalism. Wenger's (2002) philosophy of building sturdy units for learning played a central role in creating the relationships required for global collaboration. Robust connections were important to the integration of contemporary practices, and effective interactions resulted in mutually beneficial partnerships. Wenger et al. (2002) stated "by uniting people from different regions or countries around topics they are passionate about increases the density of the relationship between members" (p. 135-136). The teachers' collaborative interactions presented opportunities to extend their learning and fully engage with local and global colleagues.

My research identified the value of reciprocally advantageous relationships as veteran community members were intrinsically motivated to provide support for fledgling members. One of this study's participants, Felix, stated that his inspiration emerged from prior experiences in which collegial support encouraged his full participation. These professional affiliations often evolved into opportunities for teachers to take on leadership roles within various communities of practice as evidenced by the study participant who became a virtual moderator. Relationships based in community practice became positive conduits for learning and professional development.

Wenger's social learning theory provided the framework for this examination of teacher pedagogies on learning and collaboration. The general tenets of Wenger's social learning theory framed the idea that learning is a social activity that is most effective when learners engage in creating products that are personally meaningful (Wenger et al., 2002). Social learning theory emphasized that learning emerged from social interaction that can "sustain and have enough mutual engagement in pursuing an enterprise together to share some significant learning" (Wenger, 1998, p. 86). An analysis of findings of this study revealed that teachers' personal ideologies on learning stood firmly grounded and, rather than being swayed, became enriched by their participation in virtual practice. Membership in personalized learning networks through Classroom 2.0 or Flat Connections enabled the teacher participants to connect globally, using 21st century technologies, and to engage in collegial collaboration.

Relationships built with learning communities foster environments that "organize, upgrade, and distribute knowledge their members use every day" (Wenger et al., 2009, p. 76). There was evidence to support that the participant teachers' exchanges became platforms for real world interactions, collective works among teachers, and opportunities for reflection on pedagogical practices. McArdle and Coutts (2010) highlighted the importance of critical reflection in any learning setting as it joins members enabling them to create shared knowledge and work together to make change. The fellowship enjoyed by Classroom 2.0 and Flat Connections participants encouraged these collective ventures.

Wenger's et al. (2002) social learning paradigm determined that "customized communities of practice make it easier to learn and grow in" (p. 151). This research substantiated that the intention of virtual communities for learning were enriched by the communication and sharing within those groups. The social, multi-faceted learning experiences of participants highlighted Wenger's position on knowledge building through community relationships and learning through social structures. Collaboration in 21st century communities of practice provided paradigms necessary for teacher growth.

The foundational elements of communities of practice emphasized the internal dynamics of the group. Wenger (1998) identified these features as critical to the community's operational effectiveness. The results from this study provided evidence of the socialized behaviors that practitioners engaged, which Wenger identified as essential to a community's success. The social production of meaning included relationships that supported practice within communities. As these communities progress and matured their common objectives empowered them to remove barriers and engage in meaningful practice around the world (Wenger, 1998).

The educator groups used in this study represented this interaction as they harnessed technology's fluid capacity to connect them with communities and colleagues abroad which facilitated this construction of knowledge. The participant educators' worked cooperatively to overcome obstacles and create global affiliations which enriched their instructional practice and served as an opportunity for professional growth. This study on communities of practice as instruments for enhanced teaching embodied

Wenger's social learning theory as members of Classroom 2.0 and Flat Connections interacted through educational discourse, relationship building, and engagement in practice to learn.

Limitations of the Study

Yin (2009) stated that case studies focused on a single situation that may or may not be transferable to other groups. Typically, scientific facts are based on multiple iterations of an experiment in which results can be replicated (p. 15). The reproduction of research results were a study limitation as the inability to access an abundance of participants limited my study to the responses of the nine educators who replied to the invitation. I utilized several recurrences of the research data as well as an extensive analysis to expand knowledge in the field of education regarding personal perspectives towards virtual learning interactions.

The risk of bias entering the research during interviews or while examining archival data was considered and intentionally reduced. Through *insider research*, (Dwyer et al., 2009) my shared understanding of virtual community participation may have resulted in assumptions being made. Reflective journaling of my perspectives during the two interviews with each of the nine participants facilitated an impartial scrutiny of the data. Careful review of my notes brought attention to any preconceptions which were then circumvented during the second interview and subsequent Ning analyses.

The potential impact of researcher bond with participants may have also been a limitation to this research. This chance was minimized through the triangulation of the three data sets which included an initial interview, evaluation of Ning contributions, and follow-up interviews. The use of multiple sources substantiated the responses offered during the interviews (Merriam, 2009). The varied methods of data collection authenticated the results of this study.

The ability to validate study results indicating that they could be transferred to teacher involvement in any virtual professional development model was the final limitation (Yin, 2009). In this case, participation in the Classroom 2.0 and Flat Connections paradigms was examined and results of the study were specifically associated to teachers' interactions within these professional settings. Exact program features may be difficult to recreate and participant responses are uniquely individual. Attention to these limitations diminished any negative influence they had on the study.

A possible threat to validity incorporated teachers' fear of being judged as a result of their participation in the study. Educators were not identified by name in the study and pseudonyms were used to protect each participant's identity. Teachers independently chose to participate through their response to a letter of invitation posted to their community Nings. There was no penalty if they responded to the invitation and then chose not to join. The richness of the data communicates the strength of the results.

Recommendation for Research

Through varying research approaches future studies conducted on teacher beliefs on self-learning, collaboration, and participation in virtual communities of practice may enhance the field of educational technology. Initial assumptions in this study expected that teachers had an intermediate level of technology skill and could navigate within an online environment. It was assumed that teachers' previous experiences in professional development provided them with multi-leveled training in technology practices. Greater information would come from a correlational study that investigates student achievement in relation to teachers who are entering the field of education as a second career to those who have only had careers as teachers. Questions that explore the types of technology training and skills second career teachers bring with them could assist in understanding how previous exposure to technology affects levels of comfort with technology use in classrooms. Continued research on teachers' previous technological experiences may lead to the development and application of tools that informs future educational teacher programming.

My research indicated that while teachers had some level of collaborative experience it was not clear how they initially joined their communities of practice. Further research using a mixed method approach that examines if teachers were required to participate, influenced to participate, or self-driven in their actions may give insight to their level of motivation within their communities. The use of interviews and discussions with teachers, self-reports, and scale ratings could produce a comparison tool that

determines how the different initial stimulus for involvement in communities of practice reflected in their motivation and engagement. Data may reveal the relationship between the characteristics of teachers who continued engagement in these communities and those who did not.

Virtual communities of practice present differing perspectives and ideas which can change teacher beliefs about their practice (Kasi, 2010). Sang et al. (2009) stated that personal beliefs systems exert a powerful influence on teachers' curricular decision-making and instructional practices. While there is generous data on the ability of virtual learning communities to shift teachers' beliefs, little is known about when or where their beliefs are formed. Ertmer and Ottenbreit-Leftwich (2010) proposed that long-standing beliefs about teaching and learning are formed based on personal educational experiences to which Prestridge (2012) added can be resistant to change. A comprehensive mixed method study on the personal and educational backgrounds of pre-service teachers may indicate a rationale regarding the development of personal philosophies of learning. An understanding of the evolution and maturation of teachers' ideologies may provide a guide for course design in university programs.

The second assumption of this study expected results that were representative of typical conditions within virtual communities. While no study will exactly match the findings of another, sufficient, descriptive data, such as participant quotes and interviews, make transferability possible (Merriam, 2009). The results could then possibly be generalizable or transferrable to other typical virtual learning environments.

Findings from this research determined that teachers' personal beliefs about learning were not greatly impacted by their engagement in virtual learning communities. While they did benefit from social interactions and the development of personal learning networks, growth could only be demonstrated through the new interactions that lead teachers' to participate in personalized community activities. Teachers who progressed and adopted new practices only expanded as far as the most advanced person in their personal network. There were no teachers in this study who indicated that they were motivated to seek further advanced learning opportunities on their own. Their participation and growth relied on the leadership of other teacher participants. A mixed method approach using multiple techniques for data collection such as surveys, observations, and input from school leadership and stakeholders may provide a more robust assortment of data that produces a method for more accurately measuring teacher growth and motivations for learning.

Best practices in educational technology incorporate the perspectives and motivations regarding beliefs and practice, but also distinguish if the motivation is aligned with teachers' pedagogical beliefs or with their beliefs on technology. Research indicated that the value placed on the professional development task and the terms of the environment were factors in the level of teacher participation in these learning communities (Maloney & Konza, 2011). Sang et al. (2009) stated that technology integration can be enhanced or hindered by culture and context. While an understanding of factors relating to this relationship are essential in developing and strengthening these

technology rich environments, further research may distinguish if teachers' beliefs about practice can be attributed to their pedagogical views or their beliefs on technology use.

Richmond and Manokore (2010) determined that the discourse called "teacher talk" between community members and non-project colleagues enabled teachers to recognize their ability to act as change agents in their field. This commitment to becoming life-long learners promoted teacher practice during their study. Further research that investigates the influence educational discourse with non-educational organizations could provide perspective on elements for professional growth. The continued search for innovative methods for knowledge sharing reaches only as far as the next successful educational organization. An outsider perspective may provide a spark that initiates improvement by investigating effective organizational systems at work. Teacher talk through learning networks and virtual communities has not been demonstrated to motivate teachers to change practice. Successful non-educational programs have leaders that facilitate growth so an evaluation of these programs may provide a new vision for education.

Preparation and access to the correct job provisions can make a difference in motivation to engage in practice. Teachers may be inclined to participate in communities for learning, but environmental factors play a distinct role in its actualization. In the research conducted by Baker-Doyle and Yoon (2011) teachers reported that the quality of the technology was a motivating factor in their participation. While teachers' beliefs on collaboration and participation may be favorable, the educational environment must be

conducive to successful practice or teachers may refrain from engaging with it. Future research on factors including socio-economic challenges, lack of administrative support, and limited resources or access technology may enable program leaders to identify barriers to participation and address factors to enhance teacher development opportunities.

Virtual communities of practice have been shown to be advantageous in providing opportunities for teacher growth. Many educators have recognized the flexibility of the environment and the richness of its resources. The third assumption of my research was the expectation of truthfulness in participant responses. There were no indications that any of the participants in my study were untruthful. Through honest responses continued research on the alternate experiences of teachers who discontinue community practice may contribute to designing custom-made community learning models that truly reflect teachers' needs. A qualitative study that considers multiple representations of teacher engagement in practice with a focus on the elements that prove to be obstacles to participation is also recommended. As teachers confidently report barriers to their engagement in virtual communities of practice, there is greater likelihood training will provide opportunities for improving teacher practices leading to professional growth.

Implications

This research contributed to an understanding of the effects teachers' beliefs on learning and collaboration have on engagement in virtual communities of practice. Based on the evidence from this study, teachers' views are deep-rooted before they enter the

classroom. They sought worthwhile programs that enriched these beliefs for support in their continued practice. Teachers' receptiveness to new knowledge provided exposure to sophisticated techniques that resulted in teaching progress. Through focused attention to the findings, leaders and teachers may become acquainted with strategies that motivate individual teachers to construct new knowledge through interactions within learning communities and global educational connections. Deliberate planning in both Classroom 2.0 and Flat Connections fostered advancements in 21st century techniques that embodied an ever-changing society.

Technology that reflected modernized methods created opportunities for local and global collaboration that were successful when supported by organizational decision makers. The Partnership for 21st Century Skills (2007) emphasized that strong advocacy encouraged policies and initiatives that contributed to effective implementation of forward thinking educational systems. The benefits of stakeholder support are paramount as it may influence the replacement of long held educational paradigms with methods that align with contemporary societal changes and technological innovations including online learning. Social change may emerge as leaders and stakeholders continue to back educational development for an improved educational system.

Teacher matriculation in education programs may transform field experiences into virtual experiences, and pre-service teachers may graduate with the skills necessary to lead technology-based learning practices. Ertmer and Ottenbreit-Leftwich (2010) suggested pre-service teachers demonstrating evidence of their technology proficiency in

order to graduate. Traditionally structured educational models for professional development are becoming less prevalent. Progressive ideas and 21st century technologies have transformed learning. Technology provides the capacity for pedagogical changes which included interacting and improving "our relationship with the rest of the world" (Tapscott, 2009, p. 127). Technology's integration is vital in preparing students to participate in a global economy.

Educational reform may result in advancing teacher education programs that enhance their techniques, strategies, and knowledge of teaching their students in ways that correspond to the contemporary techniques necessary for the future (McCluskey et al., 2011). Focused attention to societal behaviors will enable the improvement of professional education that matches societal needs. Teachers must teach in a way that is adaptable to the way society behaves which means "moving beyond the schools and understanding the homes and communities children exist in" (Singh, 2010, p. 206). Consideration must be given to factors that include ever-changing social interpretations of family, communities, and learning. These once familiar structures have been transformed their new configurations should be emphasized in teacher educational programming. The most prudent way for education to affect change in schools is to determine the forces that have the greatest impact on the future of learning. If teachers can modify the way they perceive education, they can adjust the way they teach to meet the ways students learn.

Research participants represented a range of school communities with distinct characteristics and backgrounds. Attention to the needs of educators suggested alternative instructional tools that cater to learner needs while still delivering connected experiences. As educators continue to recognize the transformative techniques available for collaboration and participation within learning communities, they may change their beliefs and improve their instructional practices.

Communities of practice have become a safe place for teachers to engage in learning trials that are conducive to the exploration of new knowledge and skills. Social change will come from research that informs program leaders on the development of communities for learning that regard teachers' educational traits which would contribute to a personalized system for professional development. Taranto (2011) stated "as more and more people who have experience and preferences in using digital tools enter the teaching field, the preferred methods of forming professional learning communities will be in the form of new information and communication technologies" (p.13). As instructional methods and assessments consider varying teaching and learning styles, understanding learning inclinations may support deliberate organizational programming in which learning styles are the basis which may ensure deeper learning.

Virtual communities and personalized learning networks have proven to be fruitful grounds for teacher engagement and collaboration. Intentional planning and communication with community stakeholders could give rise to partnerships between the field of education and the professional community. Interaction between these two groups

may provide opportunities for exchanges that offer significant insights and collaborative opportunities. Evaluating programs outside of education will allow programmers to develop a broader scope in defining leadership and collaboration. Social change may be seen in the collaborative unions within the global community that may offer an awareness of essential skills which contribute to future professional success that has an impact on educational systems.

One of the many factors that can contribute to the changes apparent in teacher professional development is the advances made in educational technology. Discerning leaders have isolated best practices for leveraging technology's capacity to provide extended learning opportunities that incorporate worldwide resources for distinguished learning programs. Teaching professionalism can be enhanced through the use of virtual video opportunities that extend beyond a school's perimeter to support observations of the strongest and most talented facilitators in various career settings. This knowledge may contribute to social change in the field of education as teachers recognize other methods and styles of information and content delivery. The value of allowing learning to take place and knowledge creation to form will become more clear as teachers step aside and permit the processes to take place. A society of learners who are engaged through their passions may transform the future.

As methods of instruction shift more towards the facilitation of learning rather than direct instruction, learners may embrace their role in personalized learning systems. They may recognize characteristics that make learning meaningful to them. In turn this

may enable some to find their passion and focus their energies on successful approaches to their future. A new level of dedication in learning could create a society of empowered leaders working for social change.

Teachers' who bring in previous experiential knowledge in technology, collaboration, and professional ideology may contribute successful methods that are not present in their educational settings. The implications for change may begin through structured teacher evaluation to assist in identifying qualities that represent valued business or organizational practices. Positive attributes can then be used as a framework for determining desirable characteristics that influence the hiring of new teachers. This may result in focused professional development that cultivates strong techniques which have been proven effective in outside organizational systems.

Professional development in which teachers educate other teachers through modeling and mentoring has not produced anticipated results. Even with the support of learning communities and social networks there was no evidence to indicate that teachers have become outspoken advocates for training that enables them to reach their self-defined goals. An investigation of what makes outside organizations prosperous may provide a broader scope of tactics and skills that could influence teachers' to command their professional development. As education becomes more aligned with superior examples of success, teacher development practices may help educators prepare themselves to instruct society's students.

The abundance of growth opportunities related to virtual communities of practice extended to reach educators, students, administrators, and stakeholders. Through the support of various organizations the possibilities for change in the culture of teaching are evident. An effectively restructured system of professional development and teacher support could lead educators to become the movers and the shakers of 21st century education. As teachers become knowledgeable in how to create success in learning they change the culture of learning that may then more closely reflect the demands of society.

Advancement of the educational community may occur through greater stakeholder support, innovative instructional ideologies, and practices that reflect the changes and progress made through technology. The growth expected by educational systems can only occur if leaders and teachers embrace anticipated changes. The discord created by this change will be temporary and may ultimately push teachers to utilize improved instructional strategies. Educational reform through personalized teacher professional development and extended community relationships may create social change that is in concert with contemporary 21st Century practices.

Conclusion

The field of education has the potential to grow exponentially through observation and working relationships with community organizations. Communities of practice serve as a tool for teachers to engage in educational discourse yet do not create the necessary impetus for teachers' individual growth and exploration after participation. Teachers' beliefs regarding their personal learning and collaboration lacked the force to drive

themselves towards finding extended sources for their edification. The participants' implementation of technology in their classrooms, after their community practice, began to show signs of positive movement. However, the levels of curiosity to go above and beyond what their communities offered were not evident.

The implications brought forth by this research point to advances in the field of educational technology. Teacher training that is influenced by the strongest results in research may offer previously unimagined improvements in teacher training. These types of educational experiences will begin to see positive effects and teachers will experience opportunities for learning that their match their needs and are applicable to the instruction of a new generations of students. Educational leaders and instructional planners will have new data that may provide a solid foundation on which they can design personalized teacher learning experiences. Social change can occur when conflicting paradigms are accommodated; work is guided by passion, and the leveraging of useful tools like technology, engage people in meaningful tasks. Once leaders reconcile these factors, educational practice in the 21st century has the power to affect the future of learning.

References

Abbitt, J. (2011). Measuring technological pedagogical content knowledge in pre-service teacher education: A review of current methods and instruments. *Journal of Research on Technology and Education, 43*(3), 281-300.

Ahrens, A., & Zaščerinska, J. (2010).*Social dimension of Web 2.0 in student teacher professional development*. Paper presented at Association for Education in Europe Conference.

An, Y., & Reigeluth, C. (2011). Creating technology-enhanced, learner-centered classrooms: K-12 teacher beliefs, perceptions, barriers, and support needs. *Journal of Digital Learning in Teacher Education, 28*(2), 54-62.

Arizona K12 Center. (2012). TIM: Arizona technology integration matrix. Northern Arizona University. Retrieved from http://www.azk12.org/tim/.

Atkins, D., Bennett, J., Brown, J., Chopra, A., Dede, C., & Fishman, B. (2010).*Transforming American education: Learning powered by technology*. Washington DC: US Department of Education.

Avalos, B. (2011). Teacher professional development and teacher education over ten years. *Teacher and Teaching Education*, 10-20.

Baker, S, E., & Edwards, R. (2012). How many qualitative interviews is enough: Expert voices and early career reflections on sampling and cases in qualitative research, *National Center for Research Methods*, 1-42.

Baker-Eveleth, L, Chung, Y., Eveleth, D., & O'Neill, M. (2011).Developing a community of practice through learning climate, leader support, and leader interaction. *American Journal of Business*, *4*(2), 33-40.

Baker-Doyle, K, & Yoon, S. (2011). In search of practitioner-based social capital: A social network analysis tool for understanding and facilitating teacher collaboration in a US-based STEM professional development program. *Professional Development in Education*, *37*(1), 75-93.

Baran, B., & Cagiltay, K. (2010). Motivators and barriers in the development on online communities of practice. *EitimArastirmalari-Eurasian Journal of Educational Research, 39,* 79-96.

Berry, B., Daughtrey, A., & Weider, A. (2010). Preparing to lead an effective classroom: The role of teacher training and professional development programs. *Center for Teaching Quality*, 1-12.

Buckley, S., & DuToit, A. (2010). Academics leave your ivory tower: Form communities of practice. *Educational Studies, 36*(5), 493-503.

Chen, C., & Reimer, T. (2009). Teacher beliefs, contextual factors, and Taiwanese high school teachers' integration of technology into the classroom. *International Journal on Digital Learning Technology, 1*(3), 224-244.

Chou, C. (2011). Teachers' professional development: Investigating teachers' learning to do action research in a professional learning community. *The Asia-Pacific Education Researcher, 20*(3), 421-437.

Cifuentes, L., Maxwell, G., & Bulu, S. (2011). Technology integration through professional learning community. *Journal of Educational Computing Research, 44*(1), 59-82.

Conole, G., Galley, R., & Culver, J. (2011). Frameworks for understanding the nature of interactions, networking, and community in a social networking site for academic practice. *International Review of Research in Open and Distant Learning, 12*(3), 119-137.

Darling-Hammond, L., Wei R.C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. Dallas, TX. National Staff Development Council.

Dass, S., Dabbagh, N., & Clark, K. (2011). Using virtual worlds: What the research says. *The Quarterly Review of Distance Education, 12*(2), 95–111.

Duncan-Howell, J. (2010). Teachers making connections: Online communities as a source of professional learning. *British Journal of Educational Technology, 41*(2), 324-340.

Ernest, P., Heiser, S., & Murphy, L. (2013).Developing teacher skills to support collaborative online language learning. *Language Learning Journal, 41*(1), 37-54.

Ertmer, P., & Ottenbreit-Leftwich, A. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research and Technology, 42*(3), 255-284.

Ertmer, P., Ottenbreit-Leftwich A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship, *Computers & Education, 59,* 423–435.

Evers, J. (2011). From the past into the future. How technological developments change our ways of data collection, transcription and analysis. *Forum: Qualitative Social Research, 12*(1), 1-31.

Fazio, X. (2009). Development of a community of science teachers: Participation in a collaborative action research project. *School Science and Mathematics, 190*(2), 95-109.

Florida Center for Instructional Technology (2014).The Technology Integration Matrix. Retrieved from http://fcit.usf.edu/matrix/index.php.

Frost, J., Akmal, T., & Kingrey, J. (2010).Planning teacher development: The struggles and successes of an inter-organizational collaboration. *Professional Development in Education, 36*(4), 581-595.

Gaffney, M. (2010). Enhancing teachers' take-up of digital content: Factors and design principles in technology adoption. Education Services Australia Limited.

Gu, X., Zha, C., Li, S., & Laffey, J. (2011). Design, sharing and co-construction of learning resources: A case of life-long learning communities in Shanghai. *Australian Journal of Educational Technology, 27*(2), 204-220.

Guasch, T., Alvarez, I., & Espasa, A. (2010). University teacher competencies in a virtual teaching learning environment: Analysis of a teacher training experience. *Teaching and Teacher Education*, 199-206.

Hall, G., & Hord, S. (2011). Implementing change: Patterns, principles and potholes. (3rd ed.), Upper Saddle River, NJ: Pearson.

Hord, S. (1997). Professional learning communities: Communities of continuous inquiry and improvement. *Southwest Educational Development Laboratory*, 1-72.

Howard, S., Chan, A., & Caputi, P. (2014). More than beliefs: Subject areas and teachers' integration of laptops in secondary teaching. *British Journal of Educational Technology*, 1-10.

Huggins, K., Scheurich, J., & Morgan, J. (2011). Professional learning communities as a leadership strategy to drive math success in an urban high school serving diverse, low income students: A case study. *Journal of Education for Students Placed at Risk, 16*, 68-88.

Hur, J. W., & Brush, T. (2009). Teacher participation in online communities: Why do teachers want to participate in self-generated online communities of K-12 teachers? *Journal of Research on Technology in Education*, *41*(3), 279-303.

Hutchison, A. (2012). Literacy teachers' perceptions of professional development that increases integration of technology into literacy instruction. *Technology, Pedagogy, and Education, 21*(1), 37 – 56.

Inan, F., & Lowther, D. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Education Tech Research Development, 58*(1), 137-154.

Karnieli-Miller, O., Strier, R., & Pessach, L. (2009). Power relations in qualitative research. *Qualitative Health Research, 19*(2), 279-289.

Kasi, F. (2010). Collaborative action research: An alternative method for EFL teacher professional development in Pakistan. *Asian EFL Journal, 12*(3), 98-117.

Kensler, L., Reames, E., Murray, J., & Patrick, L. (2011). Systems thinking tools for improving evidence- based practice: A cross case analysis of two high school leadership teams. *The High School Journal*, 32-53.

Keown, P. (2009). The tale of two virtual teacher professional development modules. *International Research in Geographical and Environmental Education, 18*(4), 295-303.

Keung, C., C. (2009). Cultivating communities of practice via Learning Study for enhancing teacher learning. *KEDI Journal of Educational Policy, 6*(1), 81-104.

Khoo, E., & Forrett, M. (2011). Evaluating an online community: Intellectual, social and emotional development and transformations. *Waikato Journal of Education, 16*(1), 123-142.

Killion, J. (2013). Tapping into technology's potential. *JSD The Learning Forward Journal, 34*(1), 10-18.

Kim, C., Kim, M., Lee, C., Spector, M., & DeMeester, K. (2013).Teacher beliefs and technology integration. *Teaching and Teacher Education, 20*, 76-85.

Kopcha, T. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education, 59,* 1109–1121.

Laluvein, J. (2010). School inclusion and the community of practice. *International Journal of Inclusive Education, 14*(1), 35-48.

Lee, M. & Tsai, C. (2010). Exploring teachers' perceived self-efficacy and technological pedagogical content knowledge with respect to educational use on the World Wide Web. *Instructional Science 38*, 1-21.

Maloney, C, & Konza, D. (2011). A case study of teachers' professional learning: Becoming a community of professional learning or not? *Issues in Educational Research, 21*(1), 75-87.

McArdle, K., & Coutts, N. (2010). Taking teachers' continuous professional development (CPD) beyond reflection: Adding shared sense-making and collaborative engagement for professional renewal. *Studies in Continuing Education, 32*(3), 201-215.

McCluskey, K., Sim, C., & Johnson, G. (2011).Imagining a profession: A beginning teacher's story of isolation. *Teaching Education, 22*(1), 79-90.

Melville, W., & Yaxley, B. (2009). Contextual opportunities for teacher professional learning: The experience of one science department. *Eurasia Journal of Mathematics, Science, and Technology Education, 5*(4), 357-368.

Merriam, S. (2009). Qualitative research: A guide to design and research, (2nd ed.). Thousand Oaks, CA: Josey Bass.

Miranda, H., & Russell, M. (2011). Predictors of teacher-directed student use of technology in elementary classrooms: A multilevel SEM approach using data from the USEIT study. *Journal of Research on Technology, 43*(4), 301-323.

Musawi, A. S. (2011). Redefining technology role in education. *Creative Education, 2*(2), 130-135.

Nussbaum-Beach, S. & Ritter-Hall, L. (2012). The connected educator: Learning and leading in a digital age. Bloomington, IN: Solution Tree.

Palak, D., & Walls, R. (2009). Teachers' beliefs and technology practices: A mixed-methods approach. *Journal of Research on Technology in Education, 41*(4), 417-441.

Pella, S. (2011).A situated perspective on developing writing pedagogy in a teacher professional learning community. *Teacher Education Quarterly*, 107-125.

Polly, D., Mims, C., Shepard, C., & Inan, F. (2009). Evidence of impact: Transforming teacher education with preparing tomorrows teachers to teach with technology (PT3) grants. *Teaching and Teacher Education*, 1-8.

Prestridge, S. (2012). The beliefs behind the teacher that influences their ICT practices. *Computers& Education, 58*(1), 449-458.

Rahman, S.M. (2011). Influence of professional learning community (PLC) on secondary science teachers' culture of professional practice: The case of Bangladesh. *Asia Pacific Forum on Science Learning and Teaching, 12*(1), 1-23.

Richmond, G., & Manokore, V. (2010). Identifying elements critical for functional and sustainable professional learning communities. *Science Teacher Education*, 543-570.

Riveros, A., Newton, P., & Burgess, D. (2012). A situated account of teacher agency and learning: Critical reflections on professional learning communities. *Canadian Journal of Education, 35*(1), 202-216.

Roth, W.M. (2013). Translation in qualitative social research: The possible impossible. *Forum: Qualitative Social Research, 14*(2), 1- 24.

Sang, G., Valcke, M., Braak, J. V., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education, 54*(1), 103-112.

Schreck, M. (2009). Transformers: Creative teachers for the 21st century. Thousand Oaks, CA: Corwin Press.

Shernoff, E., Mariñez-Lora, A., Frazier, S., Jakobsons, L., Atkins, M., & Bonner, D. (2011). Teachers supporting teachers in urban schools: What iterative research designs can teach us. *School Psychology Review, 40*(4), 465-485.

Shriner, M., Clark, D., Nail, M., & Schlee, B. (2010). Social studies instruction: Changing teacher confidence in classrooms enhanced by technology. *The Social Studies, 101*, 37-45.

Siemon, D. (2009). Developing mathematics knowledge keepers: Issues at the intersection of communities of practice. *Eurasia Journal of Mathematics, Science, and Technology Education, 5*(3), 221-234.

Singh, V. (2010).Making the links: Equity, pedagogy, pre-service teacher dispositions and technology for inclusion. *Literacy Information and Computer Education Journal, 1*(3), 202-210.

Slatter, W., & France, B. (2010). Taking part in the dance: Technology teachers interacting with communities of practice. *International Journal of Technology and Design Education, 21*, 217-233.

Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication & Information, 2*(1), 23-49.

Swan, K., & Shea, P. (2005). The development of virtual learning communities. *Asynchronous Learning Networks: The Research Frontier.* New York: Hampton Press, 239-260.

Swan, K., Kratcoski, A., Mazzer, P., &Schenker, J. (2005).Bringing Mohammed to the mountain: Situated professional development in a ubiquitous computing classroom. *Journal of Educational Computing Research, 32*(4), 353-365.

Tapscott, D. (2009). Grown up digital: How the net generation is changing your world. New York, NY: McGraw-Hill.

Taranto, G. (2011). New-teacher induction 2.0.*Journal of Digital Learning in Teacher Education*, *28*(1), 4-15.

Thang, S., Hall, C., Murugaiah, P., & Azman, H. (2011). Creating and maintaining online communities of practice in Malaysian Smart Schools: Challenging realities. *Educational Action Research, 19*(1), 87-105.

Tondeur, J., van Braak, J., Sang, G., Voogt, J., Fisser, P., & Ottenbreit-Leftwich (2011).Preparing pre-service teachers to integrate technology into education: A synthesis of qualitative evidence. *Computers in Education*, 1-11.

Tsai, I., Laffey, J., & Hanuscin, D. (2010). Effectiveness of an online community of practice for learning to teach elementary science. *Educational Computing Research, 43*(2), 225-258.

Varga-Atkins, T., O'Brien, M., Burton, D., Campbell, A., & Qualter, A. (2010). The importance of interplay between school-based and networked professional development: School professionals' experiences on inter-school collaborations in learning networks. *Journal for Educational Change*, 11, 241-272.

Voogt, J. (2010). Teacher factors associated with innovative curriculum goals and pedagogical practices: Differences between extensive and non-extensive ICT-using science teachers. *Journal of Computer Assisted Learning, 26,* 453-464.

Wahyuni, D. (2012). The research design maze: Understanding paradigms, cases, methods and methodologies. *Jamar, 10*(1), 1-12.

Walker, A., Recker, M., Robertshaw, M.B., Osen, J., & Leary, H. (2011). Integrating technology and problem-based learning: A mixed methods study of two teacher professional development designs. *Interdisciplinary Journal of Problem-based learning*, *5*(2), 70-94.

Wei, R., Darling-Hammond, L., & Adamson, F. (2010). Professional development in the United States: Trends and challenges. Dallas, TX: National Staff Development Council.

Wenger, E. (1998). Communities of practice: Learning meaning, and identity. Cambridge, MA: Cambridge University Press.

Wenger, E., McDermott, R., & Snyder, W. M. (2002). Cultivating communities of practice: A guide to managing knowledge. Boston: Harvard Business School Press.

Wenger, E., White, N., & Smith, J. (2009). Digital habitats: stewarding technology for communities. Portland, OR: CPSquare.

Wong, J. (2010). Searching for good practice in teaching: A comparison of two subject-based professional learning communities in a secondary school in Shanghai. *Compare*, *40*(5), 623-639.

Yin, R. (2012). Applications of case study research (3rd ed.). Thousand Oaks, CA: Sage.

Yin, R. (2009). Case study research: Design and methods (4th ed.). Thousand Oaks, CA: Sage.

Appendix A: Initial Interview Questions

Research Question 1: How is teaching enhanced through participation in communities of practice and personalized networks of learning?

- Can you share how your participation in Classroom 2.0 / Flat Connections influenced your teaching?
- Will you describe the ways your personalized learning network helped you in your teaching? These would be the groups you joined within Classroom 2.0 / Flat Connections that were specific to what you wanted to learn, ex: math or foreign language group.
- How did your participation in Classroom 2.0 / Flat Connections community of practice help you learn to integrate technology into your teaching?

Research Question 2: How do teachers' beliefs of collegial collaboration influence their engagement in virtual communities of practice?

- When you're in a typical school situation, can you describe how you usually go about collaborating with your peers?
- How did you use those collaboration techniques to determine how and who you would work with in Classroom 2.0 / Flat Connections? What drew you to the certain people you chose to collaborate with?
- After participating in Classroom 2.0 / Flat Connections have your beliefs on how you collaborate with other teachers changed?

Research Question 3: How do teachers' beliefs of personal learning influence their engagement in virtual communities of practice?

- Before joining Classroom 2.0 / Flat Connections how did you go about learning more about your field and teaching outside of the professional development your school provided?
- Can you describe how your beliefs about your learning influenced the way you approached learning within the Classroom 2.0 / Flat Connections community?
- How has being part of Classroom 2.0 / Flat Connections changed your beliefs about how and where you learn? Were your personal beliefs about learning expanded or challenged while participating in Classroom 2.0 / Flat Connections?

Appendix B: Follow-Up Interview Questions

Patterns and Themes: (NOTE: Following my analysis of the first interviews and Ning data I will use the patterns and themes as a basis follow-up interview questions. These are samples that I may use)

Research Question 1: How is teaching enhanced through participation in communities of practice and personalized networks of learning?

- Many comments on the Ning talked about the benefits of being part of and participating in the Classroom 2.0 / Flat Connections learning community like _____. Were your experiences consistent with this point?
- From the first interviews and comments on the Ning it seemed like teachers felt _____ when they interacted within their personalized learning networks. How did your personalized learning network contribute to or diminish _____in terms of your teaching practices?
- Many teachers mentioned that using the technology tools within Classroom 2.0 / Flat Connections, like Twitter, Skype and Elluminate sessions, was _____. Can you tell me how the technology you used in Classroom 2.0 / Flat Connections helped you feel more or less comfortable using technology in your teaching?

Research Question 2: How do teachers' beliefs of collegial collaboration influence their engagement in virtual communities of practice?

- Comments from the Ning conveyed that after participating for a short while, teachers became more confident in collaboration because _____. Can you describe how your beliefs about collaboration influenced your participation in Classroom 2.0 / Flat Connections?
- Teachers also shared that they liked _____ during both synchronous and asynchronous collaborations. Will you describe how the Ning was useful to you in sharing and learning from others?

Research Question 3: How do teachers' beliefs of personal learning influence their engagement in virtual communities of practice?

- Based on the Ning comments and the analysis of the first interviews, I found beliefs about personal learning influenced their engagement by _____ Can you elaborate on this.
- From the Ning Would you find this some teachers described Classroom 2.0 / Flat Connections as _____. Can you share how your experience was similar of different from this?

Appendix C: Ning Analysis

Classroom 2.0 / Flat Connections Ning Analysis

RQ1: How is teaching enhanced through participation in communities of practice and personalized networks of learning?	
Date: **Findings:** (Themes) **Date:** **Findings:** (Themes)	
RQ2: How do teachers' beliefs on collegial collaboration influence their engagement in virtual communities of practice?	
Date: **Findings:** (Themes) **Date:** **Findings:** (Themes)	
RQ3: How do teachers' beliefs of personal learning influence their engagement in virtual communities of practice?	
Date: **Findings:** (Themes) **Date:** **Findings:** (Themes)	

Appendix D: Letter of Cooperation for Classroom 2.0

Classroom 2.0
Steve Hargadon

November 5, 2013

Dear Rose Arnell,

Based on my review of your research proposal, I give permission for you to conduct the study, *Teacher Pedagogical Beliefs and Participation in Virtual Communities of Practice,* within the Classroom 2.0 online community. As part of this study, I authorize you to post a letter of inquiry within the Classroom 2.0 community for potential participants, contact participants via email, telephone, or Skype, and share the results with participants when they request them. Classroom 2.0 members' participation will be voluntary and at their own discretion.

I understand that my only responsibility is granting you access to the postings of the members of the Classroom 2.0 community. I reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting.

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

Sincerely,

Steve Hargadon
Authorization Official
Contact Information

Appendix E: Letter of Cooperation for Flat Connections

Flat Connections Global Project
Julie Lindsay

April 14, 2014

Dear Rose Arnell,

Based on my review of your research proposal, I give permission for you to conduct the study, *Teacher Beliefs on Self Learning and Participation in Virtual Communities of Practice,* within Flat Connections Global Project online community. As part of this study, I authorize you to post a letter of inquiry within the Flat Connections Global Projects community for potential participants, contact participants via email, telephone, or Skype, and share the results with participants when they request them. The Flat Connections Global Project members' participation will be voluntary and at their own discretion.

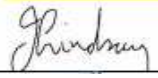
I understand that my only responsibility is granting you access to the postings of the members of the Flat Connections Global Project community. I reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting.

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

Sincerely,

Julie Lindsay
Authorization Official: Director, Learning Confluence P/L
Contact Information: PO Box 14, Ocean Shores, NSW 2483 Australia. Lindsay.julie@gmail.com



Appendix F: Letter of Invitation for Classroom 2.0

You are invited to take part in a research study of your experiences and beliefs on learning within Classroom 2.0. Research will be conducted by me, Rose Arnell, a doctoral student at Walden University. If you are interested in participating please click on this link and respond to these 3 short questions.

Letter of Invitation

PARTICIPATION IN CLASSROOM 2.0

You are invited to take part in a research study of your experiences and beliefs on learning within an online community. I am looking for K-12 classroom teachers who have participated in Classroom 2.0 for at least one year by posting to the classroom Ning. Research will be conducted by me, Rose Arnell, a doctoral student at Walden University.
If you are interested in participating please respond to these 3 short questions.

* Required

Participation Criteria

In order to determine if you would qualify for this research study, you must respond 'Yes' to the following questions.

First and last name: *
Your name or any identifying information will NOT be used in the research

1. I am a K-12 teacher *
- Yes
- No

2. I have participated in Classroom 2.0 for at least 1 year. *
- Yes
- No

3. I have made contributions to the Classroom 2.0 Ning. *
- Yes
- No

4. E-mail address *

Submit

Appendix G: Letter of Invitation for Flat Connections

You are invited to take part in a research study of your experiences and beliefs on learning within an online community. I am looking for K-12 classroom teachers who have participated in Classroom 2.0 or Flat Connections for at least one year by posting to the classroom Ning. Research will be conducted by me, Rose Arnell, a doctoral student at Walden University. If interested in participating please respond to these 3 short questions.

Letter of Invitation

PARTICIPATION IN CLASSROOM 2.0 / FLAT CONNECTIONS GLOBAL PROJECT STUDY

You are invited to take part in a research study of your experiences and beliefs on learning within an online community. I am looking for K-12 classroom teachers who have participated in Classroom 2.0 or Flat Connections Global Project for at least one year by posting to the classroom Ning. Research will be conducted by me, Rose Arnell, a doctoral student at Walden University.
If you are interested in participating please respond to these 3 short questions.

* Required

Participation Criteria

In order to determine if you would qualify for this research study, you must respond 'Yes' to the following questions.

First and last name: *
Your name or any identifying information will NOT be used in the research

This is a required question

1. I am a K-12 teacher *
- Yes
- No

2. I have participated in Classroom 2.0 or Flat Connections Global Project for at least 1 year. *
- Yes
- No

3. I have made contributions to the Classroom 2.0 or Flat Connections Global Project Ning *
- Yes
- No

4. E-mail address *

Submit

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Appendix H: Consent Form

After you have read and signed the Consent Form please reply to my e-mail with the word CONSENT at the top of the page or in the Subject Line. I will then contact you to set up a time for your interview.

You are invited to take part in a research study that tries to understand if teachers' personal views on learning and collaboration have an effect on their participation in the Classroom 2.0 community. The study will also try to determine if teachers' personalized networks enhance their teaching. The researcher is inviting teachers who participate in Classroom 2.0 to be in the study.

This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part. This study is being conducted by a researcher named Rose Arnell who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to determine how teachers' beliefs about their own learning and collaboration with others affect their engagement in Classroom 2.0. It also seeks to determine how participation in communities of practice within Classroom 2.0 (for personal and professional development) enriches teaching.

Procedures:
If you agree to be in this study, you will be asked to:

- Respond to initial interview questions asked via Skype or telephone. This will take approximately 45-60 minutes.
- Respond to follow-up, clarifying interview questions asked via Skype or telephone which will take approximately 45-60 minutes

The researcher will also conduct a Classroom 2.0 Ning review looking for comment and participation patterns on personalized learning and collaboration.

Here are some sample questions:

- How has your teaching been impacted by your participation in Classroom 2.0?
- Describe some of the benefits of using Classroom 2.0 for your personal and professional development.

Voluntary Nature of the Study:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one at Walden University or the Classroom 2.0 community will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as fatigue during the time it takes to conduct the initial and follow-up interviews. Being in this study would not pose risk to your safety or wellbeing. The benefits of participating in this study include a contribution to the Classroom 2.0 community and its continued positive delivery of services to teachers.

Payment:
There will not be any payment, reimbursement, or gifts for your participation in this study.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure on a flash drive and stored in a locked in a file cabinet. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via Skype or via e-mail. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is [redacted] (for US based participants). Walden University's approval number for this study is 02-28-14-0047910 and it expires on 02-28-15-0047910

Please print or save this consent form for your records (for online research).

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By replying to this email with the words, "I consent," I understand that I am agreeing to the terms described above.

Thank you for your participation.
Rose Arnell

Appendix I: Letter of Inquiry on Classroom 2.0 Homepage

This announcement will be posted on the front page of the Classroom 2.0 Ning. When they click the link it will take them to my page within the Classroom 2.0 Ning. The Letter of Invitation will be posted there.

Appendix J: Letter of Inquiry Flat Connections

This announcement will be posted on the front page of the Flat Connections Homepage Ning. When they click the link it will take them to my page within the Flat Connections Homepage Ning. The Letter of Invitation will be posted here.

Appendix K: Second Letter of Invitation Classroom 2.0

If fewer than nine teachers respond to the invitation to participate, I will repost this announcement.

Second Request for Participation

PARTICIPATION IN CLASSROOM 2.0

You are invited to take part in a research study of your experiences and beliefs on learning within an online community. I am looking for K-12 classroom teachers who have participated in Classroom 2.0 for at least one year by posting to the classroom Ning. Research will be conducted by me, Rose Arnell, a doctoral student at Walden University.

If you are interested in participating please click on this link and respond to these 3 short questions.

* Required

Participation Criteria

In order to determine if you would qualify for this research study, you must respond 'Yes' to the following questions.

First and last name: *

Your name or any identifying information will NOT be used in the research

1. I am a K-12 teacher *

- Yes
- No

2. I have participated in Classroom 2.0 for at least 1 year. *

- Yes
- No

3. I have made contributions to the Classroom 2.0 Ning. *

- Yes
- No

4. E-mail address *

Submit

Appendix L: Second Letter of Invitation for Flat Connections

Second Request for Participation

PARTICIPATION IN CLASSROOM 2.0 / FLAT CONNECTIONS GLOBAL PROJECT STUDY

You are invited to take part in a research study of your experiences and beliefs on learning within an online community. I am looking for K-12 classroom teachers who have participated in Classroom 2.0 / Flat Connections Global Project for at least one year by posting to the classroom Ning. Research will be conducted by me, Rose Arnell, a doctoral student at Walden University. If you are interested in participating please click on this link and respond to these 3 short questions.

* Required

Participation Criteria

In order to determine if you would qualify for this research study, you must respond 'Yes' to the following questions.

First and last name: *

Your name or any identifying information will NOT be used in the research

1. I am a K-12 teacher *

- Yes
- No

2. I have participated in Classroom 2.0 / Flat Connections Global Project for at least 1 year. *

- Yes
- No

3. I have made contributions to the Classroom 2.0 / Flat Connections Global Project Ning. *

- Yes
- No

4. E-mail address *

Submit

Never submit passwords through Google Forms.

Appendix M: E-mail to Potential Participants

Thank you for your willingness to take part in my research. As part of the process, if you are selected as a participant in the research, you must first read and sign a letter of consent. It provides you with background information about my research, the procedures, and your role in the process.

I appreciate your support which will allow me to gain first-hand data about participation and learning within the Classroom 2.0 or Flat Connections community from experienced users. Your expertise will make a difference in the research and contribute to change in the field of education.

Thank you,

Rose Arnell

Walden University Doctoral Student

ROSE ARNELL
Curriculum Vitae

Professional Summary

Leader and innovator of multi-level technology experiences such as a STEM event for women, a school television studio, and virtual clubs. Author and recipient of over 10 grants to augment real-world, interdisciplinary activities for students and teachers. Local, state, and national level presenter purposefully using technology to motivate and challenge ideology. A strong communicator with a vision for innovation in education and leadership. A Ph.D. in educational technology heightens the commitment to delivering comprehensive initiatives that enhance knowledge building on the learning stage and in the global classroom.

Education

Ph.D. in Education, Specialization in Educational Technology, Walden University, Minneapolis, Minnesota
- Dissertation Topic: Teacher Beliefs on Self Learning, Collaboration, and Participation in Virtual Communities of Practice 2014
- Dissertation Advisor: Dr. MaryFriend Shepard

Master Teacher Status, Forest Hills School District 2011

Masters of Education Specialization K-12 Gifted,
Xavier University, Cincinnati, OH. 1999

Bachelor of Science in Education, Elementary 1-8, **Specialization**,
Education of the Handicapped, K-12, Xavier University, Cincinnati, OH. 1989

Professional Experiences

- Middle School Gifted Specialist, Forest Hills School District, Cincinnati, OH. 2008-present
    - Developed and delivered a young women's STEM program, Empowering Determined Girls in Education (EDGE), servicing local school districts.

ROSE ARNELL
Curriculum Vitae

Female science professionals engaged 150 young women in discussions and explorations in math and science based careers.
- Developed and conducted Gear Heads, a virtual technology club using WizIQ virtual conferencing tool for high-level technology students. Applications included Blender, app development, and programming skills
- Designed and led face to-face computer club focused on gaming, coding, and maker movement
- Supported students learning code using Scratch, Code Academy, Alice, and programming
- Engaged students with creative design technology and conductive paint and pens using MakeyMakey

- Secondary Gifted Specialist, Forest Hills School District, Cincinnati, OH. 2004-2008
  - Developed and delivered a distance learning career-based program for high school students with opportunities from Vanderbilt University and Ohio State University.
- Ashland University Instructor, Technology and Gifted Licensure Program 2003-2006
- Elementary Gifted Specialist, Forest Hills School District, Cincinnati, OH. 1989-1996
  - Designed and executed a live television studio in an elementary school for student-delivered, daily live announcements, interviews with visiting authors, and grade level activities
- Elementary Teacher, Sycamore Community Schools, Cincinnati, OH. 1989-1996

Professional Development Delivered

- Tech Talk (2010). Developed and led a weekly teacher group to support integration and extend the use of technology applications ranging from basic to complex in the middle school classroom.
- Teacher Professional Development (2009-2013). Direct instruction and support of various technology topics and applications including using wikis, working with video media and sound, creating self-grading assessments, Google Forms and Documents.

ROSE ARNELL
Curriculum Vitae

- Cadre Leader Powerful Learning Practice (PLP) (2010). Collaborative management of teacher team and technology applications of a self-designed professional learning model and networked learning.

Professional Presentations

- Arnell, R. (2011). Yearning for technology learning, In Service Learning, Ohio Association for Gifted Children (OAGC) Teacher Academy presenter
- Arnell, R. (2009). Empowering determined girls in education (EDGE) STEM program for young women.
- Arnell, R. (2009). Differentiation in the Advanced Placement Classroom, Miami University Cincinnati, OH.
- Arnell, R. (2009-2010). Web 2.0 Technology Tools, Southwestern Ohio Instructional Technology Association (SOITA)
- *Arnell, R. (2008). Developing International Global Collaborations,* Women of Web 2.0 Podcast *Guest Speaker*
- Arnell, R., and Nance, R. (1998). Using Computer Software and Technology with Gifted Students, Ohio Association Gifted Children (OAGC) Conference
- Arnell, R., and Nance, R. (1999). Meeting the needs of artistically talented superior cognitive students. State of Ohio Reason for Proposal (RFP) grant recipient presented finding with school district board
- Shepard, M., Toledo, C., and Arnell, R. (2009). Power boost your lessons with wikis, International Society for Technology in Education/National Educational Computing Conference (ISTE/NECC) Washington, D.C.

Grants Received

- State of Ohio Reason for Proposal (RFP) (1998). Meeting the needs of artistically talented superior cognitive students. Pairing of artistically talented and superior cognitive students to create a visual representation based on social awareness topics through the use of Photoshop graphic arts software. Presented findings at Ohio Association Gifted Conference (OAGC) and local school district administrative panel
- Cinergy Foundation Youth Environmental Service Program (1998). ($500). Guided students in designing and creating the Outdoor Classroom and Neighborhood Clean-up Project in a local, over run woods.
- Hamilton County Educational Services Center:

ROSE ARNELL
Curriculum Vitae

  - Outdoor Education (1998). ($968) Funding to support Cinergy Foundation grant. Program highlights include scientific exploration materials, seating cushions (student created), and teacher resources for conducting class in the outdoor classroom.
  - Robotics (1999). ($980) The purchase of Lego® and Dacta® materials and RoboLab Starter Kits for the development of critical thinking, analytic reasoning and mathematical skills.
  - Tower of Power (2002). ($500) Graphing calculators and motion sensors used to collect and calculate mathematic and scientific data of objects in motion on a student built tower.

- Teaching Tolerance (2003). Pupils Engaged in Affecting Change Educationally (PEACE). ($800). The purchase of paint and materials to create a multicultural mural within the school and multicultural music from Putumayo Kids for school-wide music streaming.
- Think Ink: Mimio Teach Interactive Whiteboard (2002). Received technology equipment to create an interactive whiteboard using an existing dry erase board which connected to a computer for automatic documentation and sharing.
- Greater Cincinnati Foundation (2000). Math Totes ($1,000). Color coordinated tubes housed extension materials related to math curriculum for use with gifted students in the classroom.
- National Science Foundation and Xavier University (1998). ($500) Geoscience Education through Instructional Technology (GETIT) pilot and evaluation of software on volcanism developed through a partnership of scientists and the Geological Society of America.

Professional Affiliations

Member, Ohio Association for Gifted Students, (OAGC)

References

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Forest Hills Schools
District Curriculum Services Director
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natashaadams@foresthills.edu