Digital Distance Learning Communities:

Teachers' Beliefs about Community in K-12 Online Education

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Abstract

This study was designed to look at K-12 teacher beliefs about the role that community plays in their online learning classes and how instructors use communication, technology and pedagogical methodologies to form class communities. This study sought to answer three major questions: 1) What are instructor beliefs about the role that community plays in online learning and what are the challenges to forming those communities? 2) Which methodologies and technologies do instructors use to promote a feeling of community for their online students? 3) Which artifacts of teaching provide evidence of the formation and continuation of digital distance education communities? This study used a qualitative multi-case research methodology which included teacher interviews and teaching artifact observations from eight online instructors who taught high school online credit classes. Findings from the study indicated that among the sample population, teachers who believed in the value of community, integrated community building features into their courses. Secondly, technologies which permitted interactive online classes produced the highest operating online learning communities. Finally, institutional support of online educational communities, including technology availability and high expectations, produced the highest operating communities. This study is important because community features such as trust, interdependence and feelings of connectedness have been associated with student persistence in online higher education and this study demonstrates these features have been found to be important in K-12 education too. Also, significant shifts of educational delivery are expected to include more digital distance education and future course designers can utilize this information as they build new K-12 online learning communities.

Dedication

This work is dedicated to my family and friends who have remained supportive during my years of class work, research and writing. My parents and my siblings deeply influenced me to continue with my studies. Throughout my graduate studies, my dear son Nicholas inspired me with the power and opportunities that the online world holds. The Internet has been ever-present within his lifetime. I have watched him pioneer digital technologies from kindergarten through college. No doubt digital learning will continue to be a part of his future.

I would like to express my gratitude for my dissertation committee as they have also been my professors throughout my graduate education. They have taught me much of what I know about literacy, technology and distance education. I want to especially thank Dr. Erica Boling who has guided me as my student advisor and dissertation chair throughout my doctorate work. She has also given me the opportunity to develop my pedagogical craft. I am grateful for her encouragement for me to continue with my research and to support me in the process.

Finally, many thanks to my students for all that you have taught me about learning online and for helping me to be the online educator that I am today.

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Chapter I: INTRODUCTION

After the school bell rings, twenty-first century children are spending hours each day "powered up." Students aged 8 to 18 are spending on average 7.5 hours outside of school each day engaged with media, including television, computers, music devises and phones (Rideiut, Foehr, & Roberts, 2010). Teens spend on average 1.5 hours each day outside of school using their computers for video gaming plus social networking on sites such as *Facebook* and *You Tube* (Rideiut et al., 2010, p.20). The majority of students in grades 7 to 12 spend more than 1.5 hours texting on their phones, sending an estimated 118 texts daily (Rideiut et al., 2010). While children do spend many hours outside of school on the Internet, all of their time spent online is not for social interaction alone. Increasingly, students are using the Internet to learn online with more than 50% of their online conversations directed to discussions directed related to formal schoolwork (National School Boards Association, 2007).

Online learning is quickly becoming integrated into student's K-12 learning experiences with continued growth expected in district programs, blended learning and mobile learning (Watson, 2010; Wicks, 2010). Online learning is expected to continue to grow linearly in the future, and "….the data suggest that in about six years 10 percent of all courses will be computer-based, and by 2019 about 50 percent of courses will be delivered online" (Christiansen & Horn, 2008, p. 17).Currently, there are myriad Web 2.0 (O'Reilly, 2005) tools that educators can choose to support K-12 online classroom learning. Several computer tools that students use for online learning are tools similar to the tools used with social networking and social publishing web sites. These computer tools allow students to post comments, upload images and share documents on the Internet. These tools support learning and provide space where learners

can connect with one another (Gunawardena, Hermans, Sanchez, Richmond, Boley &Tuttle, 2009; Greenhow & Robelia, 2009).

With the advent of social network sites and social media programs, many children have become adept in using networked technologies to make meaning of their world through interactions with others. The one common denominator that each of these technology tools have in common is the term "social," which is a key pedagogical reason to make these tools work with students. These web-based environments provide promise as a space where students have the opportunity to work together to form communities which can make student's online experiences richer as they feel membership in a scholastic network that satisfies their need to socialize while learning from others. There is promise for use of these technologies to support social communities for learning, if there is belief in their value.

Problem Statement

Today, students are using their smart phones and other mobile devices to communicate anywhere and anytime with anyone. Increasingly, grade school students are using the Internet as part of their everyday lives (Lenhart, Madden, Macgill & Smith, 2007). Weekly, more than 70% of children aged 9 to 17 are connecting with their peers using social networking sites. Interestingly, nearly half of those digital discourses are students talking about school (National School Boards Association, 2007; Lenhart et al., 2010). Their proclivity for technology use in everyday life has prepared this 'Google Generation' (Kaplan, 2009) for ease in using the Internet for online interactions and online learning, which is fortunate, because there is a real need for taking learning online. Online learning has the potential to transform schools by bridging student's social and technical skills with content area learning, thereby narrowing the network divide and paving the way for greater student achievement (Richardson & Mancebelli, 2011).

Online learning is one of the fastest growing segments in the educational arena. Online learning is growing at an annual rate of 30% (International Association for K-12 Online Learning, 2010). Since 2009, there have been an estimated 1,500,000 K-12 students taking online classes, representing a $507 million dollar market which continues to grow (International Association for K-12 Online Learning, 2010). Currently, 48 states offer online learning options for children, and 39 states offer public online schools (Watson, 2010). Online learning holds the promise to solve problems with declining educational budgets, declining numbers of qualified teachers and declining student performance in global competitiveness (Wise, 2011). Since the online world has a wealth of potential for learning, it is foreseeable that online learning will be an integral part of the learning paradigm for 21st Century learners.

Online distance learning has become an attractive delivery method for several reasons. For K-12 students, online learning is on the increase in-part because it offers students opportunities for personalized learning, advanced placement work, access to qualified teachers and credit restoration potential. It offers a convenient, cost-effective way to reach learners in an individualized manner (Christiansen & Horn, 2008; U.S Department of Education, 2009). Online learning also has the ability to reach students who cannot easily come to brick-and-mortar classrooms, and it can be utilized anytime or anywhere students have access to Internet technology. Additionally, online learning provides access to skilled instructors who otherwise would not be available to students due to distance, time or economic feasibility (U.S Department of Education, 2009; Watson & Gemin, 2008).

Since online learning provides potential solutions to so many educational challenges, it is advantageous for the educational community to determine how to tap the potential of this learning venue so that it can consistently produce successful outcomes for digital learners.

To capitalize on online learning in the primary and secondary school arena, and to prepare students for their online futures in higher education, educators must first be able to understand which educational factors and practices play a critical role in effective online education. This knowledge can help determine how to create and replicate desirable online learning community environments.

Unfortunately, much of the research that has been done in the effectiveness of online learning and the factors contributing to its success has been done in higher education, and herein is the problem (Poggio, 2011; U.S Department of Education, 2009). There are relatively few rigorous studies that have been conducted in K-12 online education (U. S. Department of Education, 2010; Wicks, 2010) that justify the success of online learning and the strategies for effective implementation. Yet, there are numerous grade school students today who are successfully using online learning for scholastic acceleration, enrichment, course credit and credit restoration (Watson & Gemin, 2008; Wicks, 2010).

With the advent of the Internet and growth of distance education, the role of community as a means for social learning has been researched in higher education (Hiltz, 1998; Rovai, 2002a; Sadera, Robertson, Song & Midon, 2009; Swan, 2005). Community has been presented as an answer in maintaining online student retention and the quality of learning experiences (Liu, Magjuka, Bonk & Lee, 2006; Rovai, 2002a; Sadera et al., 2009; Vesely, Bloom & Sherlock, 2007). The importance of community participation and collaboration in academic settings is connected to theories of social constructivist learning (Palincsar, 1998). Additionally, the role that socially networked communities play in allowing people from anywhere in the world to share their interests through technology has shown to be valuable for learning (Richardson, 2010), but how valuable? Social interaction and community formation have been attributed to

providing successful online experiences in higher education, but more research is needed to determine factors about communities at the K-12 level (Cavanaugh, Barbour & Clark, 2009). The need for more research in this area has prompted this study.

This research study seeks to answer three critical questions to uncover what remains to be known about the role that community plays in adding an integral ingredient to successful online learning, plus how to create and maintain these communities, specifically among K-12 students.

1. What are instructor beliefs about the role that community plays in online learning and what are the challenges to forming those communities?

2. Which methodologies and technologies do instructors use to promote a feeling of community for their online students?

3. Which artifacts of teaching provide evidence of the formation and continuation of digital distance education communities?

There is evidence of successful online learning communities practicing in K+ education (Ng & Nicholas, 2010; Zhang, Scardamalia, Lamon, Messina & Reeve, 2007), but how important is community to the success of K-12 learning? Research that *has been* conducted in K-12 online education reveals that when teachers foster student-to-student collaboration, it increases engagement among students (Smith, Clark & Blomeyer, 2005), and teachers find these student-to-student interactions beneficial (Ryan, 2007; Sadera, Robertson, Song & Midon, 2009). Student engagement in school related activities is important because it has been found to increase student learning (Zhao & Kuh, 2004).

So, is community the glue that binds individual online learners to commit to the contribution, distribution and creation of knowledge so that everyone in the community finds a benefit to membership in a scholastic network?

Now more than ever, while there is increased growth in K-12 online education, we need to know for certain the beliefs that instructors have about the role of community in online learning and how to create these online communities in instruction so that district course developers may consider this information in course design. "The fastest-growing segment of K-12 online instruction is made up of individual school districts that operate, or offer, online education programs for their students" (eSchool News Staff, 2010, p. 1).

This study will be informed by an examination of the literature of online communities in higher education (Hiltz, 1998; Rovai, 2002; Swan, 2005;Vesely, Bloom & Sherlock, 2007) and social network learning (Dawley, 2009; Gunawardena, Hermans, Sanchez, Richmond, Boley & Tuttle, 2009). It will also include K-12 online community research (Boling & Beatty, 2010; Cavanaugh, Barbour &Clark, 2009; Greenhow & Robelia, B., 2009; Ng & Nicholas, 2010; Smith, Clark & Blomeyer, 2005; Zhang et al., 2007). This study also identifies the elements found to be important to community formation (Rovai, 2002a; 2002b; 2002c) and the structural elements that support learning communities (Lave & Wenger, 1991; Wenger, 1998; Wenger, 2006). This study is important because research is needed to determine instructor's beliefs of the importance of community's role and how to create online learning communities from a pedagogical perspective (Liu, Magjuka, Bonk & Lee, 2006). Specifically, a study that addresses K-12 community issues is needed because K-12 learner's pedagogical needs may differ from the andragogical (Bailey & Card, 2009) needs of older students (Cavanaugh, Barbour &Clark, 2009).   Additionally, with the current rise of social networking and online learning occurring (Holcomb, Brady & Smith, 2010), there is a need to know if "new media forms have altered how youth socialize and learn" (Ito, Horst, Bittani, boyd, Herr-Stephenson, Lang, Pascoe &

Robinson, 2008, p.2). This information is important to determine the impact of community building tools for course development.

This research is a qualitative, multi-case study which includes teacher interviews and reviews of teaching artifacts. The principal area of this research study will be schools which offer exclusive online instruction where there are no opportunities for face-to-face interactions. Online instruction is defined as, "Learning conducted totally online as substitute or *alternative* to face-to-face instruction" (U.S. Department of Education, 2009, p. 9).

Conceptual and Theoretical Framework

This study is designed to determine online teacher beliefs about community's importance and their instructional strategies and methodologies that they employ to build learning communities. The study also looks at artifacts of teaching that show evidence of community formation.

The research study is framed using fundamental concepts of social-cultural learning theory. This research focuses on the importance of the role community plays in making scholastic social networks work as communities, mediated by technology, to provide online learning structures for K-12 students. This research draws upon the theoretical work of Vygotsky (1978), Lave and Wenger (1991) and Rovai (2002a). See conceptual framework Figure 1.

Vygotsky's social constructivist theory is the basis for this theoretical framework because this theory posits that learning from others helps learners learn more through their interactions with more knowledgeable others (Vygotsky, 1978). This study will seek to identify teachers' beliefs about socially mediated learning through their value and creation of communities which support online learning.

Throughout the study, community will be defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis in Rovai, 2002a, p. 1). Rovai's (2002b) classroom community concept, which quantifies student's feelings about connectedness and learning, guides this study. Rovai (2002a) has identified connectedness as one of the essential elements of community. Connectedness is an important component in the classroom community because it fosters student's spirit that they belong to a group and that they are not working in isolation (Rovai, 2002a). Connectedness also pertains to feelings of cohesion, trust and interdependence (Rovai, 2002b, p. 202). According to Rovai's concept of classroom community, factors of both community and learning are important components.

> Learning represents the feeling of community members regarding interaction
> with each other as they pursue the construction of understanding and the
> degree to which members share values and beliefs concerning the extent to
> which their educational goals and expectations are being met.
> (Rovai, 2002b, p. 202)

Rovai's work, which will be discussed in detail in the literature review, in part shapes this study because he looks at how teacher beliefs and values can stimulate the creation of online communities. Rovai states, "Educators who perceive the value of social bonds in the learning process must re-conceptualize how a sense of community can be stimulated in virtual classrooms" (Rovai, 2002a, p.1).

Like Rovai, Lave and Wenger (1991) also found community to be integral to learning. Lave and Wenger's (1991) work on building communities of practice (CoP) includes forming a

community, situated around a content area or learning domain for the purpose of improving practice. Their three-prong model of community of practice, which will be discussed within the literature review, situates learning with community as having equal importance to domain and practice. Lave and Wenger's framework was selected for this study because formal online learning is created through the creation of a class where students look to gain content area or domain knowledge through scholastic practices. The extent to which an actual community exists is what is looked at in this study. The conceptual framework of this study uses communities of practice as an academic structure, which combined with technology, forms a digital learning community (Wenger, White & Smith, 2009).

Online, digital learning communities have demonstrated that they can strengthen students' educational experiences because they promote online socialization, enhance student persistence and improve pedagogical practice (Rovai, 2002a). The case study research findings from teachers in this study will be viewed within the lens of Lave and Wenger's (1991) communities of practice. Teacher beliefs and artifacts derived from interviews and artifacts, which relate to learning will be attributed to Lave and Wenger's (1991) domain and practice structures. A modified Rovai's (2002b) community rating scale has been designed from a teaching perspective (Appendix C) to be utilized with teacher interviews and artifacts to determine evidence of the existence the community structure within Lave and Wenger's (1991) community's of practice model.

Chapter 2: LITERATURE AND THEORETICAL REVIEW

This literature review presents theoretical concepts of social constructivist learning to contextualize important concepts of learning with others. Review of alternate learning communities are included in the review (Brown's & Campione in Collins, Joseph & Bielaczyc, 2004; Gee, 2004; Gunawardena et al., 2009) to provide a comparison of alternate structures to support learning. Lave and Wenger's (1991) situated practice model and specifically Wenger's (1998) model of communities of practice are reviewed in depth, as the community of practice concept will be how the research data from this study will be analyzed. Gunawardena et al.'s (2009) framework for building online communities of practice to support learning is presented as a contemporary theoretical model that offers a similar conceptual framework to this study.

Since much of what is known about online learning stems from higher education (U.S. Department of Education, 2009), this review will include literature that substantiates that community development is known to be an important component in successful higher education online learning (Chickering & Ehrman,1996; Rovai, 2002a; Sadera et al., 2009; Vesely et al., 2007). Other community building factors such as Hiltz's (1998) theory of online collaborative and facilitative learning plus Swan's (2002) design theory are included. Additionally, the review will include the community factors that Rovai (2002a) has identified for successful online learning and how to measure its value. Rovai's community scale (2002b) will be another mechanism for data analysis in this study. Finally, this literature review includes what is known about forming online communities in K-12 education including the studies of Ng and Nicholas (2010); Ryan (2007), Zhang et al. (2007) and Zucker (2005).

Several notable online blended studies (Boling, Beatty & Partin, 2008; Boling & Beatty, 2010; Turvey, 2006) are also included in this review as the focus of the research analysis is on

the online aspects of the studies as opposed to the brick-and-mortar component. This information is helpful because it informs how collaboration tools have created online communities of practice. Current research on how students use the online world to socially construct meaning through the social learning processes is supported in the literature review which follows.

Social Learning

Social-cultural foundations of learning include the constructive perspective, which defines how learners construct meaning. The constructivist perspective of learning focuses on the process of constructing meaning to learn (Vygotsky, 1978). Two major schools of thought form the constructivist perspective: meaning is either individually constructed or socially constructed (Lever-Duffy & McDonald, 2011). Vygotsky's social constructivist view articulates that learning occurs initially through social interaction (Vygotsky, 1978) in which a group of learners share meaning and a common core of knowledge (Lever-Duffy & McDonald, 2011). Once individuals form their understanding through socially constructed knowledge, they can internalize it (Vygotsky, 1978) with the help of more knowledgeable others such as teachers and fellow students.

Vygotsky's Social Development Theory suggests that children move from a process of learning through social interaction to learning through individual internalization of knowledge. "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter-psychological) and then inside the child (intra-psychological)" (Vygotsky, 1978, p. 57).

Vygotsky believed that social learning starts as part of a child's early development. "Children's learning begins long before they attend school …Any learning that a child encounters in school always has a previous history" (Vygotsky, 1978, p. 84). Vygotsky's views

provide valuable insight into how his development theory may be applied in schools. Since he contends that learners come to school predisposed to learning from social stimuli, it is important that the educational community continue to build upon these socially constructed experiences in traditional and technically-enhanced classroom environments. According to Vygotsky, "Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalized, they become part of the child's independent developmental achievement" (Vygotsky, 1978, p. 91).

According to Vygotsky (1978), children also use cultural tools as part of their developmental achievement. Language is one of the primary cultural tools that children use to further their knowledge acquisition. When children communicate with others, they have the opportunity to learn at a higher level of achievement from more "knowledgeable others" (Bruner, 1997). Learning from more "knowledgeable others" or "more capable peers" is a component of Vygotsky's Social Development Theory (Vygotsky, 1978). Current Web 2.0 tools sites provide the technical and psychological tools (Vygotsky, 1978) necessary to further content knowledge acquisition.

Vygotsky's related zone of proximal development theory employs the use of "more capable peers" to help scaffold or assist with learning. The zone of proximal development is defined as "…the distance between the actual development level of potential development as determined by independent problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 76). Vygotsky's view suggests that students, when paired with more knowledge others, will gain greater learning benefits than that which can be achieved through their independent learning alone.

When a teacher presents tasks in the student's zone of proximal development

and then scaffolds, coaches, or supports the student in successfully completing

the tasks, the student's independence zone ultimately expands. This causes the

need for new tasks at a greater level of demand. (Tomlinson, et. al, 2009, p. 11)

Novice students can work with more knowledgeable "experts" in an apprenticeship role

before they move on the learning continuum to be considered experts themselves (Tomlinson et

al., 2009). This work can be carried out in online classrooms with a teacher and a group of

students acting as networked experts and novices interacting with each other in apprenticeship-

like relations (Zhang et al., 2007). Networked computers serve as physical devices that by

Vygotsky's standards are cultural tools which have the potential to create change within their

environment (Miller, 2009).The Internet allows global collaborations with peers and more

knowledgeable others from anywhere in the world. This is beneficial because it changes and

enlarges a child's learning environment. Computers can change the learning environment

allowing the formation of an online community of practice where children can work with others

using an apprenticeship model. "The term community of practice was coined to refer to the

community that acts as a living curriculum for the apprentice" (Wenger, 2006, p. 1).

Learning Communities

Lave and Wenger (1991) present the communities of practice model whereby learning

occurs through a situated process in which social communities of practice contribute to the

structure of the learning process. Learning is shaped by members of the community rather than

the individual.

Communities of practice are formed by people who engage in a process of

collective learning in a shared domain of human endeavor: a tribe learning

to survive, a band of artists seeking new forms of expression, a group of

engineers working on similar problems, a clique of pupils defining their

identity in the school, a network of surgeons exploring novel techniques,

a gathering of first-time managers helping each other cope…Communities

of practice are groups of people who share a concern or a passion for

something they do and learn how to do it better as they interact regularly.

(Wenger, 2006, p. 1)

Communities of practice have three components to their structure: 1) domain, 2) practice and 3) community (Wenger, White & Smith, 2009). The domain is the interest area that members have experience in and are willing to share knowledge with others. It is the reason that individuals join a community in the first place. "It has an identity defined by a shared domain of interest. Membership therefore implies a commitment to the domain, and therefore a shared competence that distinguishes members from other people" (Wenger, 2006, p.1). In an educational setting, a domain can be the creation of a community formed around content-area study. The community can be formed online using Web 2.0 tools. While an academic setting may not be thought of as a voluntary association expected in communities of practice, the choice to contribute and distribute knowledge does rest with each individual member of the community. In essence, experience and contribution help other members of the community whether the activity is for a grade or not. The personal identity of each member of the community is defined by their membership in the community. Lave (1993) contends that learning occurs through individuals identification with a group and states,

I propose to consider learning not as a process of socially shared cognition

that results in the end in the internalization of knowledge by individuals,

but as a process of becoming a member of a sustained community of

practice. Developing an identity as a member of a community and

becoming a member of a sustained community of practice. Developing

an identity as a member of a community and becoming knowledgeably

skillful are part of the same process, with the former motivating, shaping,

 and giving meaning to the latter…(Lave, 1993, p. 65)

The second component of a community of practice is the practice itself. Members in

communities of practice seek ways to improve their knowledge and practice of their craft. The

members gain knowledge from one another and from sources outside of the community in both

formal and informal ways (Wenger, White &Smith, 2009). "They develop a shared repertoire of

resources: experiences, stories, tools, ways of addressing recurring problems—in short a shared

practice. This takes time and sustained interaction" (Wenger, 2006, p.1). In an educational

setting, a community of practice may have informational peer-to-peer exchanges and offer

suggestions to one another to improve instructional assignments. In this practicing community

example, "more knowledgeable others" who are outside of the core membership, can supplant

knowledge for the group. These guest experts can provide lectures, mini-lessons or guided

practice for skill improvement. Inviting "more knowledgeable others" and experts to inform the

community can easily be accomplished with technology. Video conferencing software can

enable guest speakers to answer content related questions synchronously or asynchronously with

the addition of blogging or chat devices. McBrien, Jones and Chen (2009) found that when video

conferencing software was used in an online course, the students rated the course positively in

terms of social interaction and participation.

The third component of a community of practice is community itself. A community works together to learn from one another about the domain area that joins the members of the community together in the first place. "In pursuing their interest in their domain, members engage in joint activities and discussions, help each other, and share information. They build relationships that enable them to learn from each other" (Wenger, 2006, p.1). Relationships within the community become an important part of the learning.

> Learning together depends on the quality of the relationships of trust and
> mutual engagement that members develop with each other, a productive
> management of community boundaries, and the ability of some to take
> leadership and to play various roles in moving the inquiry forward.
> (Wenger, White & Smith, 2009, p. 8)

An example of an educational community of practice may include a community who meets over lunch in an informal manner and comments on each other's work. It can also occur in a formalized workshop, in either a face-to-face class or online communication.

Learning within a community of practice can exist with several levels of participation. "People participate in communities for different reasons—some because the community directly provides value, some for the personal connection, and others for the opportunity to improve their skills" (Wenger, McDermott & Snyder, 2002, p.1). Some members of communities of practice are core members who take an active role in the community. Others take on a more passive role in the community. There are some members who operate in the periphery or sidelines of learning and "lurk" at the inner operations of the communities (Wenger, White & Smith, 2009, p. 9).

Communities offer participants an opportunity to learn through what Lave and Wenger (1991) consider "Legitimate Peripheral Participation" in which members remain on the outer

edge of learning and may gradually take on a more active role as their competence level increases.

Community novices or newcomers can work on their practice with community experts to gain knowledge and to improve their skills until they may chose to become core members of the community. Core community members evolve into roles as old-timers, and the learning cycle continues when they acculturate newcomers to learn (Lave & Wenger, 1991). Some learners may choose to stay on the edge and use their knowledge as a member of another community. In an online class, students may view other member's written posts before they feel confidence to make their own written contributions. This research study looked for evidence that online courses have features which resemble communities of practice and the ways these communities had changed over time.

Communities of practice progress through life cycles. Like individuals who grow through a series of developmental stages, communities experience developmental growth. According to Wenger, McDermott and Snyder (2002), communities of practice move through a five-stage life cycle: Potential, Coalescence, Maturity, Stewardship and Transformation (Wenger et al., 2002, p. 69). The first stage is the potential stage in which communities begin with a social network formed around an important topic that individuals want to share knowledge (Wenger et al., 2002). This is the time when there is high energy to develop the community and to determine its full potential. Communities move into a second coalescing stage where the community forms a joint identity and establishes trust among members. During this incubation stage the community establishes the technical means for knowledge sharing and the true value of the community becomes apparent to members (Wenger et al., 2002). As the community becomes more established, it progresses into the maturity stage in which the community is fully formed. It is

within this stage that the true focus of the community is highlighted. At this stage, gaps in knowledge are identified (Wenger et al., 2002) by community members, and the community seeks to expand to fill those gaps. Expansion is established in the stewardship stage in which communities look to grow, add members and remain fresh in their ideas. The final stage of a community of practice is transformation. At this stage of the life cycle the original community may be put on hold or put to an end because it fulfills its mission. The community may merge into another community or create an entirely new community as needed (Wenger et al., 2002). In formal online learning environments, the community life cycle may end at the end of a course. In an online learning cohort model, the community can continue to exist.

Gee (2004) presents a variation of learning communities with his idea of affinity spaces which is a shared space for learning that can be situated in face-to-face or virtual environments. While there are some similarities between the concepts of communities of practice and affinity spaces: distributed knowledge, varied levels of participation and status within the space, there are differences that set them apart. It is important to look at what affinity spaces are as another social model of learning so that we may distinguish how they differ from communities of practice.

According to Gee, affinity spaces are places where people can go voluntarily to be with people who share "common interests, endeavors, goals or practices" but not demographics similarities such as "race, gender, age, disability, or social class" (Gee, 2004, p. 85). Within affinity spaces, people are drawn together by a common endeavor such as learning how to play a computer game, and they work within a portal, which can be physical or virtual. In affinity spaces, visitors can use authentic identities or manufacture their identity as with the use of a pseudonym as in an Internet chat room. Gee contends that meaning making can occur through chat rooms when there is a negotiation of what constitutes meaning. The meaning is socially

constructed by those in the chat room. "Meaning is something we contest over and negotiate socially. It is something that has its roots in 'culture' in the very deep and extended self that it resides in an attempt to find common ground" (Gee, 1996, p.13).

On the most part, Gee has been critical of the ability of modern classrooms to be able to produce affinity spaces. Probably one of the reasons for that is by his own definition, affinity spaces have content determined by the individuals (Gee, 2004). In an academic setting, unless the purpose of the online program is for creativity or enrichment, it is likely that the educator will determine the content. Also affinity spaces have tacit knowledge built within it. In comparison, in a community of practice, the knowledge may come from external experts (Gee, 2004). Affinity spaces do not appear to have the same life-cycle that communities of practice offer, which make them less attractive for a school model because of sustenance issues. Affinity space participants have the opportunity to drop in and out of the space at their own discretion while in formal academic settings it is not so easy to leave a course of instruction.

Since schooled-learning requires a planned curriculum, the transient affinity space model offered by Gee does not appear able to offer sustainability to support formal instruction in the same way a community of practice can offer students. There may be some academic endeavors where use of an affinity space can supplement learning, but affinity spaces are not a community model that easily fits with a formal school model. While Gee's (2004) affinity space model offers many attractive features for youthful educational enterprises, it does not have the structural permanence that Lave and Wenger's (1991) community of practice offers. It is for this reason that I will be analyzing data from teacher case studies through the lens of community of practice.

In his text "Situated Language and Learning: A Critique of Traditional Schooling," Gee (2004) presents a notable learning community model that resembles an affinity space and a

community of practice. This educational exemplar was established by Ann Brown and Joseph Campion in their 1990's brick-and-mortar classrooms supplemented by online interactions (Gee, 2004). Brown and Campion's work is discussed here because it presents contextual evidence that learning communities have been established at the K-12 level and that these instructional features can be considered in the development of new learning communities.

Brown and Campion's "Fostering a Community of Learners" concept for grades 1-8 (Collins, Joseph & Bielaczyc, 2004) consisted of teams of students who worked together helping other students to learn using a common curriculum. Knowledge was dispersed among the students using Aronson's (1978) jigsaw method. In this model learning community, the students majored in chosen areas, consulted experts outside of the group through e-mail and shared their knowledge with other students. At times the students took over the role of teacher. The community of learners progressed, not as cycles as is the case with communities of practice, but through phases with students eventually using Internet technologies to conduct research and establish mentoring relationships with experts (Collins et al., 2004).

Brown and Campion's design research eventually led to their published creation of "Design Principles of Learning to Support Fostering a Community of Learners" in 1996 which includes the following features: systems and cycles for activities; metacognitive and reflective environment; shared discourse; deep content knowledge shared expertise instruction and assessment and community features (Collins et al., 2004, p. 27). Brown and Campion highlight the following community descriptors which indicate that their students formed an authentic community of practice using technology: "community of practice with overlapping roles, blending of current practice with experts, elements of ownership and choice, and community beyond the classroom walls" (Collins et al., 2004, p. 27).

Some established community norms in the traditional face-to-face classroom can carry over to the digital learning community (Heuer & King, 2004), though developing an online class is not as simple as imaging what is found in brick-and-mortar classes and uploading it onto the web. There are factors which are unique to a virtual teaching with limited face-to-face interactions instruction (Cavanaugh, Barbour, Brown, Diamond, Lowes, Powell, Rose, Scheick, Scribner & Van derMolen, 2009). This is in-part what the research study looked to determine, how important are community factors in an online class and how do educators design for those community environments?

Social and physical environmental considerations are important for designing classroom communities (Fountas & Pinnell, 2001, p. 95). Designing for online communities may be impacted by differing needs for learners plus the opportunities brought about by changing technologies which can provide new spaces for learning.

Web 2.0 applications such as wikis provide the technical support for groups

to move forward toward collective intelligence in a learning environment, a

shared space in which a group of individuals can develop community, discuss

an issue of interest, and reflect on practice.(Gunawardena et al., 2009, p. 6)

Organizational structure has its place in the online classroom (McBrien, Jones & Cheng, 2009). Gunawardena et al., (2009) present Wenger's communities of practice model as a structure that supports learning through online social networking tools. Consistent with the concepts raised earlier, "The three structural elements of a community of practice… (1) domain, (2) community and (3) practice… can support… learning in social networking environments" (Gunawardena et al., p. 6).

Gunawardena et al. (2009) also see the social constructivist theory as the lens to view Web 2.0 technologies for community building. Gunawardena et al. have merged Vygotsky's zone of proximal development theory with Lave and Wenger's (1991) ideas and applied them to learning online with social networking tools to create a new model of "socially mediated cognition" (Gunawardena et al., 2009, p. 17) or shared knowledge. Wikis and blogs can be used for dialogue and sharing of experiences. The researchers see the connection to Vygotsky's theories of mediation with others through tools and contend, "The social networking tools we use will change how we think, how we learn, and how we interact with each other" (Gunawardena et al., 2009, p. 8). In their research Gunawardena et al. (2009) identify a six phase process for learning in a community of practice: "Context, discourse, action, reflection, reorganization and socially mediated cognition" (p.11). It is this last phase where the researchers see a group, rather than individual zone of proximal development (Vygotsky, 1978) emerge to help learners develop meaning from one another. They see the wikis and blogs as tools to reflect upon their ideas and to form a collective intelligence from the community of practice. Gunawardena et al.'s (2009) model was reviewed here because it uses the community of practice concept along with social learning technology tools to produce more knowledgeable others through the zone of proximal development theory (Vygotsky, 1978). The theoretical framework closely resembles my own framework, but Gunawardena et al.'s model seems more suited for informal learning environments because the theory relies heavily upon open learning networks rather than bounded academic courses (Wenger, White& Smith, 2009). Where I am most in agreement with Gunawardena et al. is how their social network spiral creates "socially mediated cognition" (Gunawardena et al., 2009, p.17). I believe that through participation in communities of practice, individuals become more knowledgeable individuals, go on to join other learning communities

of practice, and share their enhanced acumen with members of new communities (Gunawardena et al., 2009, p. 17).

Rovai (2002a) is another researcher who focused on community structures. In his study of fourteen college courses, half of the courses were conducted face-to-face and the other half delivered online through *Blackboard* course management technology. The study found that low feelings of community were felt in the courses that had the most structure but increased feelings of community were felt when there was more interactivity and dialogue in the course. Rovai concluded that the medium in which the courses were delivered did not matter, but the quality of the interactions is what mattered most. Rovai concluded that instructors should make instructional design for community an important objective. Rovai researched a methodology for classroom community measurement in another study.

In his other study, Rovai (2002b) researched 375 graduate students in 28 online courses using a *Blackboard* course management system. The purpose for the study was to analyze the validity of a test instrument that he designed to measure a sense of community in online courses. Rovai hypothesized that community is an important factor to measure because a feeling of connectedness reduced the likelihood of isolation associated with high drop-out rates in higher education. In this study he also sought to determine students' community experiences because his goal was to inform course designers about course features that would keep students satisfied and persisting in their classes. Rovai was influenced by Ashar's and Skene's 1993 work that found that community factors could have an impact on student retention.

Social integration had a significant positive effect on retention in a higher
education business program by creating a social environment that
motivated adult learners to persist. They found that learning needs alone

appeared strong enough to attract adults to the program but not enough to

retain them. (Rovai 2002b, p.198)

In his creation of a social rating scale, Rovai (2002b) identified important features to design an instrument that rated feelings of community using a five-point, Likert-like rating scale: "Feelings of connectedness, cohesion, spirit, trust, and interdependence among members" (Rovai 2002b, p. 201). An initial survey of 20 questions was developed rating these five elements. An additional set of 20 questions was added to the survey to address traditional and online classroom environments. The final Rovai Classroom Community scale was developed and consisted of 20 total items with only half of the question worded positively. The final test instrument measured overall feelings about community divided into two sub-scale sections related to connectedness and learning. The first question that measured connected was, "I feel students in the class care about each other" (Rovai, 2002b, p. 205). The first question that pertained to learning was, "I feel that I was encouraged to ask questions" (p. 205).

The instructors in the study were experienced online educators with two or more years of experience. The students were enrolled in education and leadership programs. Student enrollment ranged from 10-23 students per class. The overall findings of the study determined that the rating scale was valid, but there was large gender variability about the importance of community connectedness. Female respondents who made up the majority of the study rated community connected factors as more important than the male respondents. The findings suggested that more research is needed because connectedness factors may be related to communication styles, orientation to collaboration versus competition, or learning style differences.

Overall, I have been influenced by Rovai's research implications. I agree with his contention that community matters in online instruction and that researching online instructors and inquiring about their beliefs and practices about community features will provide insight and awareness of this important pedagogical practice. While Rovai's scale was designed for students, my research plan was to use the Rovai scale and match it to teachers' instructional beliefs and practice to find evidence of community building activities. "Proper attention needs to be given to community building in distance education programs…In a classroom community one requires both social and intellectual interactions to accomplish learning goals, supported through various interactive media" (Rovai, 2002b, p. 199).

Literature on Online Learning in Higher Education

In the online learning guidelines, routines and structures need to be in place to make a virtual space operate as a learning environment (McBrien et al., 2009). In 1986, Chickering and Ehrman published the "Seven Principles for Good Practice in Undergraduate Education" and later published another book in 1996, "Implementing the Seven Principles: Technology as Lever," to implement the strategies with newer technologies. Written more than fifteen years ago, their principles still serve as an important structural foundation to build online learning environments for all grade levels. The first two principles make it evident the communication and collaboration between students and faculty are of primary importance in a successful learning environment. Chickering and Ehrman (1996) state that these two principles include, "1. Good practice encourages contact between students and faculty" (Chickering & Ehrman, 1996, p. 3) and "2. Good Practice Develops Reciprocity and Cooperation Among Students" (p.4). Chickering and Ehrman also elucidate that students can use technology to work in teams, solve problems and exchange ideas. These collaborative opportunities remain for students and

faculty today, and several other researchers have proposed other recommendations for successful online learning principles.

Bailey and Card (2009) in their research of 15 college online instructors found pedagogical practices which have proved effective in teaching web-based courses: fostering relationships, engagement, timeliness, communication, organization, technology, flexibility and high expectations. Like Chickering and Ehrman (1996), Bailey and Card (2009) put fostering relationships first on their list for effective pedagogical practices. Cavanaugh, Barbour, Brown, Diamond, Lowes, Powell, Rose, Scheick, Scribner and Van derMolen (2009) found on a social level, teacher and student roles and relationships are principal features that contribute most to successful web-based instruction (Young et al., 2009). While teacher and student relationships have been reported to be important in online learning, Hiltz (1998) found that teaching and learning roles changed in online learning environments. Students must be ready to assume a role as an active learner and the teacher a facilitator of instruction rather than a transmitter for all knowledge (Hiltz, 1998). "…The role of the teacher changes from transferring knowledge to students (the 'sage on the stage') to being a facilitator in the students' construction of their own knowledge (the 'guide on the side')" (Hiltz, 1998, p.1).

Janicki and Liegle, (in Swan, 2002) identified "instructors acting as facilitators" (Swan, 2002, p. 24) as one of the top ten features which are important in the design of web-based instruction. The other features include: "… use of a variety of presentation styles; multiple exercises; hands-on problems; learner control of pacing; frequent testing; clear feedback; consistent layout; clear navigation; available help" (Swan, 2002, p. 24). Swan's research of 73 graduate level courses taken in the Spring, 1999, in the State University of New York Learner Network revealed that students believed that there were over 23 course design elements that

contributed to their perceptions about learning online. The three design factors which contributed most to student's overall satisfaction include —interaction with course content, interaction with course instructors, and interaction among course participants. Students reported receiving most value in online comments that were affective in nature such as humor, values and emotions. Online comments which showed community cohesiveness such as salutations, group references and course references showed the most benefit for community development. Swan also found that online verbal immediacy of comments among course participants provided greatest student satisfaction.

Hiltz (1999) also reported collaboration to be a key element in effective online learning at New Jersey Institute of Technology. In a research study conducted in 1997 using post course questionnaires submitted by 136 students who utilized online learning immediately following a graduate course, students revealed positive feeling about their online learning experience. "The results indicate that working in groups, instead of alone, significantly increases motivation, perception of skill development and solution satisfaction" (Hiltz,1998, p. 6).

The importance of student collaboration with one other is consistently reported as high importance to student perceptions about learning online. Students have come to expect that they can get and give input to each other in an online environment. This adds to the collaborative nature of online learning (Swan (2002). Liu, Magjuka, Bonk and Lee's (2007) study of 27 online students in an MBA program revealed that the social features of collaboration and community did matter to their feelings of engagement and satisfaction with the course. Those factors also resulted in reducing their isolation and likeliness to drop out of their online courses. Unfortunately, this same study also revealed that instructors and students did not universally have an appreciation for the importance of communities within their classrooms. Additionally,

this study revealed that instructors did not have the knowledge to structure online communities at the online class level.

There is a great deal of information available about the role of community in online learning environments in higher education. The studies reviewed here were those that looked at the importance that community plays in online learning, its importance to student satisfaction and features that create social learning within courses. The following review of K-12 online learning communities looks at online models and course design features that foster community creation.

Literature on K-12 Online Education

Online learning in K-12 is on the rise, and information derived mostly from higher education says that it is effective. The United States Department of Education's 2009 Meta-Analysis and Review of Online Learning Studies conducted a literature search of over 1100 online studies published between 1996 and 2006. It determined that 99 studies met the criteria for inclusion. The meta-analysis included 9 K-12 studies. While the report does say that caution should be used in generalizing the data for K-12 students, it concluded that online learning is effective.

> The overall findings of the meta-analysis is that classes with online learning
> (whether taught completely online or blended) on average produce greater
> student learning outcomes than do classes with solely face to face instruction.
> (United States Department of Education, 2009, p.18)

There are several notable success stories in K-12 online education. These successful programs have a track record of providing digital instruction that capitalizes on social interactions among students and teachers: Connections Academy, Florida Virtual School, K12,

Inc. and Virtual High School (Watson & Gemin, 2008). These school programs use Internet-based instruction exclusively or use a blended learning design which includes both online instruction and face-to-face instruction (Watson & Gemin, 2008). Blended models, where 30-79% of instruction is delivered online, are increasingly becoming more popular for instruction (Wicks, 2010).

Florida Virtual School, one of the largest providers of supplemental online instruction, has been operating since 1997. In the 2009-2010 school year alone, it provided more than 213, 000 courses to students in Grades 6-12 (Wicks, 2010). The school uses sophisticated computer programs such as interactive video conferencing, web cameras and computer simulations to establish socialization among students (Watson & Gemin, 2008). Michigan Virtual School uses *Adobe Connect Professional* and *Team Speak* video conferencing tools with World Language Classes (Watson & Gemin, 2008, p. 8). The Virtual High School Global Consortium and Hamilton County Virtual School in Tennessee uses less sophisticated but effective technologies, such as wikis and blogs, to foster social interaction in their courses. Connections Academy and K12™ use chatting for student socialization (Watson & Gemin, 2008, p. 9). Interestingly, some of these schools also offer online social activities such as clubs and summer face-to-face programs to supplement their online learning programs. In 2007, Odyssey Charter School added *Facebook* to its online school to foster interaction between students, but concerns over safety caused the school to move to a password-protected Ning, and the school continues to use social networking today (Watson & Gemin, 2008, p.14).

Social networking has been part of the fabric of teen life, and online educators are starting to harness the phenomenon as a way to provide greater socialization opportunities within the education framework (Watson & Gemin, 2008, p.15). Although the use of networking for

student socialization in an educational context is in its infancy, online schools are leading the way in demonstrating innovative ways to use technology in education (Watson & Gemin, 2008, p.15).

Virtual High School, a major provider of distance education courses for Grade 6-12 students, supports the belief that student interaction is critical to student success. Zucker's 2005 study (in Smith, Clark & Blomeyer, 2005) of eight online courses at Virtual High School looked to determine if he could measure the student interaction and collaboration at the school by assigning point values for digital discussion posts. His study determined that the majority of students did value collaborating with other students and finding out their point of view. Additionally, all of the teachers in the study found the collaboration beneficial for students, with the majority of teachers believing that the interactions were helpful for motivation and for learning course material. In the study, Zucker found that there was a wide variation of amount of interactions among students. He concluded that because the students differed in their academic motivation and prior achievement, it resulted in their number of posts (Smith, Clark & Blomeyer, 2005, p.51). Zucker recommended that further studies were needed to determine the benefit of collaboration. Additional research is needed because the quantity of discussion posts alone does not give a complete picture of the benefit of collaboration. In my opinion, the study was successful in terms of the factors of community collaboration that the students and teachers found beneficial.

In another study, Ryan (2007) set out to determine if web collaboration using social network tools could produce increased student achievement. In his study of 400 middle school students in grades six and eight, he found that the use of wikis, blogs and online discussion forums produced no increase in student achievement as measured by grades. Similar to Zucker's

findings (Smith, Clark & Blomeyer, 2005), Ryan found that students perceived more collaboration occurred in the courses using the web-based tools. He had also found that girls were more likely to use the collaboration features, which is similar to findings Rovai reported (2002b). It is important when assessing the value of online learning and when educators are designing their own online learning environments that grades alone are not the only measure to determine success. In online learning, other measures such as student satisfaction and course quality should be considered important factors for success as they can lead to increased course retention (Rovai, 2002a).

Zhang, Scardamalia, Lamon, Messina and Reeve's (2007) study of 22 fourth graders who formed an online Knowledge Forum in their study of optics found that the students benefitted from coalescing as a community. The Knowledge Forum was built on a multi-modal platform that included text, sound and video where students and teachers were able to exchange ideas. Scaffolds were used among teachers and students to support student knowledge building efforts. Data was recorded in knowledge portfolios that followed the growth of ideas generated as the result of the community working together. The researchers also analyzed inquiry threads and reviewed collaborative learning discussions. Zhang et al. found students in the study were able to understand deep content beyond grade level. The researchers concluded that a learning community should not only be concerned with collaborative knowledge but also collective knowledge. "Students are not only sharing and refining their personal knowledge represented as mental models but collectively create community knowledge-knowledge as a social product that has an out-in-the world existence and value to a community..." (Zhang et al., 2007, p. 60). Zhang et al. (2007) contend that collaborative learning environments should be designed to produce collective knowledge.

It is expected that districts will be designing more of the online courses in the future (Wicks, 2010). Course design can be expensive, and few educators have sufficient training to develop courses from scratch; however, the majority of schools continue to design their own courses (Oliver, Kellogg, Townsend & Brady, 2010). Unfortunately, little research exists in how K-12 teachers design online courses effectively. The published study, "Best Practices in Teaching K-12 Online: Lessons Learned from Michigan Virtual School Teachers," conducted by DiPietro, Ferdig, Black and Preston (2008) serves an effective primer. It is a model for elementary and secondary online teaching and lesson design. The study included interviews of 16 highly-qualified, Science, English and Math content-area teachers with three or more years of online teaching experience. The study sought to find out online teachers' beliefs about their practice because the researchers felt that there was little research from the perspective of online K-12 teachers. "In the relationship between teacher beliefs and teacher practice, experience emerges as a critical factor, functioning as a filter through which their beliefs are translated into practice" (DiPietro et al., 2008, p. 12). The research, conducted using *Adobe Connect* web conferencing software, revealed general characteristics and strategies which typified their online teaching work. "The strategies were categorized into sub-categories: Community; Technology; Student Engagement; Meaningful Content; Supporting & Assessing Students" (DiPietro et al., 2008, p.16). The categories in the study were similar to principles found in Chickering and Ehrmann's (1996) guidelines for good undergraduate instruction. Like the principles for undergraduates, community features are listed as an important consideration for teachers and their students in DiPietro et al.'s (2008) list. What was different is that these online K-12 teachers recommended a few behavioral classroom management strategies not found at the college level. Their classroom management issues pertained to inappropriate comments and posts

made during class discussions. Teaching in K-12 education is different and different designs are required.

In a study of eight teacher teams who were recruited to design elementary and middle school online courses for the North Carolina Virtual Public School System, several recommendations were presented that could help non-traditional online designers (Oliver et al., 2010). Teachers from the study indicated that they needed models and templates to design quality courses and specific professional development that addresses design issues. The teachers felt that instructors should be enrolled in model courses themselves and have the benefit of consultation with technical experts, face-to-face. The teachers in the research study felt the need for pedagogical advice to work with struggling readers, behavioral concerns and motivational issues. Overall, they felt it necessary for course designers to reconvene periodically to see the effectiveness of their courses and revise them as needed. It was also recommended that teachers follow established standards for online education published by the International Association of K-12 Online Learning (iNACOL). Consistent with Cavanaugh et al. (2007), it was also recommended that teachers provide collaborative learning opportunities for their students. The report concluded, "…the use of synchronous communication tools was critical for high school learners who lacked self-directedness in order to prompt, prod and motivate" (p.58). Two of the teacher teams in the study reported that younger students needed personalized learning environments that provide a great deal of social interaction and progress reinforcement.

Due to the cognitive and independent differences of elementary students as compared to older students, there are important considerations for designing online courses for younger students. In another study, Musgrove & Musgrove (2004) conducted research on a cohort of Master's degree students in a program in Education at Florida Atlantic University in their design

of an online elementary course. The college students in the study designed an online music class for students in Grades 3-5. The purpose of the class was to learn the recorder, and the online program WebCT was used to deliver the content. In the design of the course, students paid attention to structure and monitoring features to keep elementary students on task. The course was designed by providing content into chunks of information broken down into modules so that comprehension was increased. "One important difference between adults/older adolescents and their younger counterparts is in the area of Short-term memory (STM) capacity" (Musgrove & Musgrove, 2004, p. 217). Since young children have limited attention abilities, the course had a simplistic look because the college student designers were considerate of the student's cognitive load. "When designing online learning for children, background graphics, fonts and text layout all need to be simple and consistent. Complicated visual fields are likely to distract them [students] from the content on the page" (Musgrove & Musgrove, 2004, p. 218). The site has few animations and a consistent background so that children can navigate the site easily. Electronic breadcrumbs were also used so that students could find their way back to the beginning, and students were able to complete assessments linked to the site. Because of the developmental needs of the students, the online design was in linear, sequential order (Musgrove & Musgrove, 2004, p. 219).

This study was important because it was one of the few studies done on online education in an elementary classroom. The results of the study were very prescriptive in how online courses can be designed to meet the needs of younger distance education students. This study was also important because it substantiated that primary and secondary school children require specific instructional design features due to their cognitive developmental levels. Specifically, this study indicated that elementary-aged children required more social reinforcement in the

course design. This information is important because it reiterates the need for continued research on online learning for K-12 students because the models for college students may not apply to learning communities designed for children and adolescents. "There is a shortage of research exploring the development of K-12 online learning communities" (Cavanaugh, Barbour &Clark, 2009, p.1). Several K-12 online blended learning community studies are presented hereafter.

As discussed earlier, some of the largest and most successful private and public online schools use wikis and blogs to foster student community collaboration. "Blogs as they are known, are easily created, easily updateable Web sites that allow an author (or authors) to publish instantly to the Internet from any Internet connection" (Richardson, 2010, p.10). Blogs allow students to become "…effective and powerful writers with the latest classroom appropriation from online environments…" (Knobel & Lankshear, 2006, p. 72).

I have reviewed literature in the use of Web 2.0 tools for several years and have found a number of notable K-12 online communities (Pope, 2010). Boling and Beatty's recent research documented a successful K-12 online blogging community of practice which used *Moodle* technology. Their work involved a 2008 study of ten urban high school students in an advanced English class that utilized online technologies to provide formative writing feedback to one another. Their research demonstrated that K-12 students can establish a community of practice through their digital interactions.

The students in Boling and Beatty's 2010 study used a blended model of instruction and were supported with explicit teacher instruction plus comments on their writing by their teacher and fellow students. "By posting responses online and posting online feedback to each other, students gained insight into the types of knowledge and procedures that are needed to become a good writer" (Boling & Beatty, 2010, p. 54). In the 2008 study, Mrs. Young, the Advanced

Placement English teacher, developed writing prompts which increased with difficulty, and students were asked to respond to them online.

Boling and Beatty's (2010) research demonstrated that students learned what it meant to be a good writer through their online threaded feedback. Boling and Beatty also documented, over time, the written feedback students received was implemented when they revised their writing.

In their article, "Adolescent Literacy and Online Discussions: Enhancing Learning Opportunities in the English Classroom," Boling, Beatty and Partin (2008) wrote that Mrs. Young, the teacher in the 2008 study, utilized classroom time to model content strategies to improve student writing, such as the use of quotations and citations. The research indicated that Mrs. Young successfully created a learning community by bridging the brick-and-mortar classroom with the online blogs. "Interviews, classroom observations, and online discussions indicated that these face-to-face and online interactions supported the development of a classroom learning community where individuals were encouraged to take risks, explore with language, and support one another" (Boling & Beatty, 2010, p. 76). Throughout the study, students were able to integrate their personal lives into their writing, and classmates came to have a greater understanding of one another. The students worked to meet the high expectations that their teacher had for them and strived to improve the fluency of their writing. The students reported that they felt an improvement in their writing due to the ability to see a variety of writing examples and learn from them. The blogging medium made their learning experience possible and provided students with the opportunity to write for a large audience. Students reported that they became more aware of writing for their audiences.

Boling and Beatty's (2010) studies met the elements required for a community of practice. The community domain consisted of Advanced Placement English instruction. The students' practice was to improve their writing skills through input from the teacher and fellow students. The community was a blended model that bridged the traditional face-to-face classroom with online blogs. Boling and Beatty's (2010) model exemplifies that digital learning communities of practice do exist in K-12 learning and can thrive to enhance learner satisfaction and learner outcomes.

Research in K-12 online learning suggests that the online learning success is due in part to student's collaborative learning (Musgrove & Musgrove, 2004; Ryan, 2007; United States Department of Education, 2009). The point of my research is to look for similar types of practice that was seen in Boling and Beatty's (2010) study because it is a working model of a community of practice. My contention is that if teachers' beliefs show value for community building, they will provide a learning structure that supports a learning community of practice. Teachers who believe in the benefit of class community will situate learning around content domain. They will create features which invite community formation through the use of instructional strategies and methodologies. These teachers will provide a communal learning space where students can work with one another on refining their practice. Through this process of social input from others, belonging to a community of practice can inform students' practice and improve their products of learning (Ng & Nicholas, 2010).

Another successful online learning experience documented in K-12 education is the Ng and Nicholas (2010) case study of ten 14-year old gifted students from Malaysia and the United Kingdom who participated in a 6 month extracurricular scientific activity. The study looked at students' motivation to participate in the distance education program and the students' online

interactions. The program used a *Moodle* website which included scripted discussion forums, scripted chat rooms, resource areas and private discussion spaces. The scripted transcripts revealed that students performed as a community of practice when they helped one another through their dialog with one another, even in times when students were uncertain. Students formulated their own cognitive understandings and views based in part on impressions made from other students' perspectives. This case gives a real-world example to Vygotsky's theory that individuals are socially shaped from the outside and this is then internalized. Like the Boling and Beatty (2010) example, children in this study shared personal information that created a bond between them in much the same way students in brick-and-mortar classrooms bond. The Ng and Nicholas (2010) study had other important contributions to online learning due to the high completion rate among the course participants. The researchers recommended that a highly engaged, structured environment should be created from the beginning. Ng and Nicholas found instructors should be highly involved from the onset and gradually lessen scaffolds and supports once students demonstrate independent interactions (Ng & Nicholas, 2010).

Turvey's research (2006) is consistent with Ng and Nicholas's (2010) observations. Instructors must provide structure to support learning because student autonomy alone doesn't produce academic success. His 18-month research of sixth grade students in the United Kingdom documented a virtual online community that co-existed with a brick-and-mortar classroom. Turvey's study focused on four students in their formation of a virtual community designed for knowledge sharing and knowledge creation with the common ground to build web sites. Turvey analyzed the student socialization and personal identity formation and witnessed students learning on their own through active participation in their development of web pages. Turvey observed that students who prospered in the online world were also students who were self

directed in face-to-face learning. Turvey advocated that the teacher's role is important to permit academic learning (Turvey, 2006). Turvey found when teacher control was lessened and the activities were completed outside of school, more socialization occurred and less work production. He concluded that students should be given the opportunity to foster their socialization within the online world because it is personal what benefits these interactions can bring to the learner. "Authentic learning within virtual communities is often embroiled with issues of socialization and identity and it would be a mistake to attempt to reify or separate these" (Turvey, 2006, p. 319).

All three examples of K-12 virtual learning communities document how these scholastic networks can be created successfully. The examples show the importance of designing effective online classroom structures and the importance of teacher presence. These examples highlight hybrid uses of online learning, and through my research adds to the body of knowledge by illustrating examples of communities found in exclusive online instruction. I chose to interview instructors because they have experience with multiple students and their online class experiences. Research indicates that instructor beliefs about the role that community plays in online classes will impact their instructional design decisions, and that is the information that I am seeking in my study (Liu et al., 2007).

> Communities of practice sprout everywhere-in the classroom as well as
> on the playground, officially or in the cracks. And in spite of curriculum,
> discipline, and exhortation, the learning that is most personally
> transformative turns out to be the learning that involves membership
> in these communities of practice. (Wenger,1998, p. 6)

In my study, I looked to uncover whether instructors believe that their students will prosper by forming communities of practice within their classrooms. While there is some evidence at the college level that some students and teachers do not feel a need for community within their online classrooms (Liu et al., 2007), younger students show evidence that they want more community involvement (Musgrove & Musgrove, 2004). The literature has suggested that when students join together in learning communities established with social media, collaboration occurs between knowledgeable instructors and peers (Ryan, 2007). Through this process, individual learners increase their knowledge and skills (Boling & Beatty, 2010; Musgrove & Musgrove, 2004) and emerge as more knowledgeable individuals. In turn, individuals can provide benefit to other learning communities that they join. While there is increased call to attention to individualized learning, the socio-cultural need for working with others remains at the root of learning (Vygotsky, 1978) and must be enmeshed in the education process. This study establishes that online classrooms are fertile ground for communities of practice to sprout up.

Conclusion

Twenty-first century learners are using networked technologies as part of their everyday lives. They come to school with the knowledge and power to be able to communicate anytime or anywhere that they have access to the Internet. Children are using Inter-networked technologies for socializing and social learning (National School Boards Association, 2007). While students do spend much of their online time in discussions about school (National School Boards Association, 2007), it can be somewhat difficult technologically to independently form communities where students share interests and learn new practices. Since it is in the nature of students to learn through social mediation of meaning (Vygotsky, 1978), as educators we should do what we can to help students form online networks and to provide additional pathways to

learning, especially since online learning has shown to enhance student outcomes (Ryan, 2007).

Already online learning has become a fast growing segment in the K-12 educational arena (U. S.

Department of Education, 2009). It is foreseeable that students will be taking courses which

involve the Internet in either their later K-12 school lives or in college (Smith, Clark &

Blomeyer, 2005). Online learning has been established in college level coursework for more than

two decades (Harasim, 2000).   Educators can now take hold of the power of digital technologies

to engage our students after they leave the school bus. Rather than sending students off to finish

schoolwork alone, without social support, we can engage our students to form memberships into

communities of practice by their participation in online learning, blended learning or mobile

learning.

As teachers develop online materials to support their traditional instruction, they must be

mindful of the traditional classroom community building techniques that have been effective;

however, they must also design learning experiences especially for online environments

(Gunawardena et al., 2009). Teachers must be aware of the changing roles teachers and students

serve as members of an online community.

Community contributes to online learning success (Pallof & Pratt, 2005; Rovai, 2002a).

Members need to identify with the learning community, engage with the content and have a

sense of belonging to assist other members in their development (Wenger, 1998). Members can

take on different roles at different times as they shift from the periphery of the learning

environment and move to the core of the learning (Lave & Wenger, 1991). Some transient

members may be invited guests who help with their expertise as in the case of a guest author

meeting with students on a blog. Communities of practice allow for learners to learn from more

knowledgeable peers and to grow academically from collective knowledge of the community (Wenger, McDermott & Snyder, 2002).

There are many examples of successful online learning opportunities and communities created in K-12 education. Boling and Beatty's (2010) research provides an exemplar that distinguishes it as a K-12 community of practice. Their model illustrates how a class blog site can unite students in a community formed around a shared interest in a domain (English) while helping others to improve their scholarly practice. Boling and Beatty's model of a community of practice (CoP) is one that students can take into adulthood. It illustrates that within any learning community there are several teachers who can scaffold learning for them, and that they can do this in a reciprocal manner for other students as they themselves become experts.

In contrast, Greenhow, Robelia and Hughes (2009) argue that the lack of Web 2.0 integration stems from teachers' lack of modeling and knowledge to use these tools. While Boling and Beatty's (2010) model provides hope, consistent support must be afforded so that all teachers have the knowledge to move forwarded with online learning.

Much that is known about online learning is derived from studies done with higher education students (U. S. Department of Education, 2009). It is important to recognize that more research is needed in K-12 online learning. In the meantime, K-12 educators can move forward with the knowledge that the research that is available is impressive for students and well worth the time and resources to devote to creating digital learning communities of practice. While some students would rather keep their personal and pedagogical online spaces separate (Jones, Blackney, Fitzsibbon & Chew, 2010) in much the same way people keep their business and personal lives separate, many students would prosper if they transfer their social network

practices to scholastic learning networks found in digital communities of practice (Gunawardena et al., 2009).

Social networks sites like My Space and *Facebook* have been around for awhile (boyd & Ellison, 2007), and while there are a few K-12 schools using these social sites, many are not (Holcomb, Brady, & Smith, 2010). Even though students report that they enjoy the effort teachers go through to develop social network sites for learning (Mazer & Murphy, 2009), grade schools usually do not use these sites due to safety reasons (Barbour & Plough, 2009) and other school filtering issues (Richardson, 2010). There are additional options which exist for educators who want to safely and securely combine social interaction with curriculum content. Educators can utilize comprehensive course management systems such as *Blackboard, eCollege* or *Moodle*. A new era of social learning tools which are appropriately tailored for online learning environments are now in the academic mix. These tools represent a hybrid between social network sites, social media programs and course management systems. New learning websites include ePal's Learning Space and other tools (www.epals.com, www.21.com and www.edmoto.com), (Walsh, 2011). The issue is not which technology tools to use, but how to use these technologies to create learning environments which capitalize on social interaction, a key element that keeps teens online for hours each day (U. S. Department of Education, 2009).

Ng and Nicholas (2009), McBrien et al., (2009) and Turvey (2006) have all indicated that online learning structures are needed for effective learning to occur. Wenger et al. (2009) present a learning structure that can support an online community of practice formed around an academic domain. Rovai's (2002b) community scale has been shown to be an instrument that measures community in secondary schools (Wighting, 2006), and it will be used in this study so that the instructional design can be replicated, if warranted.

Chapter 3: METHODOLOGY AND DATA ANALYSIS

This qualitative multi-case study included teacher interviews and reviews of teaching artifacts from grade school online teachers, teaching in virtual schools. The overall goal of the study was to determine teacher beliefs about the importance of community as an adhesive element that keeps students connected to others and committed to learning with others in online classes. The study also looked at the methods that they used to support and build online communities. The interview questions and review of artifacts of teaching helped to determine which instructional strategies and techniques that experienced online educators used because they have found them to contribute to community building.

Research Questions

This study sought to answer three critical questions:

1) What are instructor beliefs about the role that community plays in online learning and what are the challenges to forming those communities?

2) Which methodologies and technologies do instructors use to promote a feeling of community for their online students?

3) Which artifacts of teaching provide evidence of the formation and continuation of digital distance education communities?

Researcher Role

Online gifted and talented instruction was chosen because I myself had expertise with the instructional tools that were available for creating online classes and online communities among the gifted population. I had designed and delivered these courses for several years. I had twelve years of full-time teaching experience in K-12 education, five years devoted to gifted education. I had had specific training in gifted education at the University of Connecticut and College of

William and Mary. I had been a Gifted Child Society Fellow and had provided professional development to teachers in this specialty area. I was not acquainted with any of the instructors whom I recruited, so I did not believe that my role as an instructor interfered with the data collection process. This population was an important one to study because a significant amount of online programming was available in the area of gifted education because online learning is well suited to serve the needs of the gifted student population (Thompson, 2010). This population was also an important one to study because more information is needed about online education for this student group (Thompson, 2010). Additionally, I felt equipped to conduct a study of instructors in general education as I designed and delivered ten online general education enrichment courses for a district-run program as part of a 2009 pilot study. I had also conducted another related research study on the use of Web 2.0 tools in instruction in 2010. I had also conducted previous research on digital communities of practice (Pope, 2010) which had informed this study. Throughout my career, I had taught at every grade level and I felt that this knowledge of child development would be helpful in my role as a researcher.

Since I had experience as an online teacher, I did have my own beliefs about the value of community in online learning. I had observed among young children (Grades 3-5) that community membership is what keeps students committed to participating in online learning practices. I had seen students grow academically through their interactions with others. I created learning environments that worked best for my students and that included adding social features to my courses. My bias about community was not a limitation of the study because I researched online teachers that taught outside of my grade level of expertise.

Additionally my bias about community's role in online learning was prevented from impacting my study because I recorded teacher conversations word-for-word and provided member checking opportunities for the participants.

Data Collection and Sources

Following Cresswell's recommendation (2007) to use detailed description to point out facts and settings in case study analysis, the chronology of the data collection process follows and is reiterated in this section. A case study qualitative research approach was used because it provided in-depth analysis about teaching beliefs and teaching practices. A case study here is defined as a "detailed, in-depth data collection involving multiple sources of information (e.g., observation, interviews, audiovisual material, and documents and reports) and reports a case description and case-base themes" (Creswell, 2007, p.73).

The data collection methods, interview questions, and artifact questions were influenced by the theoretical framework of this study. Since the study questions related to teacher beliefs and practices, those questions were posed through the lens of Rovai's community concepts (2002a) and Lave and Wenger's (1991) communities of practice. The interview and artifact questions related to teacher beliefs about community. Additionally, there were questions which related to the methodologies and strategies the teachers used surrounding their domain and their practice.

Site Selection

Site selection had been an arduous task in this research study. While there was little research available in K-12 online learning environments and although research is still needed in this area, (Cavanaugh et al., 2009), it had been difficult to gain permission to conduct research in K-12 online institutions. The sites that were desired needed to provide both gifted or advanced

level online coursework and general education online courses. Also, the sites that were desired needed to be well established institutions that were experienced online course providers. Additionally, it was necessary that the sites provided exclusive online programming as opposed to blended learning models. After several months and several attempts to locate appropriate sites that would grant permission to conduct research, two schools eventually permitted the studies.

The first research site was an online school which offered content instruction to middle school and high school students from the United States and abroad. This not-for-profit institution offered more than two hundred semester courses to students in over 30 states and 50 countries. This institution had been well established in general education online learning and it offered a gifted and talented component to their online offering. This school will be referred to as Web School 1 throughout the study.

The second research site in this study was an institute of learning which offered several options to serve gifted learners including face-to-face course programming. It was a K-12 arm of a university which had decades of experience in providing distance education options for elementary through college level students. Grade school students in this school were from the United States and countries around the world. This school heretofore will be referred to as Web School 2.

Participant Selection

The sample consisted of eight online instructors chosen from a population of online instructors who taught online general education plus gifted and talented learners. Gifted and talented instructors were selected to be among the population studied for a few reasons. These instructors were selected primarily because they served diverse learners who were statistically the largest population of online students (Smith, Clark & Blomeyer, 2005). These instructors

were principally teaching gifted learners who sought course acceleration but their students may have also been part of another diverse group such as the homeschooled or homebound (Smith, Clark & Blomeyer, 2005). Secondly, the gifted and talented instructor population was chosen because online gifted and talented education had provided evidence of positive results which warranted replicating since gifted students were reported to be well suited for online education (Thompson, 2010; Wallace, 2009). Even though the programming may have been costly and competitive, students who participated in gifted and talented online learning selected this venue for course programming voluntarily as opposed to the need for credit restoration. These students may have chosen to participate in online programming due to limited educational alternatives at their academic level, but it was still an elective choice. In fact, students in the online gifted and talented education arena were frequently accepted into competitive online programs based upon their abilities to achieve competence in the 95% range in nationally norm referenced tests or who perform above grade level (Thomson, 2010). Students who participated in the gifted programs may have been traditional face-to-face learners and may take one or more courses online for credit supplementation or enrichment even at their own school.

General education instructors who taught for an online high school were also part of the study. Their students were high school students taking classes for course credit and advanced study credit. Students may have also taken courses through the online high schools because they lived in rural areas or areas where desired courses were not available at their local schools (International Association of Online Learning, 2010).

Instructors of Grade 6-12 students were targeted for participation in this study due to the abilities of students within this age range. Students within this grade range typically have the

physical and cognitive abilities to master the online technical tools and to fully utilize the social learning course features (Musgrove & Musgrove, 2004; Wallace, 2009).

The online instructors were recruited using an e-mail recruitment flyer which asked for the instructor's consent to participate in the program. The first research site, Web School 1, requested the interview questions in advance and they eventually granted permission for the research study. The participant recruitment letter was directed to the administrator and forwarded to instructors. The administrator provided contact information for five instructors who had agreed to participate in the study. The five instructors from this school were high school teachers, and the students that they served were, on the most part, in grades 9-12. The subject areas represented include Honors Anatomy and Physiology, Honors Genetics, Honors Psychology, Advanced Placement Spanish and General Engineering.

Once the instructors granted consent, interviews were arranged with the instructors who resided in several states within the United States. I opened up an *Adobe Connect* account exclusively for the use with this study. I sent an e-mail interview invitation along with the web site link for the *Adobe Connect* program. We met online for an interview at an agreed upon time.

The second online high school subsequently provided permission to interview their staff. As was the case with the first site, the interview questions were submitted in advance. A senior faculty member provided the first interview and thereafter referred three other staff members to me to conduct interviews. Two others responded to my request and granted interviews; one did not respond to my requests to grant an interview. I arranged for the interviews by sending an *Adobe Connect* link to the instructors which indicated the date and time of the mutually agreed upon interview appointment. The subjects taught by these instructors included core science courses, advanced level mathematics and history courses. All of the *Adobe Connect* interviews

were one-on-one interviews. In no case did multiple people log-in during the interviews. I used my web cam to transmit my live image for all interviews. Two instructors used their webcams to transmit their images, although this was not requested in advance. I did not want the lack of a webcam to prevent an instructor from participating in the research. All of us used our microphones during the interviews.

Instructor interviews. Five instructor interviews from one school and three interviews from another school produced a total of eight recordings, which were the primary data sources used to address the first research question, "What are instructor beliefs about the role that community plays in online learning and what are the challenges to forming online communities?" I transmitted my video image to conduct all of the interviews.

The instructor interviews began during the Fall semester at Web School 1 and were completed at Web School 2 during the Spring semester. I interviewed the instructors using a series of mostly open-ended questions found on the attached instructor interview questionnaire form Appendix A. The questions were selected to determine instructor beliefs and expertise in online community building. The first question related to community since this is the major theme of the study. The remaining questions were segmented into nine themes which were consistent with the research of Bailey and Card's (2009), "Effective Practices for Online Teaching." Questions that pertained to communication, engagement, high expectations, organization, social formation, technology, flexibility and timeliness were also part of the study. Questions that pertained to each category in Bailey and Card's (2009) research were used to give a complete picture of the course with at least one question in each area.

The interview questions were designed to indicate instructor beliefs about the value that they felt community provided in online learning. Ertmer (2005) found that teacher beliefs,

especially about technology use, impacted their instructional practice. The questions that I asked gave me an understanding of the common meaning of how community can be defined and what a community looks like: "How would you define community in an online classroom environment?" and "What are some of the features that you believe that a community contains?" I then asked about specific instructional components such as "Please describe your class size and structure" and "Which type of technologies do you use in the course?" I asked teachers to frame their course specific answers around one course that they taught at the time of the interview. The course choice was at the discretion of the teacher but the instructors only taught one or two courses per semester.

The web conferencing program was effective because it enabled an audio recording to be made through a web site using the instructor's microphones and their computers. The first two interviews served as a pilot to determine if the interview instrument was usable for the remainder of the interviews or if the interview instrument needed adjustments. The instrument seemed suitable to be used with the rest of the interviews so the instrument remained unchanged. I determined the instrument was suitable because the respondents understood the nature of the questions and the questions elicited the type of responses that I was looking for from the interview. The technology was working effectively too, so I continued using *Adobe Connect* for the remainder of the interviews. Each of the interviews was conducted on a one-to-one basis. Each person was interviewed only once. Interviews ranged from 22 minutes to 50 minutes in duration. Two of the instructors in Web School 2 used their video cameras in the interview however only the text was transcribed from all of the interviews.

Following completion of each of the interviews, artifact reviews, and website reviews, a teaching story emerged from each participant in the study. Immediately, analytic reflections were

made to gain an early or preliminary analysis of the data (Cresswell, 2007). The analysis of each

data source follows in the section ahead. I consolidated the information that I had for each

teacher in the case study and clarified the points that I addressed in the research and which

required elaboration. I attempted to fill gaps in my understanding so that I had a thorough picture

of the teaching and learning practices within these courses studied. I did exercise the option to go

back into the field to clarify questions to get more complete information not obtained the first

time around from the interviews.

<div align="center">**Data Analysis Overview**</div>

When the raw data collection was complete, I constructed a case record (Patton, 2002)

grouping the data from each instructor's case study. A case study is defined here as a,

"… readable, descriptive picture of or story about a person, program or organization and so forth,

making it accessible to the reader all of the information necessary to understand the case in all its

uniqueness" (Patton, 2002, p. 450).

Interview Questions

Interviews were coded initially by how the responses answered the three main questions

of the research study: their beliefs, their methods and their practices. I saw how their answers

related to the communities of practice (Lave & Wenger, 1991) model: community, domain and

practice. Rovai (2002b) has developed a community rating scale that measured student's feelings

about their classroom community. This 20 point rating scale, which measured classroom

connectedness and learning, was an instrument utilized to analyze teacher case studies. I used

Rovai's scale (2002b) as an instrument to look at the community facets and interpret the data of

the instructor responses and how they matched up to Rovai's community related questions where

possible. The redesigned Rovai scale questions are included in Appendix C. They are redesigned

and changed from a learning perspective to a teaching perspective. I used the scale to interpret community features from the teacher interviews and artifacts. I gave a rating on a scale of 0-2 for evidence of community: a rating of 2 for Strongly Agree that community is present, a rating of 1 for Agree that community is present and a rating of 0 for Neutral if there is no evidence of community features exist. I also used the instructor interview questionnaire which is included in Appendix A for analysis. I noted specific scripted texts that exemplify their feelings and practices as it relates to domain, community and practice.

Artifact Analysis

Artifact analysis included review of the technical teaching tools using the pre-established artifact questionnaire shown in Appendix B. This analysis identified technological teaching tools plus the type and degree of community building features each tool provides. I sought to answer through review of the artifacts, their relation to the research questions of the study. The artifact questions which correlated to research questions are included in the Appendix. I coded the artifacts to evidence of community of practice. Items which related to community, domain and practice were coded. I also looked to see if the items related to Rovai's (2002b) scale pertained to the artifacts.

I used inductive data methods to analyze what appeared to be happening in each of the instructional cases and deducted the data which fit into my theoretical framework for the study (Patton, 2002). I sought to identify emerging themes presented by each instructor's interview and observation of the set of artifacts. I formulated themes identified from each of the instructor's data sources. I grouped the items according to similarities and trends and coded them using a within-case approach (Creswell, 2007). I used a "lean coding" (Creswell, 2007) approach with the identified codes threaded to the research questions and theoretical review area of community

of practice: domain, practice and community. Topics which emerged with frequency were grouped together. Once I coded the research from each instructor, I wrote a complete case study narrative detailing each instructor's story. Then I reviewed the data from each school. Afterwards, I completed a cross-case analysis to see where cumulative patterns could be detected from the data. A categorical aggregation provided an opportunity for the comparison and collapsing of the data into several themes (Creswell, 2007) consistent with the lens of communities of practice. Once the data were displayed and organized into the major themes, conclusions were drawn from the data.

My methods of analysis, specifically matching each interview and artifact guiding question to the research question, made certain that there were data solicited and analyzed for each research question asked.

My conceptual framework informed my data analysis because I looked at how the data fit into the community of practice model. I also looked to find if there was evidence that the instructor's community formation pedagogy paralleled any of the features Rovai (2002b) reported to be indicative of community building.

When I wrote the multi-case final analysis, I used the metaphor of building a learning community with each instructor's qualitative case study representing another story in building a community of practice. I believed that the metaphor gave a concrete example using the physical reference for an online space. The conclusions were made from the major findings of the study. These findings provided the meaning that the research contributes in determining the importance of the study for K-12 online learning, implications for teaching, and the need for continued research.

Detailed Data Analysis

The remaining chapter will discuss the detailed data analysis including a review of the in-depth coding techniques and the rational for their use. In particular, the chapter discloses information from the Instructor Interviews, Public Web Spaces plus Artifacts of Teaching, which were the principal data sources used to answer the three research questions.

Question 1

The spoken words from the *Adobe Connect* recordings were later transcribed and imported into *Dedoose* for coding. The *Dedoose* ([www.**dedoose**.com](www.dedoose.com)) web application was used for qualitative analysis since it permitted the construction of case records (Patton, 2004) and grouping the data from each instructor's interview. Interviews were coded based upon Bailey and Card's (2009), "Effective Practices for Online Teaching," themes which were used in the interview questionnaire. The effective practices pertained to communication, engagement, high expectations, organization, fostering relationships, technology, flexibility and timeliness. Additionally, each instructor gave their definition of what a community meant to them. The transcripts were excerpted based on comments that elucidated a definition for community, community related themes plus course organization. For each of the nine questions asked of each instructor, the responses were coded with nine codes as illustrated in Table 1. Several of the questions, with several of the instructors, had overlapping themes.

Interview comments were excerpted or trimmed from the original lengthier interview passages. The main points of the comments were maintained but the extraneous words were edited. From the total interview responses excerpted (n=360), the majority, or 18% pertained to organization of the course. The remaining items pertained to community related themes. Thirty-eight excerpted responses or 11% of the comments were comments related to community. A

comment for this study is defined as a sentence or string of sentences that were given in response to specific interview questions and were later excerpted and attributed to one of the nine Bailey and Card (2009) themes identified. The excerpts as well as the transcripts were reviewed and deducted to produce one complete definition of community articulated from each of the participants. This definition was obtained to provide an understanding of what is meant by teachers when they convey their beliefs about community and its importance in their practice.

The definition for community was reviewed within the context of Lave and Wenger's (1991) communities of practice construct which is one of the conceptual frameworks that shape this study. Table 2 indicates which teacher comment reflects evidence of community, practice and domain. Additionally, this table identifies the teaching grade level, class size and subject matter.

Rovai's concept of classroom community (2002b) was also used as a lens to view the interview data and answer research Question 1. A modified instrument based on Rovai's Classroom Community Rating Scale was developed. Typically the Rovai Scale is conducted by college students at the end of a semester, and it is based upon their perspective as a learner. This scale was modified from a learning perspective to a teaching perspective. All of the 20 questions are stated in a positive manner rather than some of which are negative statements in Rovai's original scale. The scale that was developed for this study has a maximum value of 40 rather than Rovai's 80 score. This new instrument was developed to look at factors which Rovai has identified as important for community building and learning. The odd numbered statements 1-19 relate to community including connectedness, cohesion, spirit, trust and interdependence (Rovai, 2002b). The even numbered statements refer to learning. Each one of the teacher interviews were analyzed for remarks that they made that would show evidence to rate the remark as Strongly

Agree, Agree or Neutral as it related to items identified on the scale. For example for the item,

"Student's educational needs are being met," the statement "Different teachers make use of

different features based on what the needs of the class are," exemplifies that item. The response

was given a Strongly Agree rating or 2 points in that category on the modified Rovai Scale.

Remarks that typified each of the twenty categories were recorded for Web School 1 and Web

School 2 cases. The overall ranking of 22 out of 40 possible points measuring community and

learning was obtained by Web School 1. Web School 2 produced a score of 28. More important

were the comments that were obtained as a result of using the Rovai scale filter for analysis.

Further discussion about the Classroom Community Rating Scale will be discussed in the

Findings section.

Finally, the two instruments: the Interview questionnaire which posits the Bailey and

Card (1999), "Effective Practices for Online Teaching," and the modified Rovai Classroom

Community Rating Scale (2002b) produced enough data to answer the first part of the research

question. Determining the challenges in building an online community required "going back into

the field" to get that data (Coffey & Atkinson, 1996). While some road blocks of community

formation were identified in the initial interviews, once the data was reviewed, it was determined

that more data was needed to answer this second part of the question more fully. When asked

specifically about roadblocks to community formation, teacher's answers ranged from "students

not completing work on time" to "cheating." Initially, some of the roadblocks could only be

inferred, such as comments that students were having "difficulty with computer programs" and

teachers heard about "inappropriate language during chatting."

Once the data was available from the interviews and the modified Rovai Scale, the data

had to be further deducted and segmented by each case. All of the terms in Bailey and Card's

(1999) work used on the interview instrument were defined, and examples are provided in Table 5. The items which relate to Community, Technology, Engagement, High Expectations and Flexibility are discussed, and exemplar comments for each of these areas are presented in the findings to elucidate teacher beliefs about community and the challenges to creating online communities. Finally, exemplar comments that were derived from the modified Rovai Scale which relate to community connectedness were reviewed for evidence of teacher beliefs. Through this process of looking at the interviews through two theoretic filters, Bailey and Card (1999) and Rovai (2002b), the most profound themes emerged to illustrate teacher beliefs about community. What remained were the themes that stemmed from instructors' definitions about community, "connected spirit, trust and interdependence" which Rovai previously found to be important for community formation (Rovai, 2002a, p. 1). An additional theme that emerged was the responsibility for active participation in the community for learning. This additional theme is still consistent with Rovai but goes back to the original conceptual framework shaped by Vygotsky (1978) and Lave and Wenger (1991). The theme of community participation is a larger concept than community alone; it also relates to the practice of the community. The concept of domain was documented in several of the interview responses and is consistent with Lave and Wenger's Community of Practice construct (1991). The Findings will discuss how communities of practice are documented in each of these case studies and the commonalities of communities of practice shared by both cases.

The Communities of Practice framework highlights how the Spirit of Connectedness, Trust and Interdependence are part of the community mix that the case study instructors defined community to contain. Community participation, believed to be an integral part of the community function, relates to practitioner or community member skills (Lave & Wenger,

1991). The domain is the purpose for the gathering, in these cases, the online classroom is a digital domain. The domain is the scholastic structure which "houses" community membership and participation in practice skills (Lave & Wenger, 1991). This metaphoric house supports the Digital Distance Learning Community framework, which is the name of the framework that combines all of the learning theories which underpin this study and illustrated in Figure 2. This is discussed within the Findings, along with a detailed description of Spirit of Connectedness, Trust and Interdependence.

Question 2

Question 2 data analysis began once a definition of Community and its challenges were identified. Question 2 was constructed to answer, "Which methodologies and technologies do instructors use to promote a feeling of community for their online students?" This question was answered by looking at the information from, chiefly, the themes presented in the interviews and observation of the teaching artifacts. An Artifact Observation form (See Appendix) was used to review the physical artifacts from each of the Case Studies: Web School 1 and Web School 2. This data was segmented to be able to provide a cross-case analysis between the two schools. The form helped to answer questions about methods and strategies including, "Which structures support learning and teaching of the online classroom?" and "How do these structures support independent learning?" This complex answer is presented in the Findings section and includes many of the concepts Rovai (2004) identified as important factors for distance learning, including Moore's (1993) paradigm of Transactional Distance.

Analysis of the methodologies and technologies was conducted using questions 1-8 from the interviews, specifically questions that related to Organization, Technology, Engagement and Timeliness were reviewed. The Artifact Observation form provided a medium for consolidation

of the information from the interviews and the artifacts themselves. Once this data was reduced,

it provided information in three key areas that relate to community practices: 1) synchronous and

asynchronous collaborative technologies, 2) class activities and 3) classroom rules. This data will

be discussed within the context of each case in the Findings section. Details of this data can be

found on the Consolidated Case Artifacts Form.

Question 3

Question 3, "Which artifacts of teaching provide evidence of the formation and

continuation of digital distance education communities?" was answered by review of the artifacts

and the interviews. After review of the artifacts alone, it was determined that this question could

not be answered in isolation because the physical teaching tools themselves could not tell the

story of what was happening within the context of the classroom. While both schools have

elaborate websites which depict learning content, the examples in themselves could not answer

the question about the evidence of formation nor continuance of learning communities. First and

foremost, the research had to reveal that communities by definition were formed and existed to

answer the second part of the question about evidence of the continuance of the communities.

Heretofore, the working definition for community has been for this study, "a feeling that

members have of belonging, a feeling that members matter to one another and to the group, and a

shared faith that members' needs will be met through their commitment to be together"

(McMillan & Chavis in Rovai, 2002a, p. 1). Interview data from questions 1 and 2 provided

enough evidence within the aggregate cases that members felt a sense of belonging, "It's really a

sort of meeting of the minds-so they can belong to this community in this online environment…"

The instructors have demonstrated that community membership matters with comments such as,

"They do share with each other." The instructors have shown that the students had faith that

members' needs will be met with comments such as, "We find that students are supportive of one another."As far as a continuation of the community, there was evidence from interviews in Web School 1 that student issues regarding their "maturity," "honesty," and "appropriate participation" threatened community formation. But those concerns were not present in all of the courses. Some students were reported to have used social-network sites like *Facebook* and *Skype* outside of school. Use of these digital tools and practices outside of school showed promise. It indicated that communities can be transformed into new communities in the future.

What was needed to answer this question 3 required a review of the conceptual framework and theories surrounding community. After looking at the theories of Rovai (2002b, 2004), Lave and Wenger (1991), Bailey and Card (1999), a review of artifacts which demonstrated the existence of classroom peer review, honor codes, timeliness and communication attributes is what supported community formation. These documents related back to the aforementioned data determined to form communities: connectedness, trust and interdependence (Rovai, 2002a). Evidence for the continuance of communities was ascertained from the interviews where instructors discussed students who worked together on *Facebook* and *Skype*. As Lave and Wenger (1991) contend, there are five stages of communities of practice. The end of a course usually means the transformation stage (Wenger et al., 2006). The *Facebook* and *Skype* using students have the communication and collaboration tools already to transform their online class community into a new learning community. This discussion is continued in the Findings section.

The formation of communities was documented through the instructor perspective alone. This is discussed again in the Limitations section as it was a limitation of the study. Since it is not known if the students actually felt that they were part of the community because they were

never interviewed and no data was collected from them. This study only revealed teacher opinions about community plus evidence of practices that supported and promoted community formation. Access to online student data within the courses was not permitted. A prior study indicated that access to this subject group is difficult to obtain.

Conclusion of the data analysis occurred when all of the research questions were answered sufficiently. The data indicated teacher beliefs about the value of community and the hardships in forming them. The data revealed the instructional methodologies, strategies and technologies that the instructors used in their practice. The data also revealed the artifacts that instructors used to form and foster communities. There was sufficient data to support the conceptual framework that communities of practice are the structures that hold online learning classes together. Community, and its constituent pieces, played a major role as a foundation of the communities of practice model. The data from each of the two case studies told two very different "stories" in "building online communities of practice." The Findings section will include the results that show how the stories of Web School 1 and Web School 2 are different and how they are the same. These Findings provide information for continued discussion and potential implications for practice.

Gaps that existed in the data included the need for more visual inspection of the artifacts of teaching including exposure to the *eCollege* platform. The Rovai Scale (2002b) may in itself have been the ideal instrument to drive interview questions and would have required instructors to respond to 20 questions in an interview. The length of the interviews may have been sufficient. While data provided from students about their feelings of community would have been helpful, overall, the data collected provides sufficient information to present teacher beliefs

about community and the methodologies that they use to sustain it. Further discussion can be found in the Findings section.

Validity

The multi-layered data collection approach, consisting of interviews, artifact observations and artifact reviews were planned to increase the validity of the research results by providing triangulation through the collection of different kinds of data (Creswell & Miller, 2000). Additionally, the use of member checking, although not used, was also intended to provide additional validity to the research project. Detailed transcripts were provided to the participants for their review. Although the participants were given transcripts of their interview comments, they chose not to make any changes.

Limitations

The instructors in the study were asked to discuss their beliefs based upon their student population from Grades 9-12 classes only. Working with instructors providing high school content alone was a limitation of the study. The results of this study's sample may not be generalized to instruction of younger student populations in grades K-8.

This research also looked exclusively at coursework that is delivered online through a virtual school and virtual instruction only. This research did not include blended models of instruction which includes a combination of face-to-face instruction and online instruction. The rationale for this limited focus is that with online instruction alone, instructors must employ instructional strategies to build communities without the benefit of face-to-face interaction. This study wanted to isolate those social and community features that can be created online, alone.

Finally, a limitation of the study is that it focused upon teacher beliefs and practices alone but did not include student beliefs or student work. A student perspective would provide a more

complete perspective of the role of community in online education. It would have been helpful to have included student comments in the study, specifically when answering Research Question 2, and to look at the feelings of community that instructors built for their students in their courses. Students were not included in this research study because of the difficulty in obtaining parental permission from this research population, which was experienced in a prior study.

Chapter 4: FINDINGS

Introduction

The results from two case studies that explored the role of community in strengthening K-12 online learning are included in this chapter. These findings reflect teachers' beliefs about the role that community plays in their online learning classes and teachers' practices in incorporating pedagogical methodologies to form learning communities. The findings presented here include interpretations from data collected from eight instructors employed by two online schools. This chapter includes specific teacher comments from interview questions, teacher comments applied to the modified Rovai Classroom Community Scale (Rovai, 2002b), and analysis of teaching artifacts. Each school in this study was bound into a separate case study.

The findings are organized by the three main research questions using a within-case and cross-case approach (Creswell, 2007). A house metaphor is used throughout this section to provide a concrete example for how instructors structure their online classrooms. Each web school represents one story in building a digital learning community.

This research uncovered teachers' beliefs, methodologies and technologies used in these courses to create digital learning courses. Overall, the findings of this study support the premise that community is the glue that keeps K-12 students connected to others in these online learning environments. This study found three major themes about community that surfaced: Trust, Spirit of Connectedness and Interdependence (Rovai, 2002a).These themes will be discussed throughout the findings. The findings illustrate that communities of practice were the support structures that formed within these case study online classes. These communities provided content area learning within domain of knowledge. These two case study schools told two very

different stories about building an online community of practice and the details of the differences are unfolded within the findings that follow.

As a result of this study, three major findings were revealed. First, teachers' beliefs and high expectations about the role of community impacted many of them to design their courses to make community interactions possible within their online classrooms. The degree of effort that they were able to put into forming communities, especially building trust within the classes, allowed the full formation of learning communities to support content area instruction. Second, teachers who held synchronous classes, made possible with web conferencing software, reported the most successfully functioning learning communities. These classes allowed the students to form fully functioning online learning communities which included sharing collective knowledge with the classes. Third, the learning environments themselves were a major factor in creating fully formed learning communities. The learning environments, which permeated a positive school culture that encouraged community formation and which allowed teachers the pedagogical freedom to integrate technical tools to easily provide interactivity with their students, produced the most fully-formed learning communities.

Web School 2 outperformed Web School 1 when it demonstrated higher overall feelings of community in the online classes. This study used a modified Rovai community scale (Rovai, 2002b) as a measurement tool to document community and learning qualities found in each of the case study schools. This scale was created to look at positive factors about community building and learning ideals indicated in the statements made by the instructors and demonstrated through their artifacts of teaching. Web School 1 obtained an overall rating 22 out of 40 possible points measuring community and learning or 55% of the total attributes that were measured. Web School 2 produced a score of 28 out of 40 or 70%. The variations between these two scores

between these two schools are consistent with the variations seen in the other research findings presented within these cases and elucidated in the findings hereafter. Overall, Web School 2 demonstrated that through the teacher's beliefs, practices and institutional support that there were high feelings of community and learning ideals reported in each class.

Web School 2 demonstrated greater community and learning ratings and may be indicative of the feelings actually felt among students. These high community ratings, Rovai (2002a) contends, can reduce student turnover. The data revealed that institutional factors, as well as instructor beliefs, had an impact on the community and learning features present in each course. Web School 2, who scored higher on the community rating scale, had smaller, advanced level courses. The school used regular synchronous technologies and the student body is homogeneous in ability levels. The instructors also have advanced degrees.

Web School 1, who scored lower in the classroom rating scale had larger class sizes, used less multimodal, synchronous teaching technologies and had a potentially wide variability of the ability levels among the students. Web School 1 instructors consistently reported significant turnover among students, and this may be an indication of the lower community and learning ratings seen here and may actually be felt by the students in the school. Student turnover was reported to be as high as 25% in each course.

This research uncovered that there was also major environmental differences in the use of and availability of school-wide technologies that could promote deeper feelings of community among students. Many decisions about technology use and its availability were found to be at the institutional leadership level and outside of the control of the teacher, even though the technology use impacted teaching practice and student perceptions about the course. For example, Web School 1, the site of the first case study, defined itself as co-synchronous learning,

which meant that a cohort learned within the same course time frame as opposed to learning at the same time, together. Synchronous learning was used consistently in Web School 2. Synchronous learning at Web School 2 meant students were learning at the same time, together during the same classes. Web School 2 used web conferencing software, found to be effective in reducing transactional distance (Moore, 1993), for class meetings. Web conferencing was a school-wide expectation and consistently used in Web School 2. This distinction makes a difference because synchronous courses, which were made possible in-part by web conferencing software, reduced transactional distance (Moore, 1993) and increased feelings of community due to appropriate dialogue and structure within the courses (Rovai, 2002a). Feelings of community are especially important because Rovai (2002a) found that they reduce the sense of student isolation which can lead to students dropping out of a course. Web School 2, with their frequent and effective use of interactive technology, showed higher community formation because it reduced transactional distance (Moore, 1993) between students and teachers. The teachers in Web School 2 showcased classrooms operating at the highest level on the community of practice taxonomy, the transformation stage (Wenger et. al, 2002).

In contrast, Web School 1, the location where the first study was conducted, showed little interactive, synchronous learning opportunities. The findings also showed that Web School 1 communities of practice operated at a lower level on the taxonomy of communities of practice scale (Lave & Wenger, 1991). In this school, on average, these communities hovered around the second coalescing stage (Wenger et al., 2002). This case study demonstrated that there were other issues beyond synchronous learning which prevented closeness within their learning communities: lack of full participation among its members and feelings of lack of trust with the communities.

While Web School 1 and 2 instructors both reported their immediacy in responding to student requests, instantaneous responses achieved in synchronous classrooms, which are on par with face-to-face live interactions, were found in only Web School 2. Additionally, Web School 2 instructors, by virtue of using web conferencing software, used video in their interactions. They essentially provided face-to-face classroom interactions through video transmission. Web School 2's generous use of two-way interactive communication media helped to reduce the potential of students feeling distance in their distance learning courses. For example, one Web 2 instructor said how she purposefully used video conferencing and its contained text chat to remove feelings of instructor and student distance within her class.

….if a student is writing line after line in text chat, I actually say, 'You're raising some interesting points in text chat; let me call you to the *mic* so you can elaborate on them.' I kind of use that as a gauge of how-because I want them to come onto the *mic*; I want to see them, I want to hear them speak, and I want the other students in the class to do the same. The other thing that's kind of nice about the text chat is that it has a private feature, so that allows me to do something that I couldn't really do in the physical classroom, which is to very discreetly call on students who are being silent and who are not actively participating in discussion.

This idea of reducing distance within distance education courses is consistent with Moore's (1993) Transactional Distance Theory.

Moore's (1993) transactional distance theory presents an idea about the interaction between student and professors is related to dialogue and structure. His theory connects the idea that instructors can reduce the distance between their students by providing students with the

right amount of dialogue and structure related to their specific needs as a learner. Moore contends, "…highly interactive electronic teleconference media especially personal computers and audio conference media permit a more intensive, more personal, more individual, more dynamic dialogue than can be achieved in using a recorded media" (p. 25). There are other factors which can also contribute to the dialogue between student and instructor including class size, emotional distance between students and teachers, and the learning environment itself. Moore also contends that sufficient structure in designing courses can reduce feeling of distance in distance education. Greater responsibility is placed on the learner to use self-autonomy for learning with less structure and less dialogue within a course. Conversely, the more dialogue and structure that the course provides, less autonomy is required of the learner. Web School 2 reinforced Moore's theory in reducing transactional distance by the structure it placed in its courses. As an institution, Web School 2 provided support for web conferencing software use. In turn, the instructors provided significant dialogue and significant structure to support their learners through the use of weekly web conferencing software embedded in their courses.

Research Questions

The details of the findings of study are answered within the context of the research questions which follow. Each research question is preceded by a thematic heading which summarizes the essence of the research questions. The research findings presented here also present the challenges in developing these learning communities. Within each of the research questions, the findings are organized into sub-headings related to community, domain and practice which are consistent with the community of practice model (Lave & Wenger, 1991). Additionally, sub-themes which further exemplify community building features are highlighted within these areas.

Instructor Beliefs and Challenges of Online Communities

What are instructor beliefs about the role that community plays in online learning and what are the challenges to forming those communities?

To answer this first question, instructor community definitions derived from their interviews played a large role. Instructors from Web School 1 and Web School 2 shared community definitions which intertwined both their beliefs about community together with their conceptions about their teaching practices as shown in Table 1. Other instructors included domain in their definitions. Since the teachers' beliefs about community are so enmeshed with their views of their content area domain and their practice, the findings for Research Question 1 are organized into the major section: Community and Domain. The findings are further organized into the themes that were found in this study which are consistent with Rovai's (2002a) concept of classroom community including Trust, a Spirit of Connectedness, Interdependence and Participation.

Community and Domain

Two of the three teachers who were teaching full-year classes also defined community in terms of their domain, which is the content area of their teaching. The connections that the case study teachers made between their learning communities, their domains of knowledge and their practice provide added evidence that communities of practice (Lave and Wenger, 1991) were the structures that supported their online classrooms. Domain, in addition to community and practice, is one of the three components of a community of practice (Lave and Wenger, 1991). Since all of the teachers interviewed verbally connected the idea of community with practice, and two teachers tied community to specific domains; there appears to be a relationship between teachers' beliefs in connecting community with practice and community with domains. This is an

important distinction because Ertmer (2005) found that teacher beliefs impact their instructional

practice. According to Ertmer (2005), when teachers embrace an important connection, in this

case, the role of community for their class, it will drive what they do with their practice to make

those things happen in their classes.

The following quote illustrates an example of an instructor connecting community,

practice and domain:

> I think community in the online classroom environment involves students
>
> feeling connected to one another in regards to academics, but also in regards
>
> to non-academic social situations. I think it's important that students know
>
> one another, that they're comfortable with one another, and that students are
>
> forming study groups much like they would in a traditional setting. I think
>
> that having students present problems or solutions or papers or other types
>
> of things to one another is an important feature of community within the course,
>
> and I think that is one way in which community plays a role in my particular
>
> courses. There are a number of presentations during each class session. I think
>
> it comes down to students being comfortable with one another, students
>
> knowing each other both in terms of academics and in more social situations,
>
> but also just students being connected to one another.

One teacher shared her core beliefs about community connected to domain when she

stated:

> I encourage them to collaborate outside of the class. I have students engaged,
>
> when appropriate, in peer review of each other's work. For instance, if we're
>
> writing, particularly something like a final essay or a research paper students

are working on, I have them exchange papers and et cetera. I always try to pair up students that I know are not necessarily already friends as a way to broaden their circles. But again this is something that I would do in a physical classroom as well.

In each of the aforementioned statements, the instructors made connections that elucidate Lave and Wenger's (1991) conception of communities of practice. The sense of community is established as something that the group is formed to do around a domain of practice. The formation of the group is the first stage or potential stage in the communities of practice model (Wenger et al., 2002).

These peer-to-peer exchanges referenced by the instructors illustrate that the members of the learning community have progressed from novices that formed around the periphery of membership, to become fully contributing practitioners. This is an illustration of the concept of Legitimate Peripheral Participation in action (Lave & Wenger, 1991). Knowledge sharing is a core benefit of the community of practice model and usually means that the group has progressed into the second stage or coalescing stage of the community of practice model (Wenger et al., 2002). It is at this point where members of a group establish trust before they can move on to the other, higher levels of community formation.

Trust. Comments from nearly half of the teachers in Web School 1 indicated that lack of trust had been a problem in their online classes. This lack of trust was caused by reports of students misrepresenting their work, students' lack of academic integrity, students' lack of academic credibility and students not fully participating in their classes.

There were a number of issues of concern over misrepresentation of work and lack of academic integrity in Web School 1. One Web School 1 instructor related her concerns about

student academic dishonesty when asked about challenges in forming online communities. The instructor stated, "This student copied and pasted several assignments from the answer keys and posted them to the drop box as his own work. Unfortunately, he picked a few assignments in which there were distinct patterns to the formatting, which he would not have replicated on his own." The same instructor also added when speaking about a student, "He slipped and told me that his mom helped him on the quiz when he was complaining about a question being unfair." Another Web School 1 instructor relayed one student's concern that her work was plagiarized in another course on a wiki web site. The instructor recounted what the student said, "I know I posted this work but this person's name is now on it," and added, "So we alerted the teacher to go into the (web) history and you could see that it was actually the student's work." Students' concerns that their work may have been copied or represented by someone else could have been an issue that undermined trust in these online classes. Unlike face-to-face class where the first person who verbally brings up an idea is credited with the uniqueness of an idea, online students must rely on the hierarchy of the posts or date stamping devices in the web software to get proper credit for their own work. Academic integrity issues could have taken away students' ability to trust the credibility of their classmates because students need to count on the word of their classmates (Rovai, 2002a).Since the instructors themselves were members of their class learning community, their beliefs and concerns about academic misconduct were an indication that in some classes, the climate of mistrust impeded community formation.

This lack of trust experienced in Web School 1, according to Rovai (2002a), is what prevents a community from fully forming. The Web School 1 online classes did not move beyond the coalescing stage (Wenger et al., 2002) of community formation because they were limited by lack of trust within the classroom. If teachers in Web School 1 used interactive,

synchronous technologies such as web conferencing software to make students feel closer to their teachers and fellow students, greater feelings of trust may have been created within these online classrooms. These classes may have progressed into the transformation stage (Wenger et al., 2002) like Web School 2.

Rovai (2002a) identified that trust is an essential element of community formation. He also identified that several other factors were necessary to produce a classroom community including a Spirit of Connectedness, Interdependence and Participation.

Trust, according to Rovai (2002a) includes a feeling that members of the community can count on the "credibility and benevolence" of the members.

The first component, credibility, is an expectation that the word of other

learners in the community can be relied on. The second component,

benevolence, is the extent to which learners are genuinely interested in the

welfare of other members of the community and are motivated to assist

others in their learning. (Rovai, 2002a, p. 1)

Consistent with the importance Rovai places on trust in forming a learning community, instructors from both schools reported their feelings about instilling trust in their online classrooms. This statement from a Web School 2 instructor illustrates an example of the importance of credibility, found to be an element of trust, "Once they understand the idea that their peers are advanced, then they really like to learn from one another… I think they're definitely committed to learning new things together." This statement suggests that students need to feel that there is a credibility factor that must be satisfied before they are going to trust a fellow student. In this case, the credibility may stem from knowing that the students are advanced level students which warrant them to be trusted by fellow students. It is questionable

whether Web School 1's limited admittance requirements as compared to the rigorous admittance requirements of Web School 2 were an issue that impacted student trust factors of credibility. Students in Web School 2 were pre-qualified for admission on the basis of attainment of acceptable scores on norm-referenced tests such as SAT scores. Instructors in Web School 2 had a sense of the homogenous capabilities of the students within their classes because of the selection process. Web School 1 admission requirements varied by host schools. The Web School 1 students themselves may have felt the academic variation in the classes which may have impacted their ability to feel trust with their classmates. Rovai (2002a) found additional elements of trust to be important for communities.

Rovai (2002a) also included the concept of benevolence as a factor that impacts trust. This statement from a Web School 1 instructor illustrates the idea of benevolence as a component for establishing trust within their classroom:

> … they will honestly discuss with one another what is going on the in the
> classroom, and that they feel that it's a safe environment for them to interact
> and talk with one another..I think that the idea of trust has to built early on in
> the class so that when we have team classrooms and Wikis, they know that
> they can work well with one another and if they ask another person to do this
> part of the project, they know that that person is going to come back to it and
> fulfill that and do that.

This comment by a Web School 1 teacher suggests that trust is built early on in the class when students know that they can count on one another to complete project related work. This comment indicates that the teacher is aware that the teacher as well as the student plays a role in fostering trust within the classroom.

Teachers from both schools indicated that students could trust one another because they could share their ideas with each other, speak openly and rely upon each other. These comments demonstrate that trust is built into the course over time. Unfortunately, there were other examples where trust was not fully formed in the learning communities because learning gaps were not filled by the members.

In Web School 1 there were several statements that students were working independently rather than interdependently, and they had no expectation to rely on class members to fill their learning gaps. For example, one Web School 1 instructor said, "For the most part, students are extremely committed to learning this material, but they tend to work on it alone." The same instructor said about their students work with others, "They're pretty much on their own."

Community members need to identify and close learning gaps to fulfill feelings of trust within a community (Rovai, 2002a) so that learning can move into the maturity stage (Wenger et al., 2002). Learning communities may experience learning gaps when there is a lack of knowledge within the community. All community members need to feel that they can trust that they can share their knowledge shortcomings (gaps). They also need to trust that someone in the community has the tacit knowledge to help members out if they are in need of academic support (fill the gap). For example, if the community plans to *Skype*, other community members must be capable of trusting that more knowledgeable community members will teach them how to *Skype* if they do not know how to perform this technical function. If someone in the group doesn't have the skills, the community may seek outside knowledgeable others to fill the knowledge gap (Wenger et al., 2002).

> With trust comes the likelihood of candor – that members will feel safe and
> subsequently expose gaps in their learning and feel that other members of the

community will respond in supportive ways. Without trust, the classroom is

filled mostly by the instructor's presence. (Rovai, 2002a, p.1)

This research study found that it was the instructors, as Rovai postulates, who took up the job of filling learning gaps that existed in the classes (Rovai, 2002a).One instructor said, "If a student hasn't done well, then I'll meet with them individually to go over their assignments." Another instructor said, "Some students need extra reassurance, so I connect with them almost daily throughout the semester, while others work quite independently".

This was not necessarily a bad thing for instructors to fill gaps in the classroom learning communities, as Rovai's theory about community would indicate (Rovai, 2002a). The instructors who filled learning gaps were doing what instructors are expected to do, teach students. Students were doing what they were expected to do, let their instructor know when they did not understand something. This is consistent with Vygotsky's zone of proximal development theory (1978) which posits that more knowledgeable others should assist less knowledgeable students. Secondly, instructors who filled learning gaps for students in the learning community were acting as members themselves in the learning community. Students in these courses could trust that their instructors, as members of the learning community, would find and fill their academic learning gaps. Members within the learning community were assured that the instructors would fill the learning gaps of their peers so that they did not need to fill those gaps for their classmates.

Unfortunately, instructors in neither school shared any information that could be construed that students anticipated learning gaps of their classmates and filled them. There was evidence that students provided answers to each other's questions and minimized gaps. One Web School 1 instructor said about the online student discussions in her online class, "… There was a

lot of give and take there, a lot of: 'How do you do this?'" She added that she told the students, "You can get answers from me or you can get answers from other students." One Web School 2 instructor described how classmates talked about solving problems together when she mimicked student discussions, "Hey, did you solve number five? Can we talk about that?'

There were some more serious issues that threatened the sense of trust within the online community courses. Principally, these issues were raised by members of Web School 1. These concerns over trust, as described by the instructors, appeared related to the communication space created as a result of the transactional distance experienced in the course (Moore, 1993). Swift trust techniques initiated by the instructor such as "…social communications (and explicit statements of commitment, excitement and optimism)…" (Hiltz & Turoff, 2002, p. 58) may have lessened feelings of transactional distance, but the instructors themselves expressed their beliefs about the inferiority of the online digital tools for communication. Effective communication has been determined to be essential for establishing trust in online social networks (Hiltz & Turoff, 2002).

Two out of five of the instructors said that they felt that an online presence did not provide the same level of communication that could be provided in face-to-face instruction. This speaks to the issue of credibility because it means that community members could not rely upon trusting others in online interactions in the same way they can with face-to-face interactions.

One of the examples of the difficulty of establishing credibility, and thereby trust, was stated by a Web School 1 instructor, "The biggest obstacle is the fact that we don't see each other face-to-face...Not seeing and hearing each other with the immediacy of face-to-face encounters seems to keep them at arm's length." The instructor later added:

Yes, most students text each other moment-by-moment, but the people to

whom they usually text are established friends and family. They have

already formed relationships with those individuals, and I believe it is based

on a kind of trust they form through their face-to-face encounters.

Another instructor echoed that credibility was difficult to establish online with the

comment, "…the limitations of every communication being via discussion posts of some kind

don't always build the more casual interactions that we can build when working face to face."

Both of these comments indicate that the teachers themselves question the ability to establish

trust and credibility within their courses due to the nature of online interactions as compared to

face-to-face interactions. As stated earlier, trust is a prerequisite for community formation

(Rovai, 2002a). The instructors who shared their beliefs that online learning was less than or not

equal to face-to-face communication were from Web School l. This school overall had exhibited

low community feelings present in their classrooms.

Web School 1 was also the school where there were no interactive two-way, synchronous

communications among students and teachers. It is questionable whether these instructors would

have experienced increased feelings of trust, caused by better communication, if they were able

to use web conferencing software in their courses. Web conferencing software would have

enabled face-to-face instruction, even though the instruction was not in-person. Moore (1993)

found that video conferencing technologies were effective in removing feelings of distance in

distance learning environments. Web School 2 instructors reported using web conferencing tools

in the study. The Web School 2 instructors had not reported any communication concerns which

eroded at feelings of trust. In fact, an instructor in Web School 2 shared that her online students

were even more communicative with one another than her face-to-face students.

Overall, the most serious threat to the community feelings of trust were comments made earlier from the Web School 1 who relayed the experience that her student copied and pasted work and presented it as his own work. The issue of plagiarism undermines a group's ability to mature as a community of practice because it lessens feelings of members' ability to trust the credibility of other community members.

Though the gravity of plagiarism as an impediment to community formation seemed to weigh heavily in the balance, there were other examples identified from the instructors that positive signs of community presence and development were in-place, including a spirit of connectedness. The majority of comments of spirit of connectedness were shared by Web School 2, the school who utilized web conferencing technology twice weekly in their synchronous classes. This comment, which encompasses the spirit of connectedness found at Web School 2, was shared by one instructor when she described her online program:

'Onlineness' is not the most remarkable thing about us – it's the students

who we bring together, it's the academic program in which they engage

with each other and with our teachers; that's what's interesting about us.

The fact that this is now accessible to students in twenty-seven countries,

on five continents, and in forty-two states, and the fact that we bring them

all together, that's pretty remarkable too. I really think that having them

come together, not just for the single class, but having them come together

in a broader school community, a community that is at its heart academic

and involves a classroom, but also a community that goes far beyond the

classroom in various student clubs and activities and competitions and

publications that they collaborate on with each other and with their

instructors really then further reinforces the community that they have

in the classroom.

Spirit of Connectedness. Spirit of connectedness has been identified by Rovai (2002a) as an important component of community. Rovai states, "The first dimension, spirit, denotes recognition of membership in a community and the feelings of friendship, cohesion, and bonding that develop among learners as they enjoy one another and look forward to time spent together… Learners need to feel a sense of connectedness…" (p. 1).

Instructors from both Web School 1 and 2 made frequent reference to feelings of a spirit of connectedness within their classrooms. One instructor spoke about how students showed their spirit by connecting with several content areas, "The Core Division I **…** is really based on the spirit of interdisciplinary spirit, taking various ideas from different disciplines." For the most part, the spirit of connectedness was interpreted by the instructors as the propensity for students to connect with each other outside of class. One instructor stated that they knew students were connected outside of school and encouraged it, "I can tell immediately which students are close and connected enough that they're probably talking actively outside of class, and like I said, I try to pair up students who might not know other students in the class as well." The benefit of students connecting online outside of class for scholastic interactions (National School Board Association, 2007) is highlighted by the comments made by one instructor, "…typically we rarely have enough time to cover what we want to cover in a class period anyway, but having them do that outside of the formal class meeting time helps establish those connections and then build that community that is very evident than in a classroom." This relationship between students meeting outside of class to assist one another in their learning was perceived by instructors as being both beneficial and indicative of being part of a learning community. Also

this spirit of connectedness which Rovai (2002a) identified as a factor of learning community

formation includes students learning from each other and sharing knowledge. These are also key

components of a community of practice (Wenger, et.al, 2002). One instructor stated specifically

that she had identified students co-created knowledge, "…they'll say some connection which

shows that they learned something new from the other student, but it's not necessarily into that

formal document … It's more of an informal kind of thing." Gunawardena et al. (2009) found

that co-creation of knowledge could occur informally or formally to produce a truly functioning

community of practice. Another instructor went so far as to state her belief that the spirit of

connectedness in her online courses surpassed the face-to-face classes, "I really do think that our

students are more connected to each other than my students in the regular university world." The

instructors who made positive statements about their students, who interacted both inside and

outside of class, demonstrated that pedagogically they welcomed these online student-to-student

relationships. These supportive instructor attitudes, regarding students connecting inside and

outside of school, are what gave rise to classroom practices that fostered online communities of

practice in Web School 2.

The feeling that students have a connectedness to their community is essential to the

success of the community. In online classes, this element is essential because it adds to

motivation to stay involved in the community. Without feelings of connectedness, students may

not succeed in the class or drop out of the class altogether (Rovai, 2002a). "Non-involvement in

the classroom community, according to Gibbs, can possibly lead to feelings of loneliness, low

self-esteem, isolation, and low motivation to learn, which in turn can lead to low achievement

and dropouts" (Rovai. 2002a, p.1). A feeling of interdependence is another theme which

emerged from the study.

Interdependence. Interdependence is another area of community that Rovai (2002a) identified as important to community formation. According to his community model, interdependence takes form as interaction. Interaction is Rovai's third dimension of community formation (Rovai, 2002a).Interdependent interactions are factors that Web School 1 and 2 instructors show to be valuable for community formation in their classes. Specifically, Rovai theorizes that these interactions can be either task-driven or social-emotional driven. It is the social-emotional driven interactions where students exchange information about their selves and increase feelings of trust that contribute most to student persistence in college (Rovai, 2002a) and keep students registered in their courses. Social-emotional interactions are identified when students relate personal information about themselves and bond with their classmates, "Thus increased disclosure of personal information can strengthen classroom community" (Rovai, 2002a, p.1). The concept of interdependence and community disclosure is closely linked to feeling of trust within the community. Trust was discussed earlier in this section and is discussed hereafter within the context of interdependence.

In this study, there were several examples of community disclosure. When asked about students being able to speak openly, one Web School 1 instructor made the following comment, "They do share with each other- Sometimes I'm surprised because some kids say, 'I have an eating disorder' or 'My sister has schizophrenia,' so they are actually very open about what they share." Another Web School 1teacher reinforced these same sentiments about students feeling appreciative that they can speak freely with one another, "…nobody's going to hold it against you, and nobody is going to question you about it in the hallway. And it's not going to be something where somebody says, 'Oh, I can't believe what she said.'" These examples demonstrate that students are operating as a community within their domain areas of instruction.

While students in Web School 1, according to their teachers, were able to express themselves freely, there were other trust related issues that prevented these students from exhibiting the degree of trust Web School 2 students showed in their classes. Lack of academic integrity and doubts about academic ability interfered with establishing credibility in the Web School 1 courses. Additionally, limited class participation threatened feelings of benevolence in Web School 1student interactions.

Another example of lack of academic credibility was demonstrated when one instructor said, "Some groups really do work well together, and others just don't because not all students are as conscientious as others." This statement illustrates that the instructor may have seen feelings of trust degraded because students could not count on the abilities of less conscientious students in some groups.

One other example of diminished academic credibility was shared by a Web School 1 instructor who related a situation where varied academic standards the school caused difficulty in her class. The instructor stated about one student, "He may not have been as big of a hindrance if the school he was from had not bent their AP rule about having to pass the class to take the exam. Thus, knowing that he could take the test anyway, he rarely did any work. The work he posted was of poor quality." This example again demonstrates that students may not have been able to trust the ability of their classmates because of the differing academic standards within the school. Lack of trust in the ability of students, may have challenged credibility and thereby, trust.

An example of lack of benevolence, shown due to limited class participation, was shared by one of the Web School 1 instructors, "Perhaps 10% of the time they will notice areas of difficulty and point it out to their peers in order to help them and get to help them too." What this is also saying is that 90% of the time students do not have the benefit of peer participation to

help them through difficult situations. In situations such as these, students may have felt that they were on their own the majority of times and felt little confidence that their peers would be there to help them out. Students need to feel confident that their classmates care about their well being to feel that benevolence exists in their classes and to feel trust among fellow students (Rovai, 2002a). In addition to trust, students need to feel that they can connect with members of their classroom learning communities. This connection occurs through interdependent interactions.

The concept of interdependent interactions within a community is consistent with the coalescing stage of communities of practice (Wenger et al., 2002). This is where the groups have developed both trust and technical means for knowledge sharing. It is from this point where the community can grow into the maturity stage in which the community is fully formed (Wenger et al., 2002). The maturity stage is the true purpose for the community formation. In terms of a classroom community, it is the participation in learning activities which is the purpose.

Active participation. Active participation in the community for learning is a prevalent theme that emerged among the instructors as important for community formation. Active participation in a community is part of the maturity stage in Lave and Wenger's (1991) concept of community. It is at this time that members seek to fill the gaps in knowledge among members and look for resources to fill those gaps (Wenger et al., 2002). This is the activity of the community that relates to learning. Learning is "an integral and inseparable aspect of social practice" within the classroom community (Lave and Wenger, 1991, p. 31).

The instructors in Web School 1 and Web School 2 heavily identified with participation as being vital to learning within their classroom. Active participation in the courses, which instructors have identified as critical, is a fundamental element in a learning community. Rovai stated, "In sum, learning represents the common purpose of the community as members of the

community grow to value learning and feel that their educational needs are being satisfied through active participation in the community," (Rovai, 2002a, p. 1). Participation by students within the classroom is the point where learning occurs in school, according to Rovai (2002a). His conceptions about learning are consistent with Lave and Wenger (1991) who purported that learning is a sharing of purposeful activities. The concept of participation is important because the practice of learning, and learning within a community have equal importance (Rovai, 2002a). The idea of learning by participation adds another level to learning because it relates to improving scholastic practice by working with others and learning from others. Practice, one of the three elements of a community of practice, is discussed again in Research Question 2.

One of the Web 2 School instructors claimed that students in her class were learning by their active participation with another. Consistent with Liu et al. (2009), she credited the use of social feature tools as a key to improved practice, "…In general I think the students that are most actively engaged in the social features are the ones that are performing best in the course. I think part of that is just because they're able to more actively form study groups with other students; when they're already talking to them socially, it's easy to say, 'Hey, did you solve number five? Can we talk about that?' I definitely think that being engaged socially contributes to success."

Another example of how students were working on their scholastic practice in student directed meetings was shared by yet another Web School 2 instructor, "…Typically we rarely have enough time to cover what we want to cover in a class period anyway, but having them do that outside of the formal class meeting time helps establish those connections and then build that community that is very evident in a classroom." It is these strong examples of student directed learning focused on practice improvement, both voluntary and involuntary, that suggested that well developed learning communities existed into Web School 2.

In looking specifically at the major themes of community that this study illuminated: Trust, Spirit of Connectedness and Interdependence, Web School 1 demonstrated a weaker foundation in building a classroom community than the foundation that Web School 2 demonstrated. In regard to trust, Web School 1 presented evidence that students can speak openly and feel safe in their interactions with classmates. A few of the instructors indicated that they are looking to build community through team building activities in discussion posts. What weakened the feelings of a classroom community were instructors who, from this same school, reported that communication is a problem within their school. In this school there is almost total reliance on discussion boards alone. The lack of tools provided by the institution gave the instructors limited vision in what they can provide to their students to build a stronger learning community. Instructors reported that students resorted to using tools outside of the classroom community including *Facebook* to fulfill learning missions because the course does not provide these technical tools. While it is admirable that students took the initiative to form informal groups on their own, the students could have yielded greater results in forming learning communities that all class members could have participated in if the school supported use of collaborative digital distance learning tools. Also, if these teachers modeled effective use of tools which could support group learning such as web conferencing tools or *Skype*, students could have built stronger scholastic networks.

Another challenge to the development of fully formed online learning communities at Web School 1 was the fact that instructors reported that they themselves find face-to-face interactions stronger than online interactions. Their beliefs (Ertmer, 2005) about the strength of face-to-face over online interaction could have impacted their practices. These beliefs about the superiority of face-to-face instruction may have caused them to have low expectations about the

strong collaboration that can occur in exclusively online courses. For Web School 1 of most concern, is the report of plagiarism which puts the question of trust at risk between students and instructors.

In regard to spirit of connectedness, another major theme of the study, there is not an overwhelming feeling that this condition is fully met in the school. While Web School 1 showed instructor examples that the students are connected to one another, it is mostly through their participation of group work. There is also equal evidence that the students are isolated, "They're pretty much on their own, and for some of them it's their first time on their own actually needing to do things like an adult," and, "For the most part, students are extremely committed to learning this material, but they tend to work on it alone."

Feelings of interdependence, another major theme of the study, and closely related to spirit of connectedness, are questionable in Web School 1. There were several reports of non-participation which would undermine confidence and reliance on others within the community. One instructor said, "In order to function well, the participants must be dedicated to the community. Students who do not post their work in a timely fashion, or do not uphold their responsibilities in group projects hurt the community.

Additionally, one instructor reported that one of their students reported having her feelings hurt because of how her classmates communicated their disappointment in her because of her lack of group work participation. The instructor said, "Because she wasn't very self-motivated, her teammates were letting her know, pretty clearly, 'you're letting us down.' She didn't like that." The same instructor said within the context of this discussion, "I don't think it's going to be a really close-knit community that gets formed." These examples illustrate that in Web School 1 that it is a norm that participation in these class communities are inconsistent. The

examples also display that the instructors realize that interdependence and dependability of students to participate with one another in group work are important to the class' success in forming a close-knit learning community.

Web School 2 presents an entirely different story about community and its challenges. This school has reported no challenges to community formation. Two out of three of the instructors reported that online and face-to-face community building is similar, and one instructor believes that online may even produce a stronger community. In regard to trust, Web School 2 has not reported any incidences of plagiarism. Instructors have reported that students are committed to learning together. In regard to the spirit of connectedness, instructors have reported that they are looking to create an interdisciplinary spirit and they encourage collaboration among the students. Connections are encouraged beyond the classroom to complete work together. Students are reported to support each other and confident others will fulfill their responsibilities in projects. Interdependence is evidenced by the quality of the work reported. Students are encouraged to ask questions and to provide peer review, which has shown to produce superior work.

Overall, community features are evidenced in both Web School 1 and Web School 2. Web School 1 seems to be stalled in the community of practice model at the coalescing phase because issues of trust prevented it to go beyond this stage and progress into the maturity stage. Web School 2 seemed to have classes which are fully functioning communities of practice. Since sufficient trust is in place for the classes to establish the maturity role of community of practice, the more advanced level classes appeared to reach the stewardship stage and transformation stages in which the communities are developed beyond the classroom and can continue into other courses that students take together. The continuance of community at the stewardship and

transformation level is documented by comments that the students are "Skyping" to extend their learning. The courses provide school web conferencing tools for them to communicate, but the students chose to use their own freely available student selected technical tools such as *Skype* or *Facebook*. These students are equipped with both the technical tools and psychological tools (Vygotsky, 1978) to extend their learning after the formal course ends. These students have been shown models of how to use web conferencing as a means to achieve further academic learning, and it appears that the students are replicating it with their *Skype* interactions. Students are using *Skype* for several uses, including setting up impromptu study groups and to complete course required projects.

Promoting a Feeling of Community

Which methodologies and technologies do instructors use to promote a feeling of community for their online students?

Instructor interviews and observation of instructional artifacts provided the data to answer this research question. Research Question 2 findings were divided into domain and practice, and the instructional methodologies used in these areas. Since these online academic learning communities were formed principally to teach specific content areas of instruction, the majority of responses gleaned from the interviews illustrated how methodologies were employed to form communities through the lens of domain content knowledge. The major technologies used to support the domains, course technology tools and interactive technologies, are discussed here. Secondly, teacher instructional practices and student scholastic practices, which illustrated community formation, are discussed in this section.

Methodologies and Domain

The concept of domain, one of the three prongs in Lave and Wenger's (1991) community of practice model (CoP), was the most prevalent theme that emerged to answer this research question. The CoP model is part of the conceptual framework of this study. It posits that communities of practice provide support structures for learning. Domains are the content areas of knowledge and the purpose for communities to form in the first place (Lave and Wenger, 1991). In the case studies presented here, the domains are high school academic credit courses. Two prevalent sub-themes surfaced from the data addressed the two part research question: the methodologies related to classroom structure (domain) and the technology supporting the domain.

Course technology tools. Web School 1 instructors used the Desire2Learn web platform as the course management tool which supported the content resources for each class. The school communicated its policies through a detailed web site and through instructor syllabi.

Audio announcements were used by instructors but it was reported that it was difficult to archive the announcements. Although a few of the instructors reported that they had access to *Elluminate* web conferencing software, they reported difficulty using it due to bandwidth issues and other concerns. At the time of the study, there were no reports of its use among the interviewed instructors. *Elluminate* software allows both synchronous and asynchronous transmission of audio, video and text based media for educational purposes. One instructor used *Wimba Voice* software regularly for voice recording but it too proved problematic. *Wimba* is a web-based collaboration tool which is currently offered together with *Elluminate* as part of *Blackboard Collaborate*, another web-based course management system (www.blackboard.com). While there was availability of web conferencing software and other

collaboration tools, Web School 1 instructors communicated no school expectations that these interactive tools were to be used for instruction. It may be because of the technical difficulties that instructors had reported in using these tools with students at a distance that these tools were not required to be used. This comment was made by one of the instructors in reference to use of web conferencing in her online class:

> I have had enough difficulty getting the students set up on *Wimba* that I haven't attempted trying to use *Elluminate Live* with them. I just had one student finally get the *Wimba* working; I don't know what the problem was because it doesn't take a lot…we spent two hours online with *Wimba* the first year we were using it, figuring out what the problem was. But of course from trying, online.

Wikis, blogs, discussion boards, and journals were used to debate, analyze, and complete group work among students. Discussion forums were used among students regularly. For socialization, a Student Lounge and a Water Cooler were available for students to communicate with one another. The Student Lounge and Water Cooler areas are informal areas of the course management program where students can post comments that are not part of the official course discussion forums. These locations were used primarily at the beginning of the semester for students to interact with one another. There was a Chat feature built into the course design but it was infrequently used since it was a synchronous feature that required being online at the same time. Private threads were used between students and the instructor to communicate to one another asynchronously. Private threads were used to help trouble shoot technical issues that did not involve the whole class, provide individual grade comments or discuss attendance. Students

were not permitted to e-mail their professors directly but through postings. If there was a school Site Coordinator, that person was the primary contact between students, teachers and parents.

Web School 1 frequently used Site Coordinators as primary contacts between Web School 1 and enrolled students from brick and mortar schools. For example, some traditional brick and mortar schools supplemented their curriculum offerings with courses offered by Web School 1 and students took one or more online courses on an a la carte basis. These coordinators also offer administrative and technical support at their home schools. Other students, such as the homeschooled, interfaced directly with Web School 1 and its instructors.

Web School 2 instructors used the eCollege course management software which allowed for independent and collegial learning. Power School software was used for grading. The course syllabi were the chief locations to find course policies. Additionally, the school provided a detailed website, family handbook, instructional guidelines, and a code of honor which were required to be signed for proctored exams. Web conferencing software was used to host synchronous online classes. The synchronous classes used microphones, video cameras, white boards, slide sharing and application sharing tools. Text chat was also available for students. The class format included professor lectures on video that students watched before live, twice weekly synchronous classes. Students communicated in discussion forums during the live classes. The online classroom allowed for web conferencing break-out sessions and interactive whiteboard sharing. Students used *Skype* with one another as follow ups for peer learning. These *Skype* sessions were initiated by the students to form study groups. Google documents were used for collaboration and peer-review of work. Web School 2 teachers used interactive and instantaneous technologies routinely to foster personal interaction among students.

Interactive and instantaneous technologies. Web School 1 and Web School 2 both used online course management systems. Each of these schools used discussion forums, peer collaboration and group work as part of the course. What separated Web School 2 is its use of more elaborate forms of technology which provided for more personal instructional strategies. For example, Web School 2 used video lectures preceding online classes. This allowed students to discuss theories learned in the lectures with classmates, allowing for a greater degree of interactive knowledge sharing and trust building. Web School 2 also used interactive white boards during their live classes to complete mathematical problem solving in real time. Students also accessed interactive chat features before class to build rapport with one another. Web School 2 also reported using reciprocal teaching as a methodology for peer learning. Teachers in this school assigned students extra discussion responsibilities that corresponded to weekly lectures. These students were assigned the role of lecture expert to assist other students. Students were then able to use online technologies to complete these assignments together. Reciprocal teaching methods reinforce Vygotsky's (1978) social constructivist theories. Reciprocal teaching methods have shown to be effective in improving student comprehension through collaborative learning practices (Palincsar, 1998; Viadero, 1996).

Web School 2 promoted their use of an online synchronous classroom as a feature that was a standard for course programming. The online classroom allowed for immediacy of interactions between students and their instructors. With other types of distant learning interactions, students need to wait until their instructors and peers respond to their requests for information and collaboration but web conferencing software used by Web School 2 provided instantaneous interactions. Additionally, Web School 2's use of live web conferencing classes allowed instructors to engage students in the class communications and solicit full participation

in the class. As stated earlier, participation by members in the learning community strengthens feelings of community. One Web School 2 instructor commented, "If I see that students are not contributing readily or frequently to discussion, I call on them; quite literally, I call them through the microphones."

The online programming, made available through web conferencing in Web School 2, enabled students to interact with their course instructors and fellow course participants concurrently. Swan (2002) found that the student's overall satisfaction with their courses is impacted by interaction with course content, course instructors and course participants. In this case the technical tools provided by the school and used by the instructors enabled students to be closely connected with their instructors and peers. Effective technical tools in themselves have also been found to help contribute to greater student satisfaction within the course (Cavanaugh et al., 2009). In the end, course design and pedagogy are the two features which matter most in producing learning effectiveness (Rovai, 2002a).

Methodologies and Practice

The following study findings, which pertain to methodologies, are described hereafter as they apply to the development of community through academic practices: teacher practices and student practices. Lave and Wenger's (1991) idea about practice includes the work that a group performs together for the purpose of enhancing their abilities within a domain area. Web School 1 and Web School 2 have widely varying degrees of evidence of effective practice in the classroom communities of practice structures. Effective practice, for the purpose of this study, means that the scholastic members are sharing their repertoire of resources including knowledge, experience and tools (Wenger, 2006).

Teacher practices. In Web School 1, different instructors presented different perspectives about practice. Although instructors within this case school used group projects and peer discussions, there was little evidence that deep changes to students' academic practice occurred in these online classrooms. In some cases, the instructors themselves presented negative viewpoints about community. One of the instructors presented students working on their classroom practices as though it was a chore rather than a joyful learning experience, "They're forced to work together and to comment on each other's work, and many find this to be tedious." The instructor added, "They get to know who is really on it and doing some deep thinking, and who is not really working their hardest in the class." This viewpoint makes it seem that attempting to work as a community is a painful process since according to the instructor, many of his students, he said, found working together to be so tedious. Since he also added that his students are forced to work together, this is contrary to a learning community concept which presents collaboration with others as a method to find solutions to work problems (Wenger, 2006). This portrayal by the instructor of students being forced to work together gives rise to Ertmer's (2005) work about teacher beliefs impacting practice. If the instructor believes that student group work is tedious, he may expect that the next group of students will find group work tedious too. In turn, the instructor who finds little academic benefit or social benefit to group work may in-turn limit use of group work in his curriculum.

Other instructors from Web School 1 provided entirely different viewpoints. One instructor attested that students do learn from her as an instructor and from each other by answering questions from one another. Another instructor stated that collective knowledge occurred in student practice, "…they'll say some connection which shows that they learned something new from the other student." This wide variation of viewpoints among instructors

about collaborate practices was an indicator that the overall school culture may not place high demands on classroom collaborative practices. In some of the classes, collaborative work was viewed as tedious, and others viewed it as a benefit to share knowledge with others. It appeared instructors in this school were left to their own accord to build their learning communities, or not. These instructors seemed to have the autonomy to design the courses the way that they wanted to and to implement methodologies at their own discretion. This instructor comment made the point clear that it is up to instructors alone to implement community forming techniques as soon as they want to do. One instructor stated, "You just put something in my mind. I think the students might appreciate seeing me *yack* at them. I could video tape myself… shoot myself telling them, 'This is what I want you to do.' They might like that." Another instructor from the same school was concerned that students would form discussion cliques, so she implemented class requirements to ensure communication equity. "There are constant reminders in the directions for the discussion posts to be sure and include everyone in the discussion. I even have requirements that they must post to different people, or that they must respond to the next post, in an attempt to keep students from pairing up and not interacting with the whole class," she said. These comments indicate that here is variability in teacher beliefs about effective practice in Web School 1. The data from this case study school puts into question if in some of the classes there is sufficient proof that practice is improved at all by students' coexistence and working together. One instructor from Web School 1 commented, when speaking about his students operating as a community, "This range of motivation/interest/maturity reveals itself and can cause a fledgling community to fracture before it can solidify." This comment suggests that this instructor believed that there were so many differences in the make-up of the students themselves that it prevented the community from fully

forming before it could function completely as a practicing community to share their repertoire of resources. This instructor's comments, which seem negative in his beliefs toward community, may be transferred into his practice though these beliefs may be an accurate assessment. As was stated earlier in the findings, students need to feel a sense of trust to form into a community (Rovai, 2002a). One of the components that shape trust is credibility. When students feel there are so many differences between themselves and others, this can prevent the community from fully solidifying and practicing effectively. It is possible that if this same Web School 1 instructor had strong feelings about the possibility of a classroom community formed to practice that he could attempt to build feelings of similarity within the course rather than differences. It seems from his very insightful comment this instructor believes that attempts to build a community are already thwarted by the obstacles caused by the differences in the students. This instructor conveys community efforts may be stalled, so there is no need for establishing high expectations for forming a learning community of practice.

This same instructor in Web School 1 added, "Another possible obstacle to forming an online community is the knowledge that these students are very unlikely to ever encounter each other again once the class ends." While this explanation seems plausible, according to Wenger (2006), the continuation of membership from one community into another is not necessarily a condition for a community to exist. Community membership that does progress to the level of transformation, where the community accomplishes their goals and moves into another is a fully developed community and is the highest stage of development. It seems as though this Web School 1 instructor has a good understanding of the attributes of community. Though, his beliefs seem to indicate that if his students do not have all of the attributes of what a fully formed

community should have, then it is unlikely that he will expect a community to form in his classroom to share resources and skills.

Student practices. Teachers described student practices in their courses. This one comment from a Web School 1 instructor summarized that the students were stalled in the coalescing phase (Wenger et al., 2006) because they could not trust that other class community members would assist them in their practice, "They're pretty much on their own, and for some of them it's their first time on their own actually needing to do things like an adult." This final comment defines the level of community development where Web School 1 courses end. If high expectations about community where permeated from the instructor and within the culture of the school, K-12 students would never be made to feel that they were left alone.

Web School 2 presented stronger data that student practice is a solid part of the community of practice structure. Like Web School 1, Web School 2 also had group projects and peer sharing, but the depth of participation appeared greater. For one thing, students in this case study school were able to engage with their practices in real-time within the online classroom. One instructor clearly identified the impact on practice through collegial learning in this statement:

> …in general I think the students that are most actively engaged in the social
> features are the ones that are performing best in the course. I think part of that
> is just because they're able to more actively form study groups with other
> students; when they're already talking to them socially, it's easy to say,
> "Hey, did you solve number five? Can we talk about that?" I definitely think
> that being engaged socially contributes to success.

Other instructors in Web School 2 reiterated that in live classroom interactions, students learned from one another, "But when you're having that conversation in a text chat that everybody can read, then that actually pulls in the other people in the classroom into that conversation."

Additionally, instructors in this case study had made several correlations between student engagement in their practice and their performance in the class. One Web School 2 instructor stated, "I see some correlation between how often students make use of the opportunity of group work and the grades that they get for projects like papers." He added, "Students are recommended to share their papers for a peer review of their papers…So participation grade and the final grade should have really strong correlation here." This instructor felt strongly about the relationship between group work and grades when he stated that he was qualified to make a correlation between these two factors, "I also teach statistics, so I may have a nice intuition about how the data looks."

In contrast, Web School 2 has concrete examples of how students are effectively engaged in their practices by sharing their resources, including their knowledge, with one another. For example, one Web School 2 stated when discussing the peer review requirement of the course, "...it seems like they may have the opportunity to work very intensively with helping each other." Another instructor commented about her peer review assignment, "I encourage them to collaborate outside of the class. I have students engaged, when appropriate, in peer review of each other's work." Since the peer review requirement was a component of the classes, it appears by building course requirements which required students to work together on their practice, that the instructional design efforts facilitated opportunities for community building. This is especially true when the instructors shared their beliefs that students should work outside

of class to learn from one another and the students completed these tasks on their own. This is indicative that the students in Web School 2 operated at the maturity stage of the community of practice model (Wenger, et al, 2006). Students from Web School 2, as discussed earlier, also used free online digital tools to communicate with their peers outside of class. These practices are indicative of the stewardship stage of communities of practice (Wenger, et. al, 2006). Finally, students in Web School 2 demonstrated that they advanced the community of practice model to the final transformational stage because these students are extending their practices beyond the classroom with their uses of additional technologies and time devoted to learning (Wenger et al, 2002). One Web School 2 instructor revealed that she witnessed students operating at the transformational stage, "Sometimes in the text chat, I see some of them bring up something related that they discussed in a different course, and they start debating that in the text chat and going back and forth about it." Since this school model includes students who may in turn take future courses together, it is quite conceivable that the communities of practice model will be continued into additional classes.

The idea of how communities were formed and sustained was looked at through the lens of practice, one of the features of Lave and Wenger's (1991) communities of practice model. In Web School 2 students communicated beyond the structure and technologies of the course. These classes developed into high level communities of practice, functioning at the most developed stages for the reasons described earlier. The Web School 2 instructors have said that their students assist one another through peer review. They communicate with one another about their studies beyond the classroom. Finally, Web School 2 instructors have said that their students bring the knowledge of skills from other classes to share with one another in their new online classes. All of the Web School 2 instructors' comments clarified that students learned

from each other in their online courses. The instructors cited peer reviews, student lecture responsibilities and student work outside of school that collective knowledge occurred within these classroom communities (Zhang et al., 2007; Gunawardena et al., 2009). These findings support the original conception for the study, according to Vygotsky (1978), students learn by more knowledgeable others and that a community of practice can produce greater collective knowledge (Gunawardena et al., 2009).

While the methodologies and technologies that instructors used in their course designs and instructional practices differed, it was evident that the instructors in this study tried to create feelings of community within their classes. Based upon the comments that the instructors made from this study and researched instructional practices known to be effective in creating feelings of community in classes (Rovai, 2002a), those instructors whose beliefs were strongest to support community in existence in their classes were those that reduced feelings of distance in their courses through increased dialog (Moore, 2003).

Software programs that allowed for frequent, interactive communication using a variety of modalities increased feelings of community by reducing feelings of distance. This was conveyed primarily by the instructors in Web School 2 through their comments that they themselves made about the strong communities that they have in their classrooms and the multimodal technical tools that they used to foster those communities. Additionally, Web School 2 overall scored the highest in the modified Rovai Classroom Community Rating Scale, which provided additional evidence that the activities, methods and tools used in Web School 2 provided high levels of community feelings and should be replicated.

Artifacts as Evidence of Community

Which artifacts of teaching provide evidence of the formation and continuation of digital distance education communities?

Since Question 3 was designed as a two part question, it sought to first provide evidence of the formation of community defined earlier as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis in Rovai, 2002a, p. 1). Second, it sought to provide evidence of the continuation of community. The findings of this research question are organized into two parts: artifacts and community formation plus artifacts and community continuation.

The conceptual framework which highlighted community formation strategies illustrated by the theories of Rovai (2002b, 2004), Lave and Wenger (1991), Bailey and Card (1999), was demonstrated by course methodologies such as course timeliness requirements, communication, honor codes and peer review. Instructor interviews provided the principle evidence of community formation rather than the artifact texts.

Artifacts and Community Formation

The artifacts in themselves could not answer this research question alone. The artifacts, or physical tools of the course, such as the course directions, policy texts, project lessons, rubrics, syllabi and websites provided little information about course community features. What the artifacts revealed was more information about the methodologies employed in the classes. The methodologies themselves such as the use of discussion posts, group work, peer review and reciprocal teaching provided evidence of community formation. This information was discussed in the findings of Question 2 which pertained to methodologies and technologies. The artifacts,

because they were in text form, documented that these methodologies and technologies existed. They supported the elements known to form community: connectedness, trust and interdependence (Rovai, 2002a).

It may be that the artifact documents did not reveal enough about the formation of community because these artifacts were not seen in use in an operating class observation. These artifacts were reviewed devoid of participating in a class and their value was in detailing how the instructors used these artifacts in the course of their teaching methods. For example, the benefit of the seeing the directions for a proctored exam and school honor code form did not have language that was indicative of a learning community's existence. The interviews which preceded the artifact review and which detailed the existence of a school honor code gave meaning that the honor code artifact was a methodology that maintained trust in the class environment. In summation, it was found that the artifacts or tools that the instructors used were important to review but they did not reveal in themselves whether or not participants could feel that they were part of a community. The importance of the artifacts and their meaning was within the context of how the instructors said that they used these artifact tools for instruction to foster learning community development.

Artifacts and Community Continuance

The evidence for the continuance of communities also was not supported by the artifacts. Rather the instructor interviews provided this information and it was discussed earlier in the Findings section within the context of Question 2. The continuance of communities was shown through the interviews to be examples where students themselves were using *Facebook* and *Skype* to continue their communication outside of the course. This was illustrative of the fifth stage of development found in the communities of practice model (Lave and Wenger, 1991) or

transformation stage (Wenger et al., 2006). Those students, mostly those who used *Facebook* and *Skype*, had developed the self-directed communication and collaboration tools to transform their online class community into new learning communities. The students in Web School 2 were equipped to enter into new communities because the instructors had revealed that they were already doing this when they were sharing their knowledge from class.

The implications for practice found from this study will be discussed in Chapter 5. It includes design considerations for successful online K-12 practices based upon what instructors' beliefs are for what works in online classroom instruction.

Chapter 5: DISCUSSION and IMPLICATIONS for PRACTICE

This study was designed to determine the role that community plays in connecting students in K-12 online scholastic networks. The study looked at teachers' beliefs and their methodologies as determinants of the importance of community's role in their teaching practice. The study also looked to establish if the methodologies instructors used to support and maintain online learning communities included a community of practice model, as defined by Lave and Wenger (1991). The premise for this study was that if teachers' beliefs show value for community building, they would provide an academic structure that supports a learning community of practice. Teachers who believed in the benefit of a class community would situate learning around a content domain. They would create features which invited community formation through the use of targeted instructional strategies and methodologies. This concept is depicted in the Digital Distance Learning Community Framework shown in Figure 2. Digital distance learning communities is the name given to the online learning structures formed in these case study schools.

This framework illustrates the theoretical concepts which underpinned this study. It includes the social constructivist ideas of Vygotsky (1978), the community of practice model of Lave and Wenger (1991), the importance of community found by Rovai (2002a), the transactional distance model of Moore (1993) and applies it to modern Web 2.0 tools for online learning. This framework is similar to the work of Gunawardena et al. (2009) in that it looks at Web 2.0 tools applied to Lave and Wenger's (1991) community of practice model, Vygotsky's zone of proximal development and social construction of knowledge. What differs is that Gunawardena et al.'s work focused on the six phases that a learning community progresses through in its development, from context to socially mediated metacognition. In the end,

Gunawardena et al. found, "A key feature of this peer-to-peer learning was mutuality-the reciprocal process of exploring each other's reasoning and viewpoints in order to develop a shared understanding" (p.21). The theoretical framework presented by Gunawardena et al. related to informal social networks whereas the framework presented here in this study applied to scholastic social networks, which operated in high school online learning environments. Also, Gunawardena et al. looked at six phases of learning which developed the learner from the context stage and spiraled through additional phases until the community of practice developed a shared understanding of meaning. In the framework presented from this study, the traditional phases of community of practice development were used to see the degree of community formation which occurred in the case study schools and where individual learners shared their knowledge with each other acting as members of a learning community (Wenger, McDermott, & Snyder, 2002).

Discussion

This study sought out to be prescriptive and look at what has been known to be effective in higher education in online learning and apply what can be transferrable to K-12 online learning. For this reason, this study is discussed within the context of what is already known to be effective in online learning and make additional recommendations for practice.

The research determined that teacher beliefs about community were a factor in their design of online classrooms that integrated concepts important for community building: trust, interdependence, connectedness and participation (Rovai, 2002a). Teachers from the online school that put a high emphasis on online synchronous collegiality, where collaboration is encouraged, and where peer review is part of the instructional model, demonstrated strong beliefs about community building. They also demonstrated great feelings of community within

their classes as indicated by their instructional practices. Additionally, these same teachers showed strong, well-developed communities of practice which were discussed at length in the Findings section of this study. There is a research-based relationship between these classrooms that use synchronous tools and their ability to show more advanced learning and community features. Moore (1993) found that synchronous technologies can increase feelings of community (1991). Additionally, McBrien, Jones and Chen (2009), found when using video conferencing software in an online course, students rated the course positively in terms of social interaction and participation.

Teachers in this study who showed high regard for community also expressed "what is good for face to face instruction is also good for online instruction." This belief however is contrary to research that is known about online learning. Online classrooms need to be designed specifically for online environments. Since there are factors unique to classes with limited student interactions, Cavanaugh (2009) found that there are unique techniques that must be implemented in online learning. This issue of design for online learning is of particular importance because one of the outcomes from this study is to offer design consideration as implications for practice. Design of online environments is an important consideration. Ashar and Skene's (1993) work (in Rovai, 2002b) determined that social interaction features are what keep students enrolled in their course. Liu (2007) also found that social features, course collaboration and community aspects reduce feelings of isolation and the likeliness to drop a course. Specifically, synchronous communication technologies which provide social interactivity have been shown to be highly effective with online K-12 students (Oliver et al., 2010: Musgrove & Musgrove, 2004).

High levels of community attributes have been known to reduce feelings of loneliness and thereby student turnover within courses (Rovai, 2002a).For this reason, it is important to replicate methodologies which may enhance students' feelings of community within their classes. This research study demonstrated that course community attributes were in part produced by using synchronous, online learning technologies embedded within the structure of community of practice.

Moore's (1993) Theory of Transactional Distance provides a prescriptive measure for structuring the learning environment that is consistent with the autonomy needs of the learner to produce enhanced feelings of community (Rovai, 2002a). According to Moore, the less autonomous a student is, the more structure and dialogue that they need. Since students in online K-12 learning environments are still developing their learning autonomy, it is important that they receive the proper amount of structure and dialogue. Ng and Nicholas (2010) and Turvey (2006) determined that in grade school online learning environments, higher levels of structure are needed from the onset. A gradual lessening of scaffolds could be accomplished once students demonstrate independent interactions. Additionally, according to Moore (1993), more dialogue can provide needed support for less autonomous students.

The most significant finding from this study which has the most impact on future course design is that the highest turnover was found in the school where there was the lowest features of community and learning as determined by the modified Rovai Classroom Community Rating Scale (2002a). This information is very important because it reinforced the importance that course designers must place on establishing community features within K-12 online learning environments. Rovai already found this to be true (2002a) among college students and his theories apply to K-12 learning environments, where unprecedented growth is occurring in

online course design. This study revealed that community features which did enhance positive course feelings and which aided in student retention included the incorporation into the course of feelings of trust, full participation by students and the ability to meet frequently through face-to-face video interactions. Many of these features in course design must be addressed at the school rather than classroom level. The school institution must provide an environment which shows value for a spirit of community, provide the technology tools which have shown to be effective in establishing community and set expectations for the community features to be used by the instructors.

This research has provided insight into teachers' beliefs about learning community formation in their online classrooms and the benefits that these instructors see that these communities have provided their students. As a result of this study, implications for practice in K-12 online learning environments follow.

Implications for Practice

The following is a list of recommended methodologies and technologies that should be considered to be added to online courses to enhance students' feelings of community within their courses. This list stems from previous research and research that emanated from this study.

1. Provide synchronous opportunities for students to meet online and on-time. As stated in the findings, the synchronous classes which could be created using web conferencing software were found to be effective as discussed with the teachers in their interviews. These synchronous classes allowed teachers to give immediate feedback, and they were able to see the students converse as though they were in a face-to-face classroom environment.

2. Provide direct contact with instructor where the structure includes feedback on a timely basis. While all of the instructors reported that they got back to their students swiftly, immediacy of

feedback is helpful in reducing students' feelings of isolation and removes feelings of distance between the students and their teacher (Moore, 1993).

3. Provide opportunities for knowledge sharing both synchronously and asynchronously including digital discussions and group projects. On the most part, teachers indicated that the group work was beneficial to students' work and that they learned from one another. Assigning pair or group work could also reduce feelings of loneliness within the course.

4. Provide opportunities for students to hear and see other members of the community including the instructional staff through video conferencing technologies. Web School 2, which utilized web conferencing software had reported the highest student interaction and satisfaction levels by their teachers. These technologies have been known to reduce feelings of distance in distance education courses (Moore, 1993). The video conferencing technologies essentially provide face-to-face interaction because students and teachers can share their live images and respond immediately to student questions.

5. Develop an honor code to minimize issues of dishonesty and plagiarism. One of the biggest factors reported in these findings is that the feelings of mistrust undermined the full feeling of community formation in the Web School 1 where no honor code existed. An honor code could minimize feelings of mistrust or use of *Turnitin,* an Internet based plagiarism protection service, could prevent students from feeling they can cheat on assignments.

6. Seek full institutional support of the value of community in online learning. The instructional leadership must support the value of community in online courses. It was uncovered in the research that the school where there was the expectation to form communities and where teachers were given the technical tools and models to follow for community, had the highest feelings of community reported by the instructors. Institutional support should also include

sufficient training in the use of technologies for instructional staff so that instructors use interactive technologies in their instruction.

Conclusion

More than half of the states in the United States offer full time online schools for K-12 students (International Association for K-12 Online Learning, 2010). Use of K-12 online learning will continue to grow (U. S. Department of Education, 2009) and it is likely that online learning will be part of the majority of student's educational experiences (Smith, Clark & Blomeyer, 2005). Specifically, course development is fastest growing at the school district level (eSchool News Staff, 2010). It is important that there is a clear model to follow as new online courses are developed by school districts that are new to online course development.

Much of the research that has been done on successful online learning has been conducted in higher education learning environments (U.S. Department of Education, 2009). For decades, the higher education arena has published research on distance education best practices. Higher education researchers have found community to be integral to student's success in online learning environments (Liu, Magjuka, Bonk & Lee, 2007). Little has been known about the effective practices for K-12 online learning because few rigorous research studies have been conducted in this area (U. S. Department of Education, 2010; Wicks, 2010). This study presented evidence that can be used by the K-12 community to promote the importance of establishing community feelings within online courses. A sense of community aids in students' ability to thrive in an online environment, and this study provided a number of prescriptive items that have been shown to be effective that can be included in online learning environments.

This study demonstrated that community is important in K-12 education as has been reported in higher education (Rovai, 2002a). For this reason, this research also has application

for higher education too. As more students take K-12 online courses and have experiences from several course providers, they will join their colleges with prior knowledge and expectations of online education. Since feelings of community resulted in course persistence and thereby student retention, it is important that educators from K-20 learn how to effectively integrate community features into their course programming.

As online education grows throughout the United States and abroad, it is important for the educational community to determine how to develop effective practices in online learning which can be replicated as schools build web-based coursework and teachers prepare to deliver online curricula. The sense of community in the traditional brick-and-mortar classroom has long been a motivational factor for students in school. This research study can help the educational community determine the importance that community plays in providing student success in K-12 online learning and how communities are created and sustained. This research highlighted specific techniques and technologies instructors used to create a sense of community among online students. Additionally, the information derived from this study can help educators develop the skills they need to assist grade-school learners and to prepare them for their inevitable use of online learning as they enter college and professional life.

This study focused on the role that socially-networked communities play in grade-school online learning environments so that the social-cultural benefits of community in K-12 learning can be determined and if warranted, replicated. This is especially needed since to prepare students for their collegiate life, several states now even require online course completion as part of their high school graduation requirements (Davis, 2012).

It is also important that in an era where technology is being embraced to provide customized and individualized personal learning opportunities that the role of socially networked

communities are considered as part of the mix. These communities play an important role in the formation of socially constructed knowledge and can prove vital for new paradigms for learning.

Further research is needed in online education among K-12 students. While it is difficult to gain permission to interview K-12 students, their input into online K-12 learning will be valuable, especially in determining their course expectations. Additionally, further information is needed in online courses which include both K-12 students and adults together such as online family literacy programs.

Appendix A

INTERVIEW QUESTIONS

Subject Domain: _____   Grade Level _____

Course_____   Initials _____

Instructor Interview-The research questions will be coded according to their applicability to the research question strands. The open ended research questions are divided into themes which in are practices identified by Bailey and Card (2009) as effective pedagogy for on-line education.

1. **Community**   How would you define community in an on-line classroom environment?   What are some of the features that you believe that a community contains?   What role does community play in your course?
2. **Organization**   Please describe your class size and structure.   How frequently does the class meet and for how long?   What structures do you have in place that support on-line classroom management?
3. **Technology**   Which type of technologies do you use in the course?   For example do you use discussion boards? Chat features? Video conferencing?   Do you believe that student's prior use of technology contributes to their expectations of how the Internet can be used in your on-line classroom?
4. **Engagement**

Please describe some of the instructional strategies that you use in your on-line teaching practice? Do you have students introduce themselves? Share photos? Speak to each other? Work on group projects? If you do hold synchronous classes, which type of activities occur during these classes and how frequently do they occur? Discussion? Lecture? Sharing student work? Other? Have you noted any differences in the success of students who are more actively engaged in the social features (chat, discussion, Tweet) of the course?

5.**Communication/Collaboration**

Which type of collaborative learning techniques if any, do you use in your course? Indicate for each technique how frequently you use it and give an example of their use in the course: a) Break out Groups for Think/Pair and Share Activities, b) Partner Activities, c) Group Work, d) Debate, e) Literature Circles, f) Reciprocal Teaching and g) Other

6. **Timeliness**

Which techniques do you use as an instructor to be an active and visible member of your learning community? On average, how frequently do you communicate with students on an individual basis for instruction or feedback?

7. Fostering Relationships

How committed are students to social interactions such as talking about books, music, movies, clothes and travel as part of the course? In your opinion, how committed are students to working together to learn new things within the course?

Do you have students that provide peer-to-peer knowledge sharing with each other?

Do students have the opportunity to lead students in class discussions?

8.   **High Expectations** Which examples of student work would you say exemplify that a learning community exists? Why?
9. **Flexibility** Are there any things that you would like to add about the role of community in your class?

Appendix B

Pope Digital Artifact Observation:

Public Web Site, Course Description, Assessments and Syllabus

Class_____ Grade _____ Initials _____

Artifact _____

1. Which on-line course structures support learning and teaching in the on-line classroom? In what ways do these structures support independent learning? Collaborative learning?
2. How are classroom rules communicated in the on-line environment?
3. What type of time factors are in place to make certain students show respect for deadlines?
4. Does the course publicize any supplemental in-person activities that may contribute to the sense of community in the course?
5. Can knowledgeable guests and parents participate in on-line interactions or post to discussion forums?
6. How are on-line class activities and assignments communicated?
7. Are there technical resources built into the course that allow for students to work with other students to complete work?
8. Which type of technologies can be seen on the course web site and synchronous class that are community building type tools: chat, discussion boards, document sharing.
9. Do the assessments include collaborative work and feed-back?
10. Does the course utilize social network sites to promote the class meeting?

Appendix C

Questions to be used with interview and artifact data for evidence of community based upon Rovai Scale (2002b) and their possible relationship to three main research questions.

Rovai-Scale Influenced Questions-	Strongly Agree (SA) (2)	Agree (A) (1)	Neutral (N) (0)	Community	Methods and Strategies	Artifacts of Teaching	Other
Students in this course care about each other				X			
Students are encouraged to ask questions				X	X	X	
Students are connected to others in this course				X	X	X	
It is not hard for students to get help when they have a question				X	X	X	
There is a spirit of community in the course				X			
Students receive timely feedback					X		
This course is like a family				X			
Students are encouraged to expose gaps in their understanding				X			
Students are not isolated in this course				X	X		
Students are not reluctant to speak openly				X	X		
Students trust others in this course				X			
This course results in more than modest learning				X		X	
Students can rely on others in this course				X			
Students help each other learn				X			
Members of the course depend on each other				X			
Students are given ample opportunities to learn				X		X	
Students feel certain about others in this course				X			

Rovai-Scale Influenced Questions-	**Strongly Agree (SA) (2)**	**Agree (A) (1)**	**Neutral (N) (0)**	**Community**	**Methods and Strategies**	**Artifacts of Teaching**	**Other**
Student's educational needs are being met				X		X	
Students feel confident that others will support them				X			
This course promote a desire to learn				X			
Score Total							

Appendix D

Subject Domain: _____ Credit Course? _____ Grade Level _____Initials _____

Instructor Questionnaire-The research questions will be coded according to their

applicability to the research question strands. The "other" category with be further

separated as themes arise.

Guiding Questions	Instructor Beliefs About Community	Methods &Strategies Community	Artifacts of Teaching Evidence Community	Other
1. **Community** How would you define community in an on-line classroom environment? What are some of the features that you believe that a community contains? What role does community play in your course?	X	X		
3. **Technology** Which type of technologies do you use in the course? For example do you use discussion boards? Chat features? Video conferencing? Do you believe that student's prior use of technology contributes to their expectations of	X	X		

Guiding Questions	Instructor Beliefs	About Community	Methods &Strategies	Community	Artifacts of Teaching	Evidence Community	Other
how the Internet can be used in your on-line classroom? classes? Do you believe that the class size is a factor in community building?							
4. **Engagement** Please describe some of the instructional strategies that you use in your on-line teaching practice? Do you have students introduce themselves? Share photos? Speak to each other? Work on group projects? If you do hold synchronous classes, which type of activities occur during these classes and how frequently do they occur? Discussion? Lecture? Sharing student work? Other? Have you noted any differences in the success of students who are more actively engaged in the social features (chat, discussion, Tweet) of the course?	X		X				

Guiding Questions	Instructor Beliefs About Community	Methods &Strategies Community	Artifacts of Teaching Evidence Community	Other
5. **Communication/Collaboration** Which type of collaborative learning techniques if any, do you use in your course? Indicate for each technique how frequently you use it and give an example of their use in the course: a) Break out Groups for Think/Pair and Share Activities, b) Partner Activities, c) Group Work, d) Debate, e) Literature Circles, f) Reciprocal Teaching and g) Other		x		
6. **Timeliness** Which techniques do you use as an instructor to be an active and visible member of your learning community? On average, how frequently do you communicate with students on an individual basis for instruction or feedback?		X		

Guiding Questions	Instructor Beliefs About Community	Methods &Strategies Community	Artifacts of Teaching Evidence Community	Other
7. Fostering Relationships How committed are students to social interactions such as talking about books, music, movies, clothes and travel as part of the course? In your opinion, how committed are students to working together to learn new things within the course? Do you have students that provide peer-to-peer knowledge sharing with each other? Do students have the opportunity to lead students in class discussions?		X		
8. **High Expectations** Which examples of student work would you say exemplify that a learning community exists? Why?	X	X		

Guiding Questions	Instructor Beliefs About Community	Methods &Strategies Community	Artifacts of Teaching Evidence Community	Other
9. **Flexibility** Are there any things that you would like to add about the role of community in your class?	X			

Appendix E

Class Web Work Space Observation, Course Management System and Synchronous Class

Class_____Grade _____ Initials _____ Artifact_____

Guiding Questions	Instructor Beliefs About Community	Methods & Strategies To Promote Community	Artifacts of Teaching Evidencing Community	Other
1. Which structures support learning in teaching of the on-line classroom? How do these structures support independent learning?		X	X	
2. How are classroom rules communicated in the on-line environment?		X	X	
3. What type of time factors are in place to make certain students show respect for deadlines?		X	X	
4. Which technical features are present in the synchronous course?		X		
5. Do guests participate in on-line interactions?		X	X	
6. Description of online class activities.		X	X	
7. Are there resources that allow for students to work with other students to complete work?		X	X	
8. Which type of technologies can be seen on the course web site and synchronous class that are community building type tools: chat, discussion boards, document sharing.		X	X	

Appendix F

Pope: Digital Distance Learning Communities

Proposed Teacher Recruitment Form

September, 2011

Dear On-line Teacher:

You are invited to participate in a research study that is being conducted by me, Cynthia Pope, a doctoral student in the Rutgers University Graduate School of Education. The purpose of this research is to determine the role that community plays in Grade K-12 online learning. This research will look at the type of methodologies and techniques that teachers are using to keep students connected to their classrooms on-line. I would also like to observe teaching digital artifacts such as a public course website, syllabi, course descriptions and rubrics.

Approximately 5 adult subjects over 18 who are on-line teachers will participate in the study. The research study may take one year from beginning to end. The teacher interviews and course artifact review should not take more than one hour. I will conduct an initial interview of approximately 30 minutes which includes a series of questions. Next, I will review teaching artifacts for approximately 30 minutes. I plan to conduct the interviews and artifact review on-line using web conferencing software due to the distance. After I have written up my findings, you are welcome to view interview findings at a later date.

There are no foreseeable risks to participation in this study. Your name will not be used in connection with the findings. The data will be kept confidential. I will record a code for your interview and artifacts but I will not link your name to the documents. I will never present or publish your name in any research findings. The Institutional Review Board at Rutgers University and my dissertation committee are the only ones who will have access to the data. The data from this study will be maintained for three years.

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The benefit of taking part in this study is to give the educational community a better understanding of how to design on-line learning environments for K-12 students. You will receive no direct benefit from taking part in this study though the findings of the study will be shared with you at your request. Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

Subject's Initials _____

If you have any questions about the study or study procedures, you may contact me-

Mrs. Cynthia Pope, Kingwood Township School District, 880 County Road 519, Frenchtown, NJ, Phone: 908-996-2941 (x218), E-Mail: cpope@kingwoodschool.org

You may also contact my faculty advisor for this project-

Dr. Erica Boling, Rutgers University Graduate School of Education, 10 Seminary Place, New Brunswick, NJ 08901, 908-227-2963, E-Mail:erica.boling@gse.rutgers.edu

Sign below if you agree to participate in this research study:

Subject's Initials _____

If you have any questions about your rights as a research subject, you may contact the IRB Administrator at Rutgers University at:

Rutgers University, the State University of New Jersey

Institutional Review Board for the Protection of Human Subjects

Office of Research and Sponsored Programs

3 Rutgers Plaza

New Brunswick, NJ 08901-8559

Tel: 732-932-0150 ext. 2104

Email: humansubjects@orsp.rutgers.edu

You will be given a copy of this consent form for your records.

Sign below if you agree to participate in this research study:

Subject (Print) _____

Subject Signature _____Date _____

Principal Investigator Signature _____

Date_____

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PROPOSED AUDIO/VIDEOTAPE ADDENDUM TO CONSENT FORM

I am asking for your permission to allow me to audiotape and video tape part of the research study.

You do not have to agree to be recorded in order to participate in the study.

The recording(s) will be used for analysis by the research team.

The recording(s) will include interview information about your teaching beliefs, knowledge and practices but will not include your name only a code so that the investigator may identify you.

The recording(s) will be stored online and linked with a code to subjects' identity the recording(s) will be retained for up to two years and destroyed upon completion of the study.

Your signature on this form grants the investigator named above permission to record you as described above during participation in the above-referenced study. The investigator will not use the recording(s) for any other reason than that/those stated in the consent form without your written permission.

Subject (Print) _____

Subject Signature _____

Date _____

Principal Investigator Signature _____

Date _____

Table 1Transcript Comment Code Applications

Transcript Interview Comments	Code Application Themes									
	Communication	Community	Engagement	Flexibility	Fostering Relationships	High Expectations	Organization	Technology	Timeliness	Totals
WS1-1	9	2	4	1	8	2	7	3	2	38
WS1-2	4	10	8	2	12	5	15	6	15	77
WS1-3	2	5	2	3	9	3	9	6	2	41
WS1-4	0	2	7	4	2	0	2	3	5	25
WS1-5	1	3	1	5	4	5	11	10	5	45
WS2-1	5	12	13	2	14	3	8	9	4	70
WS2-2	3	3	9	1	6	1	7	5	4	39
WS2-3	1	1	4	4	3	1	4	4	3	25
Total	25	38	48	22	58	20	63	46	40	360

Note. Code Application Themes. Adapted from "Effective Pedagogical Practices for Online Teaching: Perception of Experienced Instructors" by C. Bailey & K. Card (2009), *Internet and Higher Education*, 12(3), 152-155.

TABLE 2 Individual Instructor Statements Defining Communities of Practice Components

Subject/Grade/ Course Length	Class Size Range	Individual Instructor Community Comments	Community	Domain	Practice
WS1-1 Honors Gr. 11-12 15 Weeks	20-25	It helps the kids with the discussions if they feel that they know each other, so we spend the first two weeks – the first week is almost entirely devoted to community. The second week, we have a little bit extra in there. And then after that, there's a separate chat room where they can go – it's called Recess – and they can go in there and talk about anything.	X		X
WS1-2 General Gr. 10-12 15 Weeks	20-25	Students may be separated by hundreds, even thousands of miles, but they're in fairly intimate communication with each other through weekly discussions, critique of each other's work, and through group projects… A community will get to know each other's strengths and weaknesses, and with this understanding the individuals can support and encourage each other, and at times politely 'kick each other in the pants' as motivation to work harder. Community is a large part of the class, and one that many students don't appreciate. They're forced to work together and to comment on each other's work, and many find this to be tedious.	X		X

Subject/Grade	Class Size Range	Individual Instructor Community Comments	Community	Domain	Practice
WS1-3 Honors Gr. 10-12 15 Weeks Web School 1	25 Max	…they will be engaged daily or every other day, and that they will honestly discuss with one another what is going on the in the classroom, and that they feel that it's a safe environment for them to interact and talk with one another. …I think that the idea of trust has to built early on in the class so that when we have team classrooms and Wikis, they know that they can work well with one another and if they ask another person to do this part of the project, they know that that person is going to come back to it and fulfill that and do that. …Setting up discussions where they really interact and get to know one another and some kind of team building activity is really key, and then from that that they show that they are going to show up to class, and do their part, is a big part of the community…I think in our courses, the community is a huge part of it.	X		

Subject/Grade/ Course Length	Class Size Range	Individual Instructor Community Comments	Community	Domain	Practice
WS1-4 Honors Gr. 10-12 15 Weeks Web School 1	25 Max	Universally, to them, the community was that communication that existed in the discussion groups and built over time. The give and take, the questions, and the area that is for questions - there was a lot of give and take there, a lot of: "How do you do this?" You can get answers from me or you can get answers from other students. I think the other place where we saw a lot of that there were two projects that the kids, as they were making their goodbyes, were saying "it was so great working with these people in my group, it was really nice." So I think that- So the community becomes built into the discussions.	X	X	X
WS1-5 Gr. 9-12 Full Year Web School 1	18-25	The students being able discuss things with each other using proper etiquette and including the whole group in conversations. As a matter of fact, when I write out the requirements for each one, it will say that you have to- They have an initial post, and then you have to reply to different students…We have to have one group project each semester because AP Spanish is a full-year course. They have to be able to work together for those projects.	X	X	X

Subject/Grade/ Course Length	Class Size Range	Individual Instructor Community Comments	Community	Domain	Practice
WS2-1 University Level Gr. 9-12 Semester Web School 2	5-8	To me, community in an online classroom means very much what community in a physical classroom means. You come in- At the beginning of the semester some students already know each other, some students don't, but then it's this sort of chatting before the official class discussion starts that gets some sort of community building. And then of course the discuss whether it's something that they are assigned to do outside of the classroom, or whether they spontaneously make these study groups outside of the classroom using other tools to connect, such as *Skype* for instance, the community then continues beyond the classroom. It's that exchange of ideas involved students engage in.			
WS2-2 Core Level Gr. 9-10 Full Year	15-20	I was thinking more about the community as a school. But it's not that, it's more like a classroom. I would say then it's the instructor and students that form the community.	X		

Subject/Grade/ Course Length	Class Size Range	Individual Instructor Community Comments	Community	Domain	Practice
WS2-3 Gr. 12 Full Year Gr. 12 Semester	8-15	I think community in the online classroom environment involves students feeling connected to one another in regards to academics, but also in regards to non-academic social situations. I think it's important that students know one another, that they're comfortable with one another, and that students are forming study groups much like they would in a traditional setting. I think that having students present problems or solutions or papers or other types of things to one another is an important feature of community within the course, and I think that is one way in which community plays a role in my particular courses. There are a number of presentations during each class session. I think it comes down to students being comfortable with one another, students knowing each other both in terms of academics and in more social situations, but also just students being connected to one another.	X	X	X

Table 3- Consolidated Case Artifacts Analysis Instrument

Class Web Work Space Observation, Course Management System and Synchronous Class

Case- Web School 1_____   Artifacts: Public Web Site & Teacher Documents

Guiding Questions	Methods & Strategies	Artifacts of Teaching	Comments
1. Which structures support learning in teaching of the online classroom? How do these structures support independent learning?	X	X	Use of Desire2Learn platform for co-synchronous e-learning. An instructor said, "..all of the School classes are the same where the first week is basically a 'get to know each other' week." Self Correcting Quizzes are used.
2. How are classroom rules communicated in the online environment?	X	X	School Academic Policies and Syllabus communicate rules.
3. What type of time factors are in place to make certain students show respect for deadlines?	X	X	Specified due dates are assigned. Course weeks open and close in intervals.
4. Which technical features are present in the synchronous course?	X		No synchronous features in most courses. *Wimba* is used in one class. Audio announcements are used in classes.

Guiding Questions	Methods & Strategies	Artifacts of Teaching	Comments
4. Which technical features are present in the synchronous course?			*Elluminate* web conferencing software is available but no one mentioned using it.
5. Do guests participate in online interactions?	X	X	No
6. Description of online class activities.	X	X	Not Applicable
7. Are there resources that allow for students to work with other students to complete work?	X	X	Wikis, blogs, discussions, journals are available to debate, analyze, and create group work assignments.
8. Which type of technologies can be seen on the course web site and synchronous class that are community building type tools: chat, discussion boards, document sharing.	X	X	School website, course site, online status allows for chatting, discussion forums, private topics, Student Lounge and Water Cooler are used.

TABLE 4- Consolidated Case Artifacts Analysis Instrument

Class Web Work Space Observation, Course Management System and Synchronous Class

Case- Web School 2____ Grade 9-12_____ Artifacts: Public Web Site & Teacher Documents

Guiding Questions	Methods & Strategies	Artifacts of Teaching	Web School 2 Comments
1. Which structures support learning in teaching of the online classroom? How do these structures support independent learning?	X	X	eCollege Course Management, Power School and Web Conferencing Software are used in the courses. Course Management allows for independent and collegial learning.
2. How are classroom rules communicated in the online environment?	X	X	The Syllabus includes Course Policies, Family Handbook, Guidelines, and a Code of Honor Required to be signed for Proctored Exams.
3. What type of time factors are in place to make certain students show respect for deadlines?	X	X	An instructor communicated, "48 hours after the deadline, students will get half credit, and after 48 hours, they will get 0 credit for minor assignments like quizzes, weekly quizzes and so forth. For every 24 hours, for more major assignments like writing assignments … students will get half credit penalty."
4. Which technical features are present in the synchronous course?	X		Microphones, Video Cameras, White Boards, Slide Sharing, Application sharing tools and text chat are used in the course.
5. Do guests participate in online interactions?	X	X	The professor video lectures before online class discussion.

Guiding Questions	Methods & Strategies	Artifacts of Teaching	Web School 2 Comments
6. Description of online class activities.	X	X	On line class activities include discussion forums, mathematics problem solving and discussion seminars.
7. Are there resources that allow for students to work with other students to complete work?	X	X	Students use *Skype* with one another. Online web conferencing break-out sessions, Interactive whiteboard, Google Documents Sharing are used.
8. Which type of technologies can be seen on the course web site and synchronous class that are community building type tools: chat, discussion boards, document sharing.	X	X	School website promotes online classroom. Synchronous discussions, real-time video-conferencing, instructional slide sharing, online whiteboard, application sharing and text chat are used. Students mark up slides, write on the whiteboard and raise their hands to be acknowledged to speak by the instructor through microphones. Students also text message and text chat debate.

TABLE 5 WEB SCHOOL 1 & 2 THEME DEFINITION TABLE

Theme	Definition	Example
Organization	The class size and structure in place for the course.	There are roughly four hours of meeting per week, well, five hours, and two and a half of those hours are things that students do on their own time, so these are pre-recorded lectures that students watch. And then for two and a half hours per week, it's synchronous, real-time video conferencing when students are in the discussion section, all at the same time, and all with me. WS2-1
Technology	The types of technologies used in the course and the expectations students have of these technologies based on prior experiences.	..one of the groups was having a hard time figuring what each other was doing and connecting it, and one of the girls wanted to do live chatting, so what she had them all do-- and I found this out afterwards-- is friend each other on *Facebook* so that they could do live chat. [Laughter] You know? So definitely, their experience in internet and use of it affects how they're going to contribute and what they're going to do in the class.WS1-3
Engagement	The instructional strategies used in the class and the relationship between student's active participation in social interaction and course success.	…in general I think the students that are most actively engaged in the social features are the ones that are performing best in the course. I think part of that is just because they're able to more actively form study groups with other students; when they're already talking to them socially, it's easy to say, "Hey, did you solve number five?

Theme	Definition	Example
		Can we talk about that?" I definitely think that being engaged socially contributes to success. WS2-3
Communication/Collaboration	The types of collaborative learning techniques used in the class.	Other than the chat area being somewhat disappointing because everyone has to be on at the same time, I would say that communication is the student's biggest "bugaboo." They wish they could communicate directly, more like what is happening right now. WS1-2
Timeliness	The techniques that the instructor used to be a member of the learning community including the frequency and immediacy of feedback.	I check in everyday, twice a day. I answer questions and I will occasionally comment in some of those on-going discussions. I make sure especially that at the very beginning of the course, those first two to three weeks, that I participate at least once in every discussion line that starts so that the kids know that I really am there reading. WS1-4
Fostering Relationships	Student's commitment to social interactions within the course, peer-knowledge sharing and student leadership.	Sometimes in the text chat, I see some of them bring up something related that they discussed in a different course, and they start debating that in the text chat and going back and forth about it. And then like I said in those minutes before I class, I do see them talking about the extracurricular activities that they are engaged in, so they are usually on topic. WS2-1

Theme	Definition	Example
High Expectations	Student work examples that exemplify the existence of a learning community.	As difficult as it is to form a community when you're not seeing each other and taking to each other just as we are right now, they do need to comment on each other's work. Almost every week there's something where they have to look at each other's work and comment about it. So words do get back and forth between them, and because of that, the kids know each other fairly well. They get to know who is really on it and doing some deep thinking, and who is not really working their hardest in the class. WS1-2
Flexibility	Additional items that address the role of community including a parallel to face-to-face learning.	I really do think that our students are more connected to each other than my students in the regular university world. I think that, you know, people make more of an effort to connect with one another in the online community, so I think that results overall in closer community and closer connections.WS2-3

TABLE 6 WEB HIGH SCHOOL 1 Rovai Classroom Community Scale

Strongly Agree = SA/2, Agree=A/1, Neutral N/0

Rovai-Scale Influenced Questions-	1	2	3	4	5	WEB SCHOOL 1 COMMENTS
Students in this course care about each other	SA	N	A	A	A	They do share with each other- Sometimes I'm surprised because some kids say, "I have an eating disorder" or "My sister has schizophrenia," so they are actually very open about what they share. WS1-1
Students are encouraged to ask questions	SA	SA	SA	SA	SA	…all of the classes have an area where students can ask questions, and from the start I encouraged the other students to answer the questions before I go back and answer them. WS1-3
Students are connected to others in this course	SA	A	A	A	A	…they'll say some connection which shows that they learned something new from the other student, but it's not necessarily into that formal document that they may be submitting as an assignment or something like that. It's more of an informal kind of thing. WS1-1
It is not hard for students to get help when they have a question	SA	SA	A	A	A	Since not every student needs help or comments on work each day, I make contact with each student about two or three times a week. Some students need extra reassurance, so I connect with them almost daily throughout the semester, while others work quite independently. WS1-2
There is a spirit of community in the course	A	N	A	A	A	But this is psychology, so every week, even if it's not- They have so much to bring to the table, so I think community is very strong in this course. WS1-1
Students receive timely feedback	SA	SA	SA	SA	SA	I usually get back to them within a couple of hours, but sometimes it's immediately. WS1-1

Rovai-Scale Influenced Questions-	1	2	3	4	5	WEB SCHOOL 1 COMMENTS
This course is like a family	N	N	N	N	N	I don't think it's going to be a really close-knit community that gets formed. WS1-2
Students are encouraged to expose gaps in their understanding	N	N	N	N	N	I have had enough difficulty getting the students set up on [*Wimba*] that I haven't attempted trying to use *Elluminate Live* with them.WS1-5
Students are not isolated in this course	A	N	A	A	A	They're pretty much on their own, and for some of them it's their first time on their own actually needing to do things like an adult. WS1-2
Students are not reluctant to speak openly	S A	N	A	A	A	…nobody's going to hold it against you, and nobody is going to question you about it in the hallway. And it's not going to be something where somebody says, "Oh, I can't believe what she said." I think they really appreciated that…WS1-4
Students trust others in this course	S A	N	S A	A	A	I think that the idea of trust has to built early on in the class so that when we have team classrooms and Wikis, they know that they can work well with one another. WS1-3
This course results in more than modest learning	A	S A	A	S A	S A	It's grades 9 – 12 but because it's an honors course, it's primarily juniors and seniors. The debates that they got into over you know, genetic testing, it becomes sort of like there really is – who wants to talk about anything else?WS1-4
Students can rely on others in this course	A	N	A	S A	A	The groups are small, so some groups turn out to be pairs when some individuals turn out to not participate, which does happen. WS1-2

Rovai-Scale Influenced Questions-	1	2	3	4	5	WEB SCHOOL 1 COMMENTS
Students help each other learn	A	A	A	SA	SA	Perhaps 10% of the time they will notice areas of difficulty and point it out to their peers in order to help them and get to help them too. WS1-2
Members of the course depend on each other	N	N	SA	SA	A	…if they ask another person to do this part of the project, they know that that person is going to come back to it and fulfill that and do that. WS1-3
Students are given ample opportunities to learn	A	A	A	A	A	I do have some kids that I really do have to walk them through every step or I'm contacting the site coordinator a lot to get them moving. WS1-5
Students feel certain about others in this course	N	A	A	A	A	They get to know who is really on it and doing some deep thinking, and who is not really working their hardest in the class. WS1-2
Student's educational needs are being met	A	A	A	A	A	You just put something in my mind. I think the students might appreciate seeing me *yack* at them. I could video tape myself- not video tape, whatever the expression is- shoot myself telling them, "This is what I want you to do." They might like that. WS1-2
Students feel confident that others will support them	A	A	SA	SA	SA	They're pretty much on their own, and for some of them it's their first time on their own actually needing to do things like an adult. WS1-2
This course promote a desire to learn	A	A	A	SA	A	For the most part, students are extremely committed to learning this material, but they tend to work on it alone. WS1-2

Rovai-Scale Influenced Questions-	1	2	3	4	5	WEB SCHOOL 1 COMMENTS
Score Total	23	15	23	26	23	

Note. Web School 1 Classroom Community Scale Responses. Adapted from "Development of an instrument to measure classroom community," A.P Rovai, A. P., *Internet and Higher Education*,5(3), 197-211, 2002.Adapted with permission.

TABLE 7 WEB HIGH SCHOOL 2 Rovai Classroom Community Scale

Strongly Agree = SA/2, Agree=A/1, Neutral N/0

Rovai-Scale Influenced Questions-	1	2	3	WEB HIGH SCHOOL 2 COMMENTS
Students in this course care about each other	A	A	A	…they find like-minded peers – it's really a sort of meeting of the minds – so they can belong to this community in this online environment that they very well may not have otherwise been able to belong to if it were not online. WS2-1
Students are encouraged to ask questions	SA	A	SA	I give them the questions ahead of time, and when they ask whether they can discuss them with each other, I encourage them to do so because that really is just a fuller extension of what we've been doing in class. I structure assignments in such a way as to build those connections between them. WS2-1
Students are connected to others in this course	A	A	A	And then typically we rarely have enough time to cover what we want to cover in a class period anyway, but having them do that outside of the formal class meeting time helps establish those connections and then build that community that is very evident than in a classroom. WS2-1
It is not hard for students to get help when they have a question	SA	A	SA	…so we have a regular time when students can pop in and ask us questions. WS2-1
There is a spirit of community in the course	SA	SA	SA	I encourage them to collaborate outside of the class. I have students engaged, when appropriate, in peer review of each other's work. WS2-1
Students receive timely feedback	A	A	A	..an average of weekly, outside of class, giving them feedback on their work. WS2-1
This course is like a family	A	SA	SA	The core division I …is really based on the spirit of interdisciplinary spirit, taking various ideas from different disciplines. So all students are challenged, in core courses, in various ways- Like math-oriented

Rovai-Scale Influenced Questions-	1	2	3	WEB HIGH SCHOOL 2 COMMENTS
				students are challenged by the humanities content of the course. WS2-1
Students are encouraged to expose gaps in their understanding	N	N	A	If a student hasn't done well, then I'll meet with them individually to go over their assignments. WS2-3
Students are not isolated in this course	SA	SA	A	I can tell immediately which students are close and connected enough that they're probably talking actively outside of class, and like I said, I try to pair up students who might not know other students in the class as well. WS2-1
Students are not reluctant to speak openly	A	A	SA	But when you're having that conversation in a text chat that everybody can read, then that actually pulls in the other people in the classroom into that conversation. WS2-1
Students trust others in this course	N	N	A	I mean, we attract the population of students that, in general, are fairly advanced, and so sometimes those students can be- prefer to work independently, but once they get- Once they understand the idea that their peers are advanced, then they really like to learn from one another. ..I think they're definitely committed to learning new things together. WS2-3
This course results in more than modest learning	SA	SA	SA	…advanced level history courses. WS2-1
Students can rely on others in this course	A	A	A	…students get one extra assigned discussion section and they are supposed to be the expert of that assigned lecture. I'm going to list some of the discussion topics that's going to be done by me, but students in the class respond to these points that I've listed, but the student expert is supposed to respond to other peoples' responses to these points; I think that's one method of reciprocal teaching. WS2-2

Rovai-Scale Influenced Questions-	1	2	3	WEB HIGH SCHOOL 2 COMMENTS
Students help each other learn	SA	SA	A	..it seems like they may have the opportunity to work very intensively with helping each other out with their shared work. It's not shared work, but in the comments of the peer review. WS2-1
Members of the course depend on each other	SA	SA	A	We find that students are very supportive of each other. WS2-1
Students are given ample opportunities to learn	SA	SA	SA	If I see that students are not contributing readily or frequently to discussion, I call on them; quite literally, I call them through the microphones. WS2-1
Students feel certain about others in this course	A	SA	SA	I see some correlation between how often students make use of the opportunity of group work and the grades that they get for projects like papers. WS2-2
Student's educational needs are being met	SA	SA	A	Different teachers make use of different features based on what the needs of the class are. WS2-1
Students feel confident that others will support them	SA	A	A	Students who I see who might need a little more support; I invite them to visit with me in office hours or speak with me over the phone. WS2-1
This course promote a desire to learn	A	A	A	The assignments that they're assigned are significant assignments; they have midterms, finals, essays, projects they work on together, problem sets. WS2-1
Score Total	28	27	28	

Note. Web School 2 Classroom Community Scale Responses. Adapted from "Development of an instrument to measure classroom community," A.P Rovai, A. P., Internet and Higher Education 5(3), 197-211, 2002.Adapted with permission.
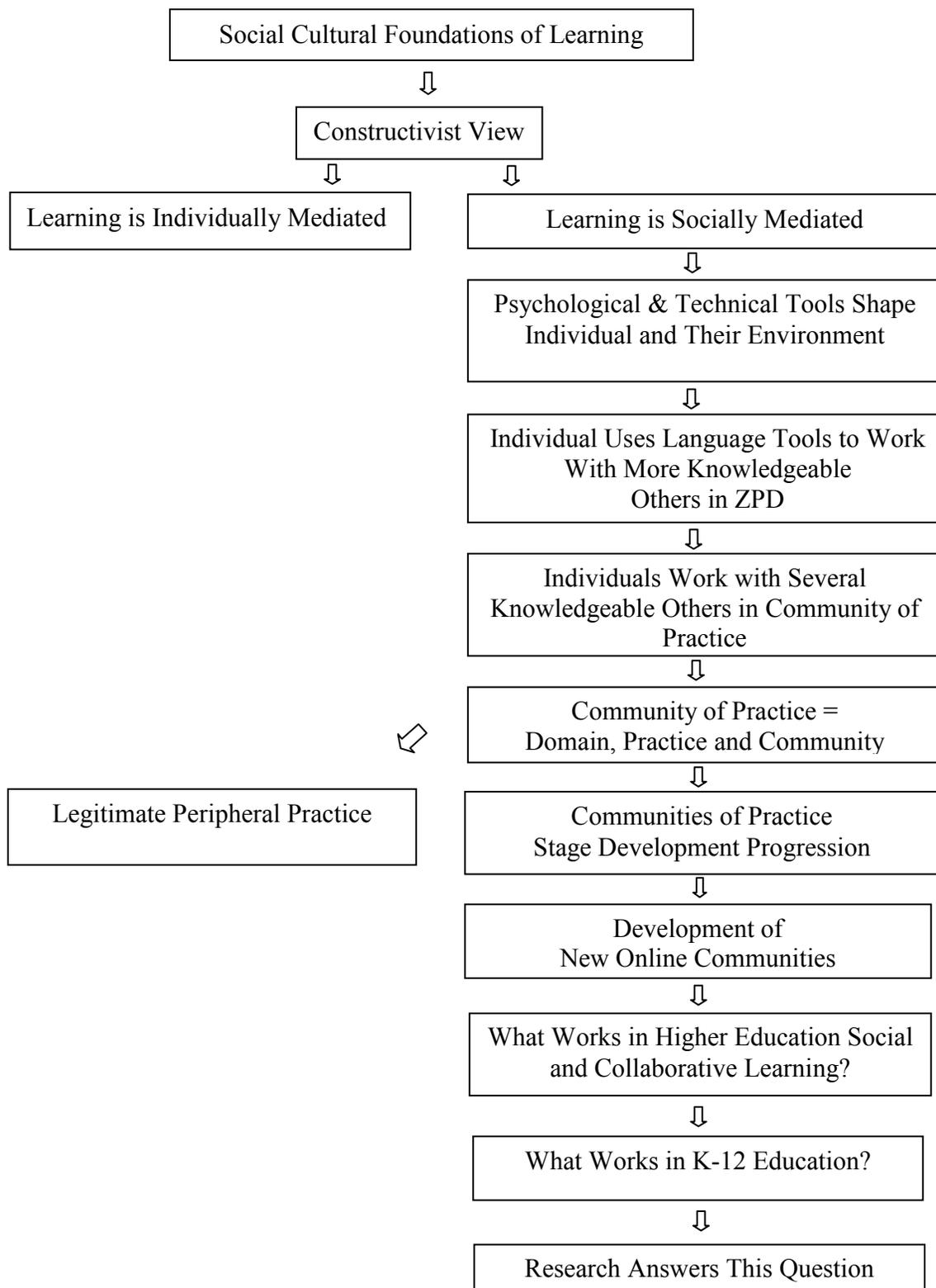
Figure 1. Pope *Conceptual Framework*

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            │  Constructivist View │
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                           │ Psychological & Technical Tools    │
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                           │ Individual Uses Language Tools to   │
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                           │ Individuals Work with Several       │
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                           │ Community of Practice =             │
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│ Legitimate Peripheral        │   │ Communities of Practice        │
│ Practice                     │   │ Stage Development Progression  │
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                           │ Development of                      │
                           │ New Online Communities              │
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                           │ What Works in Higher Education      │
                           │ Social and Collaborative Learning?  │
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                           │ What Works in K-12 Education?       │
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                           │ Research Answers This Question      │
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Figure 2. Digital Distance Learning Community Framework

Individual Learner

⇓

Joins Online Learning Community
Formed Around
Content Domain and
Practice Geared to Achievement

⇓

More Knowledgeable   Learner Membership in   Computer Mediation
Instructor   Digital Community   Tools
Infuses Web 2.0 Tools   ⇒   Fosters Knowledge and Skills   ⇐   Support Dialog and
As Social Features   With Knowledgeable Others   Online Learning
Conferences, Wikis,   Structure
Blogs, Video

⇓

More Knowledgeable Individual
Produced Through Scholastic Collaboration
and Socialization Process

⇓

More Knowledgeable Individual
Joins Other Learning Communities

Figure 3. Digital Distance Learning Community of Practice Structure

Practice= Community Participation

Community=

Spirit of Connectedness

Trust

Interdependence

DIGITAL Domain

References

Bailey, C. & Card, K. (2009). Effective pedagogical practices for online teaching: Perception of experienced instructors. *Internet and Higher Education*, 12(3), 152-155.

Barab, S. & Duffy, T. (2000). From practice fields to communities of practice. In D. Jonassen & S. M. Land (Eds.) *Theoretical Foundations of Learning Environments*, (pp. 25-56). Mahwah, NJ: Lawrence Erlbaum.

Barbour, M. & Plough, C. (2009). Social networking in cyberschooling: Helping to make online learning less isolating, *TechTrends: Linking Research and Practice to Improve Learning*, 53(4), 56-60.

Boling, E. & Beatty, J. (2010). Cognitive apprenticeship in computer-mediated feedback: Creating a classroom environment to increase feedback and learning. *Journal of Educational* Computer Research, 43(1), 47-65.

Boling, E., Beatty, J., & Partin, J. (2008). Adolescent literacy and online discussions: Enhancing learning opportunities in the English classroom. *Information Technology,* Education and Society, 9(1), 71-92.

Borthwick, A., Hansen, R., Gray, L. & Ziemann, I. (2008). Exploring essential conditions: A commentary on Bull et al. (2008). *Contemporary Issues in Technology and Teacher Education*, *8*(3). Retrieved from http://www.citejournal.org/vol8/iss3/editorial/article2.cfm

boyd, d. m., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. Journal of Computer-Mediated Communication, *13*(1),Retrieved from http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html

Brown, J., Collins, A. & Duguid, P, (1989).Situated cognition and the culture of learning, *Educational Researcher*, 18 (1), 32-42.

Bruner, J. (1997). Celebrating divergence: Piaget and Vygotsky. *Human Development, 40(1),* 63-73.

Cavanaugh, C., Barbour, M., Brown, R., Diamond, D., Lowes, S., Powell, A., Rose, R., Scheick, A., Scribner, D. & Van derMolen, J. (2009). *Examining communication and interaction in online teaching*. Retrieved from http://www.inacol.org/research/docs/NACOL_QualityTeaching-lr.pdf

Cavanaugh, C., Barbour, M. & Clark, T., (2009). Research and practice in K-12 online learning: review of open access literature, *The International Review of Research in Open and Distance Learning*. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/607/1182

Chickering, A. & Ehrman, S. (1996). Implementing the seven principles: Technology as a lever. *American Association for Higher Education Bulletin,*10, 3-6

Chickering, A.W. & Gamson, A.F. (1987). *Seven principles for good practice in undergraduate education*. Racine, WI: The Johnson Foundation, Inc.

Christensen, C. & Horn, M. (2008). How do we transform our schools? *Education Next*, 8 (3). Retrieved from http://educationnext.org/how-do-we-transform-our-schools

Collins, A., Joseph, D. & Bielaczyc, K. (2004). Design Research: Theoretical and Methodological Issues. *Journal of the Learning Sciences*, 13(1), 105-114.

Creswell, J. (2007). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*, Thousand Oaks, CA: Sage.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39 (3), 124-130.

Davis, M. (2012). Districts require e-courses for graduation, *Education Week*. Retrieved from http://www.edweek.org/ew/articles/2012/08/29/02el-requirement.h32.html

Dawley, L**.** (2009). Social network knowledge construction: Emerging virtual world pedagogy. *On The Horizon 17* (2), 109-121.Retreived from http://edtech.boisestate.edu/ldawley/SNKC_pdf.pdf

Dawley, L**.** (2010). *Research roundup: Online learning, a quick reference on the science behind virtual schooling.* Report prepared for Edutopia, George Lucas Foundation. Retrieved from http://www.edutopia.org/stw-online-learning-research-roundup

DiPietro, M., Ferdig, R., Black, E., & Preston, M. (2008). Best practices in teaching K–12 online: Lessons learned from Michigan Virtual School teachers. *Journal of Interactive Online Learning*, 7, 10–35.

Duffy-Lever, J. & McDonald, J. (2011).*Teaching and Learning with Technology*, Boston: Allyn & Bacon.

Ertmer, P. (2005) Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, 53, (4), 25–39. Retrieved from http://www.edci.purdue.edu/ertmer/docs/AERA06_TchrBeliefs.pdf

eSchool News (2010), *Growth of online instruction continues, though unevenly*. Retrieved from http://www.eschoolnews.com/2010/11/16/growth-of-online-instruction-continues-though-unevenly

Gee, J. P. (1996). *Social linguistics and literacies: Ideology in discourses* (2nd ed.). London: Falmer.

Gee. J. P. (2004). *Situated language and learning: A critique of traditional schooling*. London: Routledge.

Greenhow, C. & Robelia, B. (2009), Old communication, new literacies: Social network sites as social learning resources. *Journal of Computer-Mediated Communication*, 14 (4), 1130–1161. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.2009.01484.x/full

Greenhow, C., Robelia, E., & Hughes, J. (2009). Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, 38 (4), 246-259.

Gunawardena, C., Hermans, M., Sanchez, C., Richmond, C., Boley, M. & Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools, *Educational Media International*, 46 (1), 3-16.

Harasim, L. (2000). Shift happens: online education as a new paradigm in learning. Internet and Higher Education, 3, 41-61.

Heuer, B. & King, K. P. (2004). Leading the band: The role of the online instructor for educators. *Journal of Interactive Online Learning*, 3,1.

Hiltz, S. (1998) *Collaborative learning in asynchronous learning networks: Building learning communities,* Paper presented at WEB98 Conference, Orlando, Florida. Retrieved from http://eric.ed.gov/PDFS/ED427705.pdf

Hiltz, S. & Turoff, M. (2002). What makes learning networks effective? *Communications of the ACM*, 45, (4), 56-59.

Holcomb, L., Brady, K. & Smith, B. (2010). The emergence of "educational networking": Can non-commercial, education-based social networking sites really address the privacy and

safety concerns of educators? *Journal of Online Learning and Teaching*, 6(2).

Retrieved from http://jolt.merlot.org/vol6no2/holcomb_0610.pdf

Inderscience Publishers (2011). *Social learning: Can Facebook and related tools improve*

educational outcomes? Retrieved from

http://www.sciencedaily.com/releases/2011/05/110509091557.htm

International Association for K-12 Online Learning. (2010). *Fast facts on online learning,*

where courses are being designed. Retrieved from

http://www.inacol.org/press/nacol_fast_facts.pdf

Ito, M., Horst, H., Bittanti, M., boyd, d., Herr-Stephenson, B., Lange, P., Pascoe, C. & Robinson,

L. (2008). *Living and learning with new media: Summary of findings from the digital*

youth project. The John D. and Catherine T. MacArthur Foundation Reports on Digital

Media and Learning. Retrieved from

http://digitalyouth.ischool.berkeley.edu/files/report/digitalyouth-TwoPageSummary.pdf

Jones, N., Blackney, H., Fitzsibbon, K., & Chew, E. (2009). Get out of my space! *Computers*

and Education, 54, 776-782.

Kaplan, J. (2009). *Getting ready for the Google generation*. Retrieved from

http://www.ecommercetimes.com/rsstory/68097.html

Knobel, M. & Lankshear, C. (2006). Weblog worlds and constructions of effective and

powerful writing: Cross with care, and only where signs permit. In K. Pahl & J. Rowsell

(eds), *Travel notes from the new literacy studies: Instances of practice*. Clevedon, UK:

Multilingual Matters.

Koohang, A. Floyd, K., Smith, T. & Skovira, R. (2010). The hype of using social networking as

a tool for learning in e-learning. *Issues in Information Systems*, 11(2), 30-36.Retrieved

online http://www.iacis.org/iis/2010_iis/Table%20of%20Contents%20No2_files/30-36_LV2010_1398.pdf

Lave, J. (1993). Situating learning in communities of practice. In L. B. Resnick, J. M. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 17-36). Washington, DC: American Psychological Association.

Lave, J. & Wenger, E. (1991). *Situated learning. Legitimate peripheral participation.* Cambridge, England: Cambridge University Press.

Lenhart, A., Madden, M., Macgill, A.R., & Smith, A. (2007). *Teens and social media: The use of social media gains a greater foothold in teen life as they embrace the conversational nature of interactive on-line media.* Retrieved from Pew Internet and American Life Project website: http://www.pewinternet.org/Reports/2007/Teens-and-Social-Media.aspx

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social media & mobile internet use among teens and young adults. Pew Internet & American Life Project. Retrieved from http://www.pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx?r=1

Liu, X., Magjuka, R., Bonk, C. & Lee, S. (2006). Does sense of community matter? An examination of participants' perspectives in online courses. In T. Reeves & S. Yamashita (Eds.). *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education,2006,* 2615-2621. Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/24101

Mazer, J. P. & Murphy, E. (2007). I'll see you on "Facebook": The effects of computer-mediated teacher self-disclosure on student motivation, affective learning, and classroom climate, *Communication Education*, 56, 1 – 17.

McBrien, L., Jones, P. & Cheng, N. (2009). Virtual spaces: employing a synchronous online classroom to facilitate student engagement in online learning. *International Review of Research in Open and Distance Learning*, *10* (3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/605/1264

Miles, M. & Huberman, A. (1994). *Qualitative data analysis: A sourcebook of new methods*, Thousand Oaks, CA: Sage.

Miller, P. (2002).*Theories of developmental psychology*, New York, NY: Worth Publishers.

Moore, M. G. (1993).Theory of transactional distance. In D. Keegan (Ed.), *Theoretical Principles of distance education*. (p 22-38) New York: Routledge.

Morrow, L. M. (2002).*The literacy center: Contexts for reading and writing*. Portland, ME: Stenhouse Publishers.

Musgrove, A. & Musgrove, G. (2004). Online learning and the younger student: Theoretical and practical applications. *Information Technology in Childhood Education*, 2004, 213-225.

National School Boards Association. (2007). *Creating and connecting: Research and guidelines on social—and educational—networking*. Retrieved from http://www.nsba.org

Ng, W. & Nicholas, H. (2010). A progressive pedagogy for online learning with high-ability secondary school students: A case study. *Gifted Child Quarterly*, 54 (3), 239-251.

Oliver, K., Kellogg, S., Townsend, T. & Brady, K. (2010). Needs of elementary and middle school teachers developing online courses for a virtual school. *Distance Education*, 31 (1), 55-75.

O'Reilly, T. (2005). *Web 2: Compact definition?* Retrieved from O'Reilly Radar website: http://radar.oreilly.com/archives/2005/10/web_20_compact_definition.html

Palincsar, A.S. (1998). Social constructivist perspectives on teaching and learning. *Annual Review of Psychology*, 49, 345-375.

Pallof, R. & Pratt, K. (2005). *Online learning communities revisited*. Retrieved from http://www.uwex.edu/disted/conference/Resource_library/proceedings/05_1801.pdf

Partnership for 21st Century Skills. (2002). *Learning for the 21st century: A report and mile guide for 21st century skills*. Retrieved from http://www.21stcenturyskills.org/images/stories/otherdocs/p21up_Report.pdf

Patton, M. (2002). *Qualitative evaluation and research methods,* Thousand Oaks, CA: Sage.

Poggio, A. (2011). *Effective online instruction: Best teaching practices to impact student learning*, Research paper presented at ISTE, Philadelphia, PA.

Pope, C. (2010). *A place for us: Teacher created third spaces and affinity places connecting communities of practice*, Unpublished manuscript, Rutgers University.

Richardson, W. (2010). *Blogs, wikis, podcasts, and other powerful web tools for classrooms*. Thousand Oaks, CA: Corwin Press.

Richardson, W. & Mancabelli, R. (2011). *Personal learning networks: Using the power of connections to transform education,* Bloomington, IN: Solution Tree Press.

Rideiut, V., Foehr, H. & Roberts, D. (2010*). Generation M2: Media in the lives of 8- to 18-year-olds.* Retrieved from Kaiser Family Foundation website: http://www.kff.org/entmedia/upload/8010.pdf

Rovai, A. (2002a). Building sense of community at a distance. *International Review of Research in Open and Distance Education.* Retrieved from http://www.irrodl.org/index.php/irrodl/article/viewArticle/79/152

Rovai, A. P. (2002b). Development of an instrument to measure classroom community. Internet and Higher Education, 5(3), 197-211.

Rovai, A. P. (2002c). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *The Internet and Higher Education*, 5(4), 319-332.

Ryan, R. (2007). The effects of web based social networks on student achievement and perception of collaboration at the middle school level, PhD Diss., Touro University, Cypress, CA.

Sadera, W., Robertson, J., Song, L. & Midon, N. (2009).The role of community in online learning success. *Journal of Online Learning and Teaching*. 5(2).

Smith, M. K. (2003, 2009).*Communities of practice, the encyclopedia of informal education*. Retrieved from www.infed.org/biblio/communities_of_practice.htm.

Smith, R., Clark, T. & Blomeyer, T. (2005). A synthesis of new research on K-12 online learning. Retrieved from North Central Regional Educational Laboratory website: http://www.ncrel.org/tech/synthesis/synthesis.pdf

Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication & Information*, 2(1). Retrieved from http://coe.nevada.edu/larchambault/CIG%20790/Lit.%20Review/Building%20On-line%20Community.pdf

Thompson, D. (2010). Beyond the classroom walls: Teachers' and students' perspectives on how online learning can meet the needs of gifted students, *Journal of Advanced Academics*, 21 (4), 662-712.

Tomlinson, C., Kaplan, S., Renzulli, J., Purcell, J., Leppien, J., Burns, D., Strickland, C. & Imbeau, M. (2009). *The parallel curriculum: A design to develop learner potential and*

Challenge advanced learners*,* Thousand Oaks, CA: Corwin Press.

Turvey, K. (2006). Toward deeper learning through creativity within online communities in
primary education, *Computers and Education*, 46, 309-321.University of Minnesota
(2008). *Educational benefits of social networking sites uncovered.* Retrieved from
http://www.sciencedaily.com/releases/2008/06/080620133907.htm

U.S. Department of Education, Office of Planning, Evaluation, and Policy Development.(2009).
*Evaluation of evidence-based practices in on-line learning: A meta-analysis and review
of on-line learning studies.* Retrieved from
http://www.geteducated.com/images/pdfs/doe_online_education_finalreport.pdf

U.S. Department of Education, Office of Educational Technology. (2010). National
Educational Technology Plan. *Transforming American education: Learning powered by
technology*. Retrieved from http://www.ed.gov/technology/netp-2010

Vesely, P, Bloom, L. & Sherlock, J. (2007). *Key elements of building online community:
Comparing faculty and student perceptions*. Retrieved from
http://jolt.merlot.org/vol3no3/vesely.htm

Viadero, D., (1996). Learning in community, *Education Week*, 15 (17), p. 29.

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological
processes.* Cambridge, MA: Harvard University Press.

Walsh, K. (2011). *Social learning with social networking tools designed just for education*.
Retrieved from http://www.emergingedtech.com/2011/04/social-learning-with-social-
networking-tools-designed-just-for-education

Waters, J. (2011). *Competing for the virtual student*. Retrieved from

http://thejournal.com/Articles/2011/07/26/Competing-for-the-Virtual-

Student.aspx?Page=1

Watson, J. (2010). *Keeping pace with online learning*. Retrieved from http://kpk12.com/states

Watson, J. & Gemin, B. (2008). *Promising practices in online learning: Socialization in online*

programs. Retrieved from

http://www.inacol.org/research/promisingpractices/NACOL_PP_Socialization.pdf

Wenger, E. (1998).*Community of Practice: learning, meaning, and identity*. Cambridge, MA:

Cambridge University Press.

Wenger, E. (2006).*Communities of practice. A brief introduction*. Retrieved from

http://www.ewenger.com/theory

Wenger, E., McDermott, R. & Snyder, W. (2002). Cultivating communities of practice: A guide

to managing knowledge - seven principles for cultivating communities of practice.

Retrieved from http://hbswk.hbs.edu/archive/2855.html

Wenger, E., White, N. & Smith, J. (2009). *Digital habitats: Stewarding technologies for*

communities, Portland, OR: CPsquare.

Wicks, Matthew. (2010). *A National Primer on K-12 Online Learning*. Retrieved from

International Association for K-12 Online Learning website:

http://www.inacol.org/research/docs/iNCL_NationalPrimerv22010-web.pdf

Wighting, M. (2006). Effects of computer use on high school students' sense of community.

The Journal of Educational Research, 99 (6), 371-379. Retrieved from

http://www.sagepub.com/drewstudy/articles/Annotated%20Article%2003.pdf

Wise, B. (2011). *The online learning imperative: A solution to three looming crises in education*,

Issue Brief. Retrieved from Alliance for Excellence Education website

http://www.all4ed.org

Young, J., Birtolo, P. & McElman, R, (2009).Virtual success: Transforming education

through online learning. *Learning & Leading with Technology*. 36 (12). Retrieved from

http://www.iste.org/Libraries/Leading_and_Learning_Docs/February_2009_Virtual_Succ

ess.sflb.ashx

Young, S. & Bruce, M. A. (2011). Classroom Community and Student Engagement in Online

Courses. *Learning*, *7*(2), 219-230. Retrieved from

http://jolt.merlot.org/vol7no2/young_0611.htm

Zhang, J., Scardamalia, M., Lamon, M., Messina, R.& Reeve, R. (2007). Socio-cognitive

dynamics of knowledge building in the work of nine-and ten-year-olds. *Educational*

Technology Research and Development, 55(2), 117–145.

Zhao, C. & Kuh, G.D. (2004). Adding value: Learning communities and student engagement.

Research in Higher Education, 45, 115-138.

Zucker, A. (2005). A study of student interaction and collaboration in the virtual high school.

In R. Smith,T. Clark & B. Blomeyer (Eds.). *A synthesis of new research in K-12online*

learning. (pp. 43-45) Naperville, L: Learning Point Associates.

Retrieved from http://hbswk.hbs.edu/archive/2855.html