Response to a Change in Technology by a Community of Practice

Within an Online Learning Environment

by

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> If, as complexity theory would have it, a butterfly flapping its wings can trigger monsoons, then how are we to know which butterflies and which flapping of wings we are to include in the reach of our recognition, and which to exclude?
>
> (Wenger, 1998, xiii)

It is difficult, at the completion of a project that has been impacted by so many people, to limit the list of those to whom formal acknowledgement will be given. Please know, all of you whose wings have allowed me to fly, that my appreciation is heartfelt.

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new directions they offer, and who always gives me his unconditional support.

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Contents

Abstract

The power of communities of practice in responding to change has been recognized by seminal organizational studies (Brown and Duguid, 1991; Cohen and Prusak, 2001; Wenger and Snyder, 2000).

This single case study is an analysis of the experiences of three participants who were part of a community of practice that was embedded within an online learning class. It is written from the point of view of a participant observer. Open-ended interviews focused on the participants' experiences when the interface for online learning that they had become accustomed to through at least four previous online courses was changed, causing confusion and challenges for the group.

The framework for this study consists of the constructs of communities of practice and the objectivist–constructivist learning continuum. The study's context of online learning is also discussed within this framework. Analysis of the interviews offers insights into how individuals within this community of practice learned how to use the new interface. Also documented are their preferences of objectivist and constructivist learning strategies, and the effectiveness of each of these preferences as they were demonstrated in this case.

The insights from this instrumental case study underscore the importance of understanding and supporting learner-interface interactions in constructivist contexts. These insights can be used to inform designers of online learning software, regarding user's needs, as well as organizations that wish to evaluate technological interfaces that are intended to promote community construction of knowledge.

Section One
Placing the Study Within a Framework

Vignette

  I was about to begin my last online course. I felt a bittersweet realization that the experience upon which I had embarked almost two years ago was drawing to a close. Certainly the anticipation of completing my Master of Arts in Communication and Technology (MACT) degree was sweet, but I also knew that the friendships that I had developed within my cohort group of eighteen adult students would soon no longer be enriched by the many online discussions in which we engaged and the extra-curricular social gatherings that we enjoyed. Now, several of my classmates were in the process of completing their final thesis projects – an intense and lonely venture. Others still had a final elective course to complete before embarking on the thesis project, as did I. Most who lived out of province had already returned to distant lands that they called home, relying on cyberspace to keep in touch. I didn't want this feeling of community to end, but understood how the inevitable forward movement of time was much like a juggernaut.

  The elective course I was facing was not a core course attended only by my MACT cohort. Core courses were rich with the communications between individuals who had come to know each other's online 'voices' and how these voices reflected the backgrounds, histories, and personalities of their individual owners. An elective course might have a few of the cohort in its enrollment, but would also likely involve several other students. I wasn't sure what to expect.

  Of the two elective courses I had already completed, one saw five of 'us' living together for a week at a cohort member's home in Calgary. For one very intensive week,

we attended classes together, traveled together, ate together, completed assignments together, and although we tried to mix with some of the 'others' in the course, we often found ourselves partnering up on projects and assignments because we knew each other so well. Giddy with night – long work sessions that left us severely sleep deprived, we built memories. Aside from shoulder-to-shoulder online searches, and sharing of 'finds', we took pleasure a variety of ethnic suppers, and enjoyed smooth jazz background music. With a smile, we renamed ourselves 'the Calgary Subset', and we have continued to meet as such long after the completion of that course.

In another elective course, I felt incredibly alone among others who showed no sense of community in their online presence. My efforts at establishing discussions in a style similar to what I had experienced with the MACT program were shut out, and I soon learned that postings were expected to be just answers to questions, with no community building of ideas, and no instructor presence. I missed building knowledge through the group's insights, which made things so meaningful for me. The students in that course were all Education students, something that should reasonably have evolved into a community, considering their common experiences and backgrounds. In contrast, the MACT community involved people from a variety of business backgrounds as well as educators, nurses, and a law enforcement officer. Through our common goal, the completion of the MACT program, the bonds within this group strengthened over time, and the many perspectives that were expressed in our online discussions served to enrich the courses we shared.

I faced my final elective, wondering if this new online course, User Centered Design (UCD), would resemble the Calgary experience, the lonely experience, or a

totally new experience. With this frame of mind, I entered the familiar WebCT™ interface that I had depended upon to deliver past courses, but I was surprised by some significant changes. Although a few aspects of the interface were familiar, many features of this portal had changed, often in confusing ways.

After a brief period of exploring the site and how it was organized, I discovered, to my delight, that eight of the fifteen students for this course were from my MACT cohort. I instantly felt 'safe' knowing that I had my community to consult if things became too confusing; however, online messages, private email, and telephone conversations soon buzzed with expressions of frustration with our new course interface, which went by the title Vista™.

What happened next was interesting. The eight MACT class members supported each other by sharing navigational hints, reformatting documents to make them more accessible to people whose computer systems would not read attachments that were posted, and providing moral support that kept people going, one of whom was on the verge of quitting the course. We were a community.

As I considered the situation at greater length, I thought about how I might approach it in a study. I identified two theoretical constructs that were interwoven here: community of practice, and the constructivist - objectivist learning continuum. The construct of community of practice would offer the framework with which to examine the dynamics of the MACT cohort's learning behaviour, and the constructivist – objectivist learning continuum would become a tool that would allow me to identify the types of learning strategies that were chosen by the participants.

Because I was an insider in this group, I had a sense that we were a community of practice, but I needed to establish exactly what it was about us that made us such a community. I also needed to understand what set us apart from the community made up of the entire class for the UCD course. We appeared to be one type of community within a class group that was another type of community, and I was curious about the dynamics of that situation.

I hoped that a clearer picture of how a community of practice functioned would emerge by taking a closer look at the interaction within my cohort group while they were learning how to use the new Vista™ interface. The epistemic theories represented by the constructivist - objectivist learning continuum dealt not only with the location of the real world which was represented by knowledge, but also with the joint or individual construction of knowledge. Where would this community of practice's responses fall on this continuum? Would their choices in learning strategies be constructivist or objectivist? How did individual learning enrich the group's learning, and how did the group's learning enrich individuals' experiences? Also, some of the issues with Vista™ were referred to the group, while others were dealt with individually. What was it about these issues that prompted these different approaches?

Because both the functioning of learning communities and the choices of constructivist or objectivist learning strategies took place in an online context in this study, it also became important to understand the history, purpose, and development of online instructional design.

From the nature of the questions that initiated this inquiry, and my personal involvement, a qualitative, instrumental case study from the perspective of a participant

observer seemed appropriate. The choice of case study also seemed fitting in light of

Merriam's (1998) description of a qualitative case study as "an intensive, holistic

description and analysis of a single instance, phenomenon, or social unit" (p. 27). Further

reference to Cresswell (1998), Guba and Lincoln (1994), Neuman (2003), Stake (1994) and

Yin (1989) convinced me of the suitability of this approach. Interviews of participants in

this social unit, experiencing this single instance, would provide rich insights for this study.
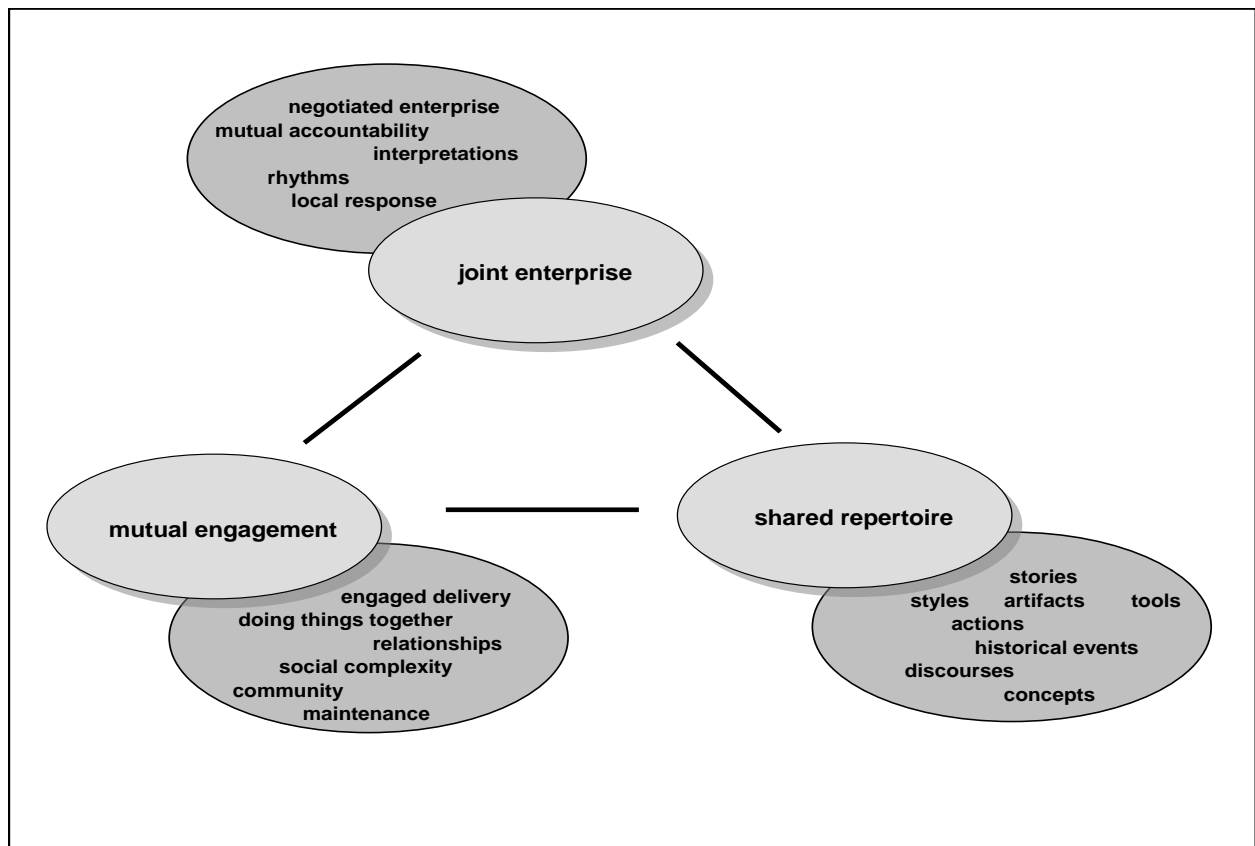
Communities of Practice

The phrase *community of practice* was originally coined by Lave and Wenger

(1991). Although the authors acknowledged that such communities have been around for

centuries, their awareness of the workings of a community of practice began within the

context of apprenticeship models of learning. The writings of Lave and Wenger (1991),

Wenger (1998, 1999), and Wenger and Snyder (2000) and Wright (2001) continue to

explore the workings of these communities of practice.

Wenger and Snyder (2000) emphasized that the nature of communities of practice

is informal. They "set their own agendas and establish their own leadership (and)

membership in a community is self-selected" (p. 142). Wright (2001) further described

the diversity of forms that a community of practice might take. "Due to their emergent

and fluid nature many different iterations of communities can be identified" (p. 1). With

all of these possibilities for variation, how can the study of such communities be

accomplished?

Wenger (1998) created a model of the three major components of a community of

practice: mutual engagement, joint enterprise, and shared repertoire (see Figure 1). These

components make a community of practice a powerful learning system that is highly

responsive to change (Brown and Duguid, 1991). I will be using these three components

to provide the framework that will help me to determine whether the portion of the

MACT 2000 cohort that took part in the UCD course, was a community of practice. I

will also use these three components to help me identify the differences between this

subset of the MACT 2000 cohort and the total UCD class in terms of how each

functioned as a group.

**Figure 1. Model of the interactive components of a community of practice
(Wenger, 1998, p. 73)**

Joint enterprise is a community's current, understood, focus of learning, which

changes as it is renegotiated by its members. This focus relates, in some way, to the

'practice' of the community, and it demonstrates the complexity of the community's

interrelationships. An unexpected, difficult situation may cause a community of practice to respond by identifying its needs and negotiating a response to the situation. The goal of managing the difficulty is understood by the group, and the mutual accountability in this pursuit becomes the practice of the community (Wenger, 1998).

Mutual engagement is what "binds members together in a social entity" (Wright, 2001, p. 2). The sense of belonging felt by members of a community of practice comes from a subtle coherence that evolves as members learn to trust each other. Over time, as they work together, they begin to understand who the other people in the group are, and what their values and contributions to the group can be. A sense of loyalty to the group develops. Because it is often through tension and difficulties that people understand how and when they can depend on each other, mutual engagement also reflects knowledge that members have of others' limitations as well as their strengths (Wenger, 1998).

A shared repertoire includes the concepts, stories, artifacts, and tools that all members understand and use as needed. A shared repertoire is developed over a period of time, and results in a single word or symbol used by one member of the community representing an entire complex unit of meaning for the whole group (Wright, 2001).

Wright (2001) described a learning community of practice as one that is supportive of its learners as they assume progressively complex tasks. The interaction within this community engages all participants as learners, through their observations and exchanges of ideas. This leads to "knowledge creation and transfer as well as exposure to the culture and social norms of the community" (Wright, 2001, p. 4).

The power in a community of practice comes from its ability to create, transfer and share knowledge; however, Wright (2001) cautions that the very nature of these

communities may cause them to become "inwardly focused, insular and closed to new ideas" (p. 7). Wenger (1999) offers a chilling reminder of the negative power some communities of practice have wielded. The witch hunts of years ago, organized crime, terrorist groups, and white supremacist groups are but a few examples. Although these negative groups share information and values within their practice, their dependence on outside sources is limited to whatever supports these values and practices, and they do not tolerate challenges or efforts at paradigm shifts. Wenger summarizes this fatal flaw when he states that communities of practice "are born of learning, but they can also learn not to learn" (Wenger, 1999, p. 5). It follows that the cause of such insular, closed communities of practice is their failure to grow because they do not learn from what is 'outside'. Essential outside sources can be provided when individuals within a community are also members of several other communities. Such networking provides new knowledge that can question the status quo and lead to growth. These interactions with out-of-community networks, referred to as boundary spanning activities, allow essential, new ideas to enter a community of practice (Wenger, 1998, 1999).

The value of productive communities of practice has come to the attention of knowledge management specialists (Cohen and Prusak, 2001; Stewart, 2001; and Senge, 1999). Along with this awareness comes a tendency to want to manage these communities; however, since a community of practice involves voluntary participation and membership, trying to manage one is much like trying to manage a child's friendships. For this reason, there is an increasing focus on how to nurture rather than manage these groups. Ultimately, nurturing activities reflect back on the three components of Wenger's (1998) model (see Figure 1).

Mutual engagement is one of the requirements of membership in a community of practice. Although face-to-face interaction is a preferred means of engagement, accessible, reliable, and flexible technological mediation can also allow for this engagement. Ensuring the availability of several modes of communication such as discussion boards, email, chat and telephone, would aid these communities. Ideally, communication modes embedded with choices that include access to a variety of sensory interaction should be available in order to create virtual face-to-face encounters (Aragon, 2003).

The adaptive nature of leadership within a community of practice affects the joint enterprise and mutual engagement components of Wenger's (1998) model. The form of leadership varies, not only between groups but, over time, within a group as well. It evolves internally, within a community of practice, and cannot be applied from outside. A leader may emerge who is passionate and energetic, or a community may not even have a single, identifiable leader. When leadership is related to 'competence', which Wenger (1999) defines as the knowledge contained within a community of practice, there will be times when individuals are taught 'competence' by leaders within the community, and other times when individuals use their knowledge and experience to enrich the community's competence. In an established community of practice, long-term members may cycle in and out of peripheral participation as they either offer leadership with the expertise their group requires, or take advantage of other members' knowledge and skills in order to augment their own (Brown and Duguid, 2000). As the needs of the community change, so the leadership changes. Other roles that various leaders may assume at some time include, but are not limited to: community coordinator, thought

leader, networker, documenter, pioneer, etc. (Wenger, 1999). Since leadership comes from within a community of practice, it must be nurtured from within. In individual may be able to act as a leader within a group, if the group acknowledges that this person understands the joint enterprise, is mutually engaged and is accepted enough to share in the repertoire of the group (Wenger, 1998).

The presence of social capital also relates to the mutual engagement component of Wenger's (1998) model. Social capital is defined by Cohen and Prusak (2001) as consisting of "the stock of active connections among people: the trust, mutual understanding, and shared values and behaviors that bind the members of human networks and communities and make cooperative action possible" (p. 4). These authors state that organizations can nurture social capital by "giving people space and time to connect, demonstrating trust, effectively communicating aims and beliefs, and offering equitable opportunities and rewards that invite genuine participation, not mere presence" (Cohen and Prusak, 2001, pg. 4).

Connectivity occurs at the boundaries of a community of practice. Unlike the more rigid boundaries normally found in many clubs or organizations, those of a community of practice are described as *fluid* (Wenger, 1999). It is a shared practice that incorporates its own language, tools, stories, symbols, etc. that determine who *belongs* and who is *outside*. Participants on the periphery, may simply act as observers and may eventually gain enough competence in the shared practice that they are integrated into the community of practice, which, in turn, gains from the outside knowledge brought into the group in this way. Unfortunately, because the sense of boundary in a community of practice is not widely understood as being permeable, members of an organization may

assume a visible community to be a closed unit, which might create divisions within the organization and may become a source of fragmentation or misunderstanding.

As a community of practice evolves, its members develop a sense of trust and connectedness that is represented by Wenger's (1998) model. The shared repertoire component of this model is tied to the community's identity, which "involves deep connections with others through shared histories and experiences, reciprocity, affection, and mutual commitments" (Wenger, 1999, p. 14). Membership in a community of practice involves attitudes different from those that have been historically acceptable in the functioning of business and in our classrooms. Competition, which isolates achievers, gives way to collaboration. "You don't simply compete: in fact, your most threatening competitor may be your best partner when it comes to learning together. If you hoard your knowledge in a social learning system, you quickly appear as taking more than you give, and you will progressively be excluded from the most significant exchanges" (Wenger, 1999, p.18).

With this understanding of what makes up a community of practice, it can now be compared to the community represented by the total enrolment in the UCD course. In this study I will be referring to this group as a community of learners. This application is consistent with the use of this term in relevant literature (Brown, 2001; Conrad, 2002a, 2002b; Gabriel, 2004; Garrison & Archer, 2000; Jonassen, 1992). Although some of the descriptors of a community of practice do apply to the entire group of students taking the UCD course, specific, important aspects of such a community are also missing.

In regard to the component of joint enterprise, the total UCD community of learners did not set their own agendas in this learning experience; the instructor outlined

the goals and aims of the course for the participants, and a time frame in which these had to be achieved was evident. Although students came to the discussion board with postings that contributed to a joint enterprise, this joint enterprise was not "continually renegotiated" (Wright, 2001). In terms of shared repertoire, there was insufficient time to develop routines, shared sensibilities, artifacts, language, styles and shared stories. This aspect of a community of practice was either missing, or in the very early stages of development. The limited time during which this community of learners came together also restricted the development of a sense of trust between all class members. The result is that mutually beneficial relationships would not have had sufficient time to support the deeper levels of mutual engagement apparent in communities of practice (Wright, 2001). An attempt was made to generate background information for participants at the opening of the course when they were invited to introduce themselves online; however, brief self-descriptions, unaccompanied by voice or image were likely not as effective as background information that is usually generated from long-term, face-to-face exchanges combined with informal, social gatherings. It takes time to allow an online community to evolve (Brown, 2001; Conrad 2002a; 2002b), and the short, three month duration of the course did not allow enough time for the UCD community of learners to develop to the extent that the community of practice had.

The MACT group within the UCD class, however, had the advantage of a shared repertoire, a history together, gathered through almost two and a half years of working together in coursework, attending social functions together, and knowing each other's faces, voices, backgrounds and personalities. Their sense of joint enterprise and mutual engagement came from being in the cohort that had already completed most of its

program, which meant that most students had at some point worked with every other student in the program at least once. They could recognize what learning was needed, and had the power to initiate and negotiate that learning, as can be seen in their response to Vista™. A closer look at participants' responses in the interviews conducted for this study provided further evidence of the existence of a community of practice, and this is detailed in the discussion of the findings in this paper. Thus, the MACT subset involved in the UCD course was a community of practice, and it could be seen as a community of practice within a community of learners.

The Constructive – Objective Continuum

When the MACT subset interacted with Vista™, they were involved in an act of learning about this interface. It is helpful to have a clear understanding of the constructive-objective continuum in order to identify the position that their chosen learning strategies take on this continuum. Knowledge about the continuum also contributes to understanding the online learning context in which this study is situated.

Constructivism and objectivism are epistemological constructs that consider the location of *reality* in respect to learning or understanding. According to constructivism, reality exists in the mind of the knower and is the product of that person's understanding of her/his experiences. On a continuum, the opposite extreme of constructivism is objectivism, which is a belief that reality exists external to the knower. According to objectivism, the world is real, structured, and can be modeled for the learner (Jonassen, 1993). Because these are extremes, most theorists find that their beliefs fall somewhere along this continuum, rather than at either end (see Figure 2). An understanding of these

epistemological constructs is clearer when we look at their roles in the context of online learning studies.

Constructivism Objectivism

Figure 2: The constructivist – objectivist continuum.

Jonassen (1993) used a reference to instructional systems technology (IST) to explain that it is based on assumptions that efficient learning can be designed when concepts are analyzed, broken down into parts, and simplified in order to deliver learning tasks suitable for a specific learner. Jonassen then went on to challenge this system when he suggested that a paradigm shift from objectivism to constructivism was required for (IST). He stated that the learning concept being 'designed' in IST is likely misrepresented due to being stripped down, simplified, and decontextualized. He went on to say that this system also "assumes that (1) we all agree on what reality is, and (2) we all use essentially the same process for understanding it" (Jonassen, 1993, p. 3). IST assumptions are based on objectivism, a belief in a real world independent from an individual's mental constructs of that world. Because this world is *real*, it can be structured and modeled in a learning design. "Learners are told about the world and are expected to replicate its content and structure in their thinking" (Jonassen, 1993, p. 5). On the other hand, constructivism doesn't deny that an external reality exists; it claims that an individual's understanding of an external reality is subject to that person's prior experiences, values and beliefs. Reality is an individual's negotiation of a new

experience (or learning) with previous experiences (or learning) within that person's mind.

Jonassen (1993) used support from Piaget (1970) and Bruner (1986, 1990) to argue against the existence of an objective reality when he stated:

> If our learning theory assumes that we construct meaning for objects and events by interpreting our perceptions of them in terms of our past experiences, beliefs, and biases, then each of us mentally represents our own personal reality. Each reality is somewhat different, because each person's experiences and resulting apperceptions are different. These differences in interpretation are proof, ipso facto, of the individual, constructed nature of reality. (p. 3)

Because previous experiences play a significant role in constructivist learning theory, providing a context for the learning concept gains importance. A relevant context for a new concept is more likely to establish the link to previous experiences than would a concept stripped of context. Additionally, multiple perspectives on a concept would also benefit a learner because such a diversity of perspectives would more likely access previous experiences than would a single perspective.

Vrasidas (2000) indicated that the two principle views on constructivism are personal constructivism and sociocultural constructivism. The difference between these two paradigms has to do with the location of the learning. Personal constructivism considers that knowledge is constructed in the mind of the learner; sociocultural constructivism contends that knowledge construction occurs in a social context, through the interaction of a group or community of learners. Vrasidas went on to name

communities of practice as the locus of knowledge construction for sociocultural constructivism, however she found it difficult to isolate personal from sociocultural constructivism. Vrasidas blended the two views because she believed that they complement each other. She felt that individual knowledge construction required enculturation into related practices within society. "Unless the socially constructed knowledge is being processed in the individual's mind and related to her experiences, it will not be meaningful" (Vrasidas, 2000, p. 352).

The role of goals or objectives becomes important in this study, not only in their apparent contradiction of constructivist learning theory, but also because of their position in the functioning of communities of practice, which has already been established as emerging from the group itself. The following insights regarding the role of goals in online learning as a conflict within constructivist pedagogy will help to make sense of that context.

Most formal learning involves goals because our educational institutions are based on Samuel Taylor's scientific management system, and later, Bobbitt and Tyler's business-like accountability measures that evolved into today's standardized testing and comparisons (Vrasidas, 2000). This begs the question; can the goals of learning be objective in nature while the pedagogy is constructivist in nature? Cole (1992) explored this question:

Are we actually facing a dichotomy – either to present a detailed list of

goals/objectives or to present none? Why is it not possible to provide

goals to *orient* the learner, while at the same time encouraging the learner

to identify and pursue personal goals? In fact, if constructivist learning

should engage the learner in authentic tasks and be context driven (e.g. Jonassen, 1991), how is it possible to engage the learner in goal-free learning? Authentic tasks that are situated in a given context entail very precise goals. Does constructivism, then, preclude goal-oriented evaluations? I don't believe so. Just as constructivism argues for multiple evaluators (Cunningham, May 1991; Jonassen, 1991), it should, I believe, argue for more than one type of evaluation – goal-driven as well as goal-free. (p. 6)

With one foot placed firmly within constructivist theory, and the other set just as firmly in objectivism, Cole (1992) appears to have found a compromise that would satisfy the qualitative ideals of constructivist learning as well as the requirements of a world of formal learning that relies on, and demands, quantitative evidence. That world is the setting of online learning that makes up the context of this study.

Distance Education, Online Learning

A brief look at the purpose and development of distance education and online learning further clarifies the context of this study.

Long before the accessibility of information and communication technologies, distance education consisted of lessons that were mailed to a student to complete in isolation. Once a lesson was completed, it was mailed back to a marking centre where it would be evaluated, commented upon and mailed back to the student. Although problems might have been discussed via telephone, the cost of telephone communication, often involving long distance charges, made these calls an infrequent intervention. More frequently, the student might communicate questions to his/her marker via the next

package of lessons. The time lapse between learning, feedback, questions and answers could be considerable. As an alternative to a bricks-and-mortar type of learning environment, this delivery was noticeably lacking in a sense of community for the learner and in immediacy of feedback, and it demonstrated an objectivist mindset rather than one based on constructivism (Garrison, 1993; McLoughlin, 2000).

Skipping forward through ensuing years, electronic learning evolved, and it attempted to ameliorate the isolation of learners through the development of virtual communities of online learners. In their study on support services for distance education graduate students, Cain, Marrara, Pitre and Armour (2003) described today's distance education as "education or training delivered to remote (off-campus) location(s) via print, audio, video (live or prerecorded), and / or computer technologies, including both synchronous and asynchronous instruction" (p. 42).

Successful online learning experiences reflect constructivist learning theory through the involvement of students in discussion and project building, both of which would require online negotiation (Jonassen, 1992; Jonassen, 2000; McLoughlin, 2000). Garrison and Archer's (2000) model of distance education involves cognitive, teaching and social presence (see Figure 3). Cognitive presence, or learner-content interaction, refers to the process an individual learner goes through in building knowledge. Teaching presence, or learner-instructor interaction, refers to more than an instructor's role; it can also involve either assigned or voluntary student ownership in the teaching process. Social presence, or learner-learner interaction, involves the opportunity for learners to contribute to a community of learners – such as the student group in an online course (Moore, 1998; Garrison and Archer, 2000).
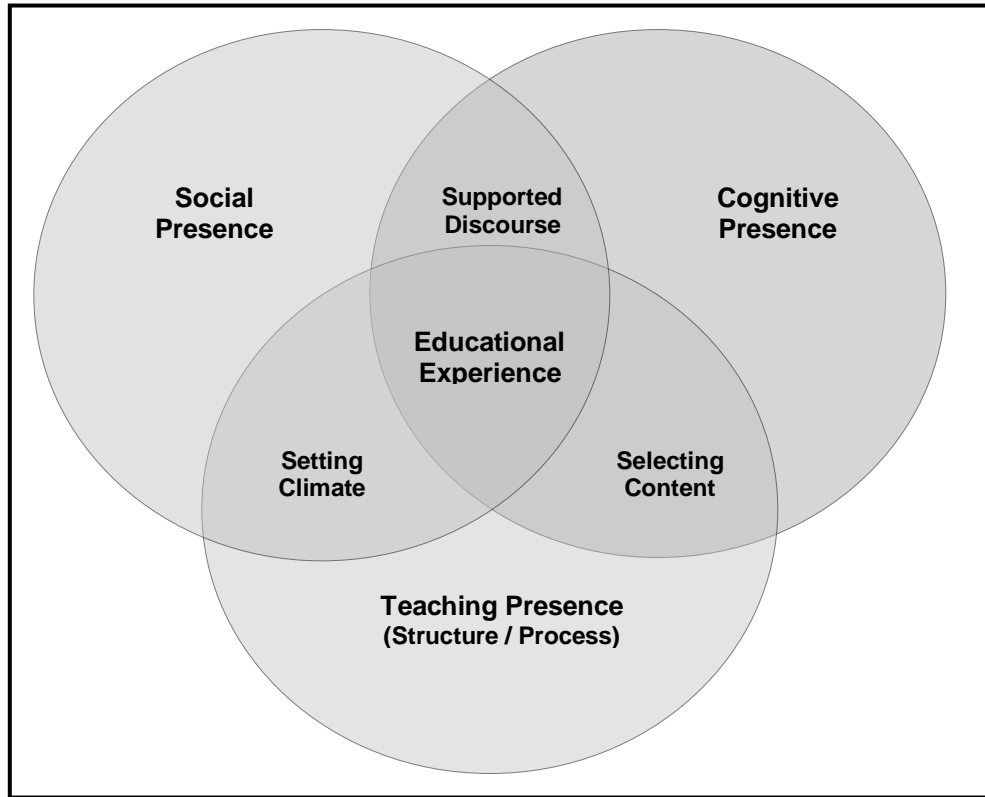
**Figure 3: Garrison, Anderson, and Archer's Model of Community of Inquiry
(Rourke, Anderson, Garrison, and Archer, 2001)**

Vrasidas (2000) references work by Hillman, Willis, and Gunawardena (1994)

indicating that since distance education also involves technology as a medium, a fourth

interaction, that of learner – interface, should be acknowledged. It addresses an online

learner's interaction with the medium through which that learner accesses the course.

"The message conveyed by a medium is colored by the medium's attributes. Therefore,

the learner's skills in using technology to communicate will influence success in distance

education" (Vrasidas, 2000, p. 342). Logan (2000), McLuhan (1967) and Burch (2000)

examine, at length, the range of influence that a medium can exert. In Figure 4 I have

shown learner-interface interaction as a lens through which an online learner accesses

Garrison et al.'s Community of Inquiry.
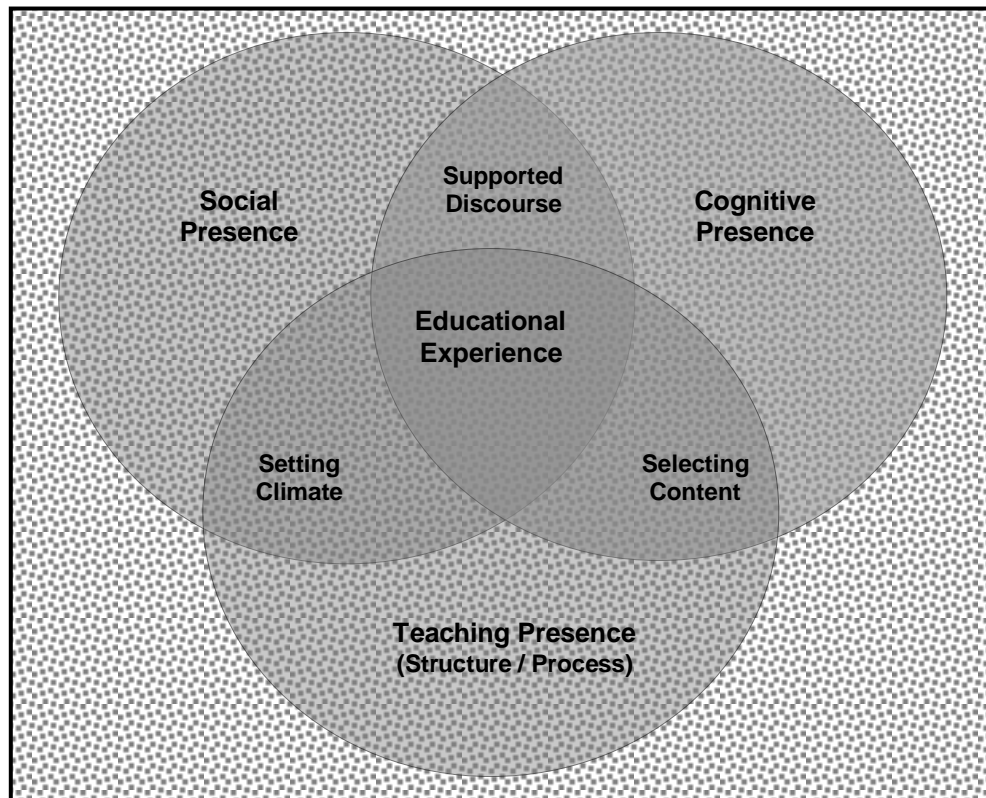
Figure 4: Learner-interface interaction as a lens through which an online learner accesses Garrison et al.'s Community of Inquiry

Garrison and Archer (2000) identified the expression of emotion, honest

communication, and a sense of group membership as contributing attributes of social

presence. These attributes remind us of the strengths cited in Wenger's (1998)

communities of practice. Similarities between communities of practice (Wenger &

Snyder, 2000; Wenger, 1998; Wright, 2001) and communities of learning (Jonassen,

1992; Garrison & Archer, 2000), and their subtle differences have already been

discussed.

In a cohort model of online learning, a group of students would, over time, move through a series of courses together, thus strengthening that group's online cognitive, teaching and social skills as well as giving them a common set of knowledge or 'competence'. The long-term association of such a group strengthens the likelihood that a community of practice will evolve. If, as in this case study, members of a cohort group also have an opportunity to meet face-to-face through both classroom and social activities, the building of a trust relationship is supported and coherence as a group is further facilitated. "Many organizations find that people must meet in person to begin to cohere into a group and then have periodic meetings to reconnect and recalibrate their shared understanding and commitment. In these cases, electronic communication and face-to-face meetings support each other" (Cohen and Prusak, 2001, p. 175). The MACT cohort group benefited from this type of facilitation.

The MACT program consisted of a series of seven core courses through which students, as a cohort group, progressed over a period of two years. Three of these courses were conducted in face-to-face environments, one course was a combination of face-to-face and online delivery, and another three courses were completed purely online. The face-to-face components were spread over two sessions that occurred a year apart. During these face-to-face sessions, the course instructors included group and pair work, and the program designers built in introductory and concluding social events. These experiences likely prompted the other social activities that were later initiated and organized independently by the cohort group. The total design of the program allowed students to build a common set of knowledge, or competence, as well as begin to build trust relationships that evolved further on their own.

Another aspect of online education is the relative immediacy of feedback and interaction available with today's technology, which can both facilitate and complicate the online experience. The perceived advantage of asynchronous learning is that it allows students to work on their online courses anywhere, anytime. With this type of freedom, participants in online courses often enter their programs with expectations of how much time they can devote to coursework. When these expectations are frustrated by technological glitches that take time to overcome, or when different students have different quantities of time available to work online, difficulties arise. In Conrad's (2002a) dissertation, she determined that online learners often set aside a period of time for their coursework, and that the time used to solve technical difficulties, in these learner's perceptions, used up some of this time allotment. Additionally, some students set aside one particular time of the week for their involvement, and they found that others, who had more time as well as flexible time, may have visited the learning site frequently, leaving several messages that required more feedback than the expected time allotment could accommodate. The fact that individuals varied in how much time they were able or willing to give to online learning caused some friction in the sense of community required by online learners. Specific messages also occasionally caused difficulties due to individual perceptions of what it meant to be polite, friendly, concise, appropriate in content, and in length, etc. (Conrad, 2002a). Thus the immediacy offered by present-day, technologically delivered, online courses is a double-edged sword. Although it is advantageous to support constructivist learning with immediate feedback, the volume and type of messages that this immediacy facilitates could become problematic for some learners.

The choice of software in the delivery of distance learning also influences the success of this model. Ideal software should allow the type of constructivist activities mentioned above to take place: cognitive presence, student as well as instructor teaching presence and social presence (Garrison and Archer, 2000). It should also provide a functional means for a community of practice or community of learners to interact (Jonassen, 1992; Jonassen 2000; Wenger, 1998). Vrasidas (2000) echoed this and used references to Bruner (1996), Jonassen (1992) and Vygotsky (1978) to support her statement, "The use of technology and other cultural tools to communicate, exchange information, and construct knowledge is fundamental in constructivism" (p. 358). McLoughlin (2000) described specific features that accommodate these needs. Her list includes, "Synchronous and asynchronous communications systems (for example, bulletin board, chat, e-mail). Image and resource archives application sharing (for example, video and audio streaming). Student self-monitoring tools (for example access to progress reports). Self-evaluation tools (for example, online quizzes and tests). (and) Student presentation areas (for example, areas where students can display their work)" (McLoughin, 2000, p. 117).

Additionally, designers of this software should be cognizant of the time limits that many online learners work with, and it should follow principles of user-centered design to ensure that time truly is used for online learning rather than spent figuring out a new version of the technology (Campbell, 2004; Conrad, 2002a; Vredenburg, Isensee, & Righi, 2002).

Purpose of the Study

The purpose of this research was to gain insight into learning by adults, who were part of a community of practice situated within a larger community of learning, as they responded to an innovation that upset previously developed expectations of the interface they had used to access online courses. To this end, questions lead participants to focus on their reactions and the strategies they used in managing frustrations or difficulties as they interacted with the new interface. Reactions of interest were those that offered insights into the workings of the community of practice and those that indicated their choices regarding learning strategies.

Research Question

The study would be used to answer the question: How did a community of practice that was engaged in an online learning experience respond to a technological change?

The first two sub-questions centered on the functioning of a community of practice regarding this change:

- What aspects of the functioning of communities of practice were demonstrated in this situation?
- Which of the difficulties encountered influenced members of the community of practice to look to their group for help, and what types of difficulties did individuals deal with on their own?

The second set of questions related to the choices of constructivist/objectivist learning strategies that were demonstrated in this situation:

- What preferences for constructivist or objectivist learning strategies did individuals in the community of practice demonstrate?

- What was the nature of difficulties that were solved, and what types of difficulties were not solved during the time of this study?

Significance

Constructivist learning is essential not only in education, but also within the business world. When Senge (1999) talked about the necessity of making organizational quality circles effective through developing team learning skills, he elaborated, "Ultimately, the learning that matters is the learning of groups of people who need one another to act…" (p. 4). He also emphasized that learning was demonstrated in an active group process that constructed meaning; it is not demonstrated when reflexive, memorized answers are supplied to questions posed by authority figures. Regarding pedagogy, he suggested that if communities of learners were fostered by the school systems, students would become life-long learners who are essential in developing learning organizations - organizations that would have the flexibility to react appropriately to the steady developments of innovations. Senge reflected on the fundamental views on learning suggested by Dewey (1897), which are represented in the following quote:

I believe that the only true education comes through the stimulation of the child's powers by the demands of the social situations in which he finds himself.

Through these demands he is stimulated to act as a member of a unit, to emerge

from his original narrowness of action and feeling, and to conceive of himself

from the standpoint of the welfare of the group to which he belongs.

(Dewey, 1897, p. 77)

Also within the business world, knowledge and knowledge management have

become the currencies of today's economy. In his book, *The Wealth of Knowledge;*

Intellectual Capital and the Twenty-first Century Organization, Stewart (2001) argues

that knowledge has become "the most important factor of production in the modern

economy – our most vital raw material, asset, and output" (p. xiii). In his list of

"symptoms" that indicate that a business has failed to consider knowledge management

in their business strategies, Stewart includes the condition that "good ideas don't transfer

between departments, units, countries, etc. Knowledge sharing – or its failure – may be

the single most common knowledge problem, underlying many on this list" (p. 223).

Cohen and Prusak (2001) join Stewart in underscoring the importance of trust in

knowledge sharing. They state that communities of practice are not only powerful in

demonstrating trust, they also provide effective structures for learning and problem-

solving. They also state that trust depends on communication. For that reason, "in the

twenty-first century, companies will need connectivity – emotional and intellectual

connections as well as electronic" (Stewart, 2001, p. 335).

We can see the power of communities of practice in creating and sharing

knowledge. If we consider that online communication can complement the functions of

these communities and will allow them to function regardless of restrictions of time or

place, we can begin to understand the significance of being consciously aware of the participant-interface interaction that may affect this communication.

The significance of this inquiry for me, personally, relates to my life work as a classroom teacher. I have taught language arts at a junior high level for over twenty-five years, and the heuristic construction of knowledge has been my aim through these years. With increased emphasis on the use of information and communication technologies in our schools, the context of this case study could conceivably exist in the delivery of today's or future education. Outcome 5 in the *Program of Studies for English Language Arts K-9* (Alberta Education, 2000) states, "Students will listen, speak, read, write, view and represent to respect, support and collaborate with others…. Students learn collaboration skills by discussing in groups, by building on others' ideas, and by planning and working together to meet common goals and strengthen community. In every classroom, students develop a sense of community" (p.89). The *Program of Studies for Information and Communication Technology K-12* (Alberta Education, 2004), a curriculum Alberta teachers are required to integrate into their practice, states, "Students will use technology to aid collaboration during inquiry" (General outcome C-5). Additionally, it is a teacher's job to deliver lessons that are differentiated for individual learning styles. The insights of this study could therefore be significant when designing differentiated learning experiences. For example, enrichment modules could be designed for groups of exceptional students that could easily evolve into communities of learners. Through technology, these groups could communicate with similar groups in other schools, districts, provinces, or even other countries (Logan, 2000). Awareness about the effects, both positive and negative, of technological innovations and learner interfaces on

such learning communities, as well as awareness of the impact of pedagogical choices in the design of learning experiences could empower teachers to be more effective facilitators. Whether the group is an enrichment group, or a group constructing any other type of knowledge within an online environment, which is an environment that does not always behave predictably, the awareness of the processes involved would facilitate planning, design and implementation of effective learning experiences.

Students are not the only ones within our school systems who might benefit from these insights. Teachers, who have traditionally worked in relative isolation, could benefit from community building that might be facilitated by information and communication technologies (Logan, 2000). As Brown and Duguid (1991) examined the power of communities of practice in business organizations, they encountered a disconnect between the actual work being done by employees and mangers' understanding of that work. This disconnect exacerbated the difficulties of applying procedures or training mandated by the managers. The creativity of employees as they improvised in order to meet expectations and do the complex work required of them was often a community effort. The value of such communities of practice is demonstrated in their ability, as a group, to continuously learn and make sense of ambiguous, complex demands. It is my opinion that teaching is an example of a disconnect between the actual work being done and the understanding of that work by the authorities that mandate changes. It therefore becomes essential to pool teachers' creativity and competence, and to understand and nurture communities of practice that continuously learn and make sense of ambiguous, complex demands.

In Alberta classrooms, teachers must be able to access at least one computer that is connected to the Internet. As suggested by Logan (2000), access to the intranet for a school district can be used as a tool to connect teachers. This technology has enormous potential to facilitate important communication and sharing within teachers' communities of learning, and encourage them to evolve into communities of practice. Again, it would be beneficial to understand the structure and workings of such communities in order to be able to nurture them and to gain insights into the management of technological innovations that might facilitate them.

Section Two
Review of Relevant Research

In my search for research relative to this study, I focused on finding inquiries that either directly or indirectly shed light on the three main elements that I identified as interwoven in this case study: communities of practice, choices regarding constructive or objective design in online programs, and learner – interface interaction, specifically in an online learning context. These are all fast-growing areas of knowledge, however some research has been published that offers insight into aspects of these processes. As much as possible, I attempted to select studies that would add to the framework concepts detailed in the previous section of this study, and would offer insights that will later help in the interpretation of the results of my research.

Communities of Practice and Online Learning

What would research literature tell me about the evolutionary process of a community of practice in an online context? It appeared to me that my differentiation between a community of practice and a community of learners pointed to the possibility that an evolutionary process might exist.

Brown (2001) identified a three-stage phenomenon in the process of community building in her study of online learners. In stage one, *online acquaintances*, she described a comfort level in communicating with, and gravitation towards, individuals with whom participants felt similarities. Stage two, *community acceptance*, was indicated by a sense of membership and kinship with others in the group, often resulting from a satisfaction in participants' own contributions. Stage three, *camaraderie*, was achieved with long-term personal connections and communication through many classes.

The third stage often involved face-to-face or secondary communication, and the description of a stage three community closely resembles the description of a community of practice. The significance of gaining this sense of evolution that culminates in stage three was that it was now possible to support the differentiation between a community of practice and a community of learners and to place them on this type of evolutionary scale.

It is interesting that Brown's (2001) study was of online courses, yet face-to-face was established as such an important feature of the stage three community. In online learning, face-to-face is often not available. Can a stage three community, or a community of practice, exist without a face-to-face component?

A study by Gray (2004) indicated that this was achieved. Gray focused her study on her own experiences as a moderator for an online forum designed to support informal workplace learning. In her interpretive, qualitative inquiry, Gray reflected Lave and Wenger's (1999) work in the manner in which she described her forum group. "It is in these communities of practice that people learn the intricacies of their job, explore the meaning of their work, construct an image of the organization, and develop a sense of professional self" (p. 23). In the description of her role as a moderator, Gray included the functions of maintaining the group process and nurturing social aspects of the community. This reflected what Wenger (1999) described as nurturing a community of practice through support that focused on developing the three components of joint enterprise, mutual engagement, and shared repertoire. Gray listed the strategies that she employed in order to accomplish this. She encouraged participation by sending emails privately to thank students for insightful postings, by inviting participants to comment on issues, or by asking some participants to challenge some stances developed by the group.

On occasion, she also played the role of devil's advocate. Gray also started social discussion threads unrelated to work, initiated live chats, and encouraged participation by lurkers through conducting regular polls and offering the possibility of anonymous participation. She allowed others to take the lead in discussions whenever possible by ensuring that ample wait time was given for them to respond.

According to the participants' responses in this study, the moderator was essential for group support and for providing emotional support. It also appears that this community of practice viewed Gray as a member. She quoted a participant who stated that the moderator "knew what they were about and what the job was like. To read and feel that 'she gets it'" (Gray, 2004, p. 30). Her own comment, that a moderator must know enough regarding the practice to speak knowledgably and understand references, also seemed to place this moderator within this community of practice. In this study, it appeared that Gray's strong presence, as a moderator who encouraged the formation of a community, was the reason that this stage three community existed without a face-to-face component.

On the other hand, the contexts and analysis of neither the study by Hill (1999) nor the one by Whittle, Morgan and Maltby (2000) appeared to include any attempt to facilitate communities of learners, or communities of practice, yet in both cases conclusions indicated that significant learning through constructivist design occurred. Did this indicate that the presence of a sense of community, such as has been the focus of this project, is not necessary for knowledge construction using a constructivist learning design? Since the nature of constructivist design includes the social building of knowledge, which seems to overlap some aspects of community of practice, I looked

further into these studies to see if there was any evidence that a community may have existed, but may not have been reported because this was not the focus of the researchers.

Author-researcher, Janet Hill (1999), was also the instructor and designer of three courses in which K – 12 teachers focused on learning that would allow them to integrate information and communication technologies (ICTs) in their classrooms. She found that embedding a constructivist approach was very successful as learners interacted with ICTs. The existence of a community of learners, or practice, at first appeared to be missing in the description of her study as Hill stated that although the learners could choose to work in groups, as individuals, or a combination, the majority of them preferred working individually and being evaluated on their individual growth. A closer look at this study revealed that most of the course was taught face-to-face in a classroom. Thought questions that required responses beyond simple answers and also required applications to learners' own histories were shared via email, as were questions created by class members. Hill noted that the meaningful contexts thus provided by the students, who shared the common practice of teaching, were essential in their learning. A shared practice of teaching, sharing of contextual stories and histories, knowledge building activities and opportunities for face-to-face socialization all facilitate the development of a community. Is it possible that some measure of a community might have existed? Did the existence of these indicators of community contribute to the success of Hill's program?

Whittle, Morgan and Maltby's (2000) study also attempted to determine the effectiveness of using constructivist theory in course design, and no evidence of the presence or absence of a sense of community was noted. In this study, the course

designers changed learning activities from lecture, tutorial and individual assignments to having students work in small groups or pairs. The researchers applied a SOLO taxonomy to gage levels of complexity in learning and thereby concluded "(that) embedding student collaboration and problem-based learning …facilitates high levels of conceptual understanding" (p. 1). Again, the description of this study, like Hill's (1999), made no mention of attempts to facilitate a community of learners or practice. By looking directly at the data presented in the study, I noted that participants listed the following 'disadvantages' to the design of this course in their reflective paper assessments:

- Concern with thoughts and ideas being open to the scrutiny of the whole group (intellectual property issue)

- Slow response times from partner was frustrating

- Group work problems: low level of participation by team partner; work load not shared; collaboration was difficult at times.

(Whittle, Morgan & Maltby, 2000, p. 71)

The difficulties represented above seem to represent the antithesis of the functioning of a community of practice. They also suggest that, although a sense community may not be necessary for complex learning to take place, it may make aspects of such learning easier.

In her dissertation, Conrad (2002a) used interviews in a case study to investigate online learners' perspectives about what influenced their online activity in relation to the building and maintenance of a community of learners. The community that she studied appeared to have divergent views on posting messages about computer problems or personal crises. Participants' responses ranged from finding community through these messages to finding them a nuisance due to their lack of efficiency. Conrad's work

revealed other causes of friction within the learning community, such as divergent expectations of self and others in terms of time dedicated to online involvement, competition for marks, and pressures from outside or private complications. One of Conrad's headings 'Online Community, Respected yet Frustrating' suggested that the sense of membership and kinship with others described in stage two by Brown (2001) fit Conrad's study group more than either the acquaintance or camaraderie stages in Brown's work. If so, perhaps this group was on its way to evolving to a stage three resemblance of a community of practice. Conrad suggested that a sense of community did evolve, and added that the length of time for the online group experience made a significant difference in the development of a sense of community. She indicated that a cohort model of online learning as well as face-to-face opportunities also facilitate community building.

These studies imply that a community of practice does have an evolutionary process, and that the presence of such a community, though not essential for online learning to take place, may make such learning easier.

Constructivism and Objectivism in Online Learning

Jonassen (1993, 2000) and McLoughlin (2000) suggested that the design of online learning should be at the constructivist end of the constructivist - objectivist continuum. Cole (1992) felt that goal-driven as well as goal-free design is most effective for online learning. Her vision placed such design closer to the middle of the constructivist - objectivist continuum. Logan (2000) also supported this blend of freedom and structure, especially in the new world of computer and Internet learning. In the following research, which focused on a comparison of the effectiveness of these two paradigms in specific

aspects of course design, it was apparent that different designers who viewed their work as constructivist in nature were also working from positions considerably closer to the middle of the continuum, not at its constructivist or objectivist extremes (Blocher, deMontes, Tucker, & Willis, 2000; Hill, 1999; Gray, 2004; Gabriel, 2004). My interest in these studies was not only in how the course materials were presented, but also in how learning about the technology that made up the course interface was dealt with, especially in courses that were intended as constructivist learning. If the constructivist paradigm was identified as the choice for design, did it apply to the way the course was designed *and* the way participants were learning about the technology used to access the course? To what degree did this application of the constructivist paradigm extend to the students' learning about the technology that they used in order to access course materials?

Blocher, deMontes, Tucker, and Willis (2000) selected the following telling title for their study: *Preparing Teachers to Integrate Technology Using Constructionist Methodology: Don't Teach Me How I know I Should Teach: Teach Me How I Want to Be Taught.* The instructional design for this course was constructivist in nature as pre-service and veteran teachers worked with the technology they would eventually integrate into their practice. The researchers found that participants in this study wanted step-by-step instructions, but they wanted to teach these skills to their students by embedding them in class projects. Both the pre-service teachers and the veteran teachers consistently requested specific "how to" skill instruction rather than instruction that was "discovery" in nature. The authors conjectured that participants, especially the veteran teachers, likely had never been taught from the constructivist perspective, making adjustment difficult in dealing with a facilitator rather than a provider of information.

Hill's (1999) work also focused on teachers who were learning about integrating ICTs in their classrooms. As the course designer, Hill identified her instructional design as open-ended learning, which shares aspects of constructivism. It is driven by the interests of individuals in terms of "what is to be learned, how it is to be learned, when (or if) learning goals have been met, and what (if any) subsequent steps might be taken" (Hill, 1999, Defining OEL). Hill wanted students in her course to understand how to teach technology integration constructively through open-ended learning rather than objectively, so she focused on having them learn *with* the technology as well as *from* it. The result of her study supported this constructivist approach, but also described difficulties experienced by participants.

The advantages of the constructivist approach were that students had a clearer understanding of the phrase 'meaningful contexts', and they understood the importance of providing such contexts for their own students. Hill's students also recognized that reflection and self-assessment papers as well as class discussions and presentations assisted in skill development. Additionally, these participants reported increases in use, skill and comfort with technology, and they expressed enthusiasm for the courses and their constructivist approach by the end of the courses.

Disadvantages that were recognized through this study included the fact that shifting to this type of learning/teaching was difficult and required support and encouragement in order to build a firm, safe foundation for the learner. Also the instructor and students felt disoriented and disorganized during these courses. Finally, time-management skills were an issue, as learners needed extra time for exploration of both the technology and the new pedagogy (Hill, 1999).

Gray's (2004) work with the creation of community through a forum that she moderated also offered insights into constructivist – objectivist choices regarding the teaching of technologies involved in online delivery. In addition to facilitating a community of practice, she saw the role of moderator as one that facilitates learning and provides technical support. Participants in this study indicated that they had access to a moderator whose general facilitation skills included the ability to do technical trouble-shooting. The moderator helped participants to access and work with the online system. Participants stated that this role was especially important at the beginning of the course because it provided technical support and orientation to the technology for newcomers. In my opinion, these details imply that learner-interface information was provided in an objectivist manner.

In Gabriel's (2004) work, students were involved in an online elective for a Master of Education Degree that focused on leadership in the area of educational technology. Students were expected to constructively build a knowledge base in this area. A significant feature of Gabriel's program was that students were *first* introduced to the constructivist paradigm with which they would be expected to work, before they even began the actual course material. This was significant because students recognized and understood the view of learning as a process, not a product, at the onset of the course. The results of the study showed that students appreciated the constructivist process, especially the opportunity to review, revise and rethink. Of the three face-to-face sessions, that were part of this course, the second one had three aims. It dealt with technical issues resulting from the use of a new server, content issues, and it served as an opportunity to listen to a speaker. However, insufficient information was given to

conclude whether the issues connected to the new server were dealt with in a constructivist or objectivist manner.

The studies by Blocher et al. (2000) and Hill (1999) supported Jonassen's (2000) suggestion that a constructivist approach has greater scope in respect to learning benefits and offers longer-term benefits than do objectivist approaches. However, both studies suggested that these benefits come with disadvantages such as time management issues and feelings of confusion. These studies also appeared to be geared more to the perspective of the instructor, whose aim it was to facilitate a high level of learning, than the students who wished to learn in the most efficient manner possible. On the other hand, Gray's (2004) moderator approach reflected the learners' needs, as participants were given access to knowledge about the technology in an 'as needed' manner. Gabriel's (2004) work also suggested that an 'as needed' approach to teaching the technology is successful. Additionally, Gabriel's strategy of first introducing participants to the constructivist paradigm was powerful as it gave the learners a frame of reference for what they were experiencing.

Compelling reasons for each side of the pro-constructivist / pro-objectivist debate were provided by Blocher et al. (2000). On the pro-objectivist side, they stated that the yearly updating of software programs made time spent learning a single version seem like a waste. Also, different networking configurations between computer makes or service providers complicated the job of staying caught up with changes in technology. On the pro-constructivist side, Blocher et al. suggested that an instructor's purpose for using a constructivist approach was to teach strategies and problem-solving techniques that could transfer to new situations. Familiarity with a system through a constructivist design for

learning would therefore be superior to that gained from an objectivist approach to the same situation. They added that students who learned in a constructivist context found the learning difficult but rewarding.

After reading these studies, there seem to be more questions than answers. Should instruction regarding the technology used for online courses be embedded in the courses? If so, should this be done in a constructivist or objectivist manner? In making this decision, to what degree should course designers consider time management issues and tolerance for frustration by both students and instructors? Where should the focus of the learning fall – on content, on technology, or on both? Should they consider teaching 'how to learn' first, and once that is learned, will all other learning follow? Finally, to what extent can instructors focus on teaching 'how to learn' when the system in which they teach is geared for quantitative, efficiency-regulated, time-managed results (Logan, 2000)?

Learner – Interface Interaction

The third element of this study focused on learner-interface interaction. As stated earlier, Vrasidas (2000) felt that a fourth dimension, learner-interface interaction, was a necessary supplement to a tripartite model of distance education which features learner-content, learner-instructor, and learner-learner interaction (Garrison and Archer, 2000; Moore, 1989). However, in the studies that I have read, there appeared to be a trend to document students' frustrations with interface technology, but not to investigate or analyze them.

In the experiences represented by Gabriel's (2004) study, I have already stated that technical issues resulting from the new server were dealt with during the second face-to-

face session, but further information was not given regarding how the new server's systems were learned. In her study, Gabriel made other references to technical glitches, when she listed adjusting to Web-based learning, learning how to navigate the site, and lack of familiarity with the software as "challenges of the online environment" (p. 65). She stated that a time restraint found by participants in this research was "trying to learn to work in the online environment at the same time as learning course content" (p. 65), and the "Knowledge Forum" client version caused difficulty in finding new postings. However, no insights were given regarding how participants acted in handling these difficulties.

When Gray (2004) took time to talk to participants who never did log onto the community-building forum that she moderated, four reasons for their lack of involvement emerged. Two of these reasons represent learner-interface interactions: a lack of familiarity with online technology, and a lack of access to technology. Similarly, in Brown's (2001) investigation of community building in distance learning classes, fifteen intervening conditions were identified. Four of these related to learners' interactions with the technology used for the program. These included: students' varying abilities with technology, typing and writing; difficulties resulting from computer and internet speeds and capabilities; delayed receipt of software, and / or software problems; and time allotments needed to feel comfortable with software and faceless interaction with participants. Consistent with the above two studies, Conrad (2002a) also described learners' frustrations with technology; she also did not describe how this aspect of the online environment was dealt with by her participants.

Wiley and Schooler (2001) discussed considerations that exist in a technology-mediated environment compared to a classroom environment without web-based integration. I have used their construct as a basis for the chart below, adding details to expand on some of their considerations (see Figure 5).

Category	Classroom Learning and Teaching	Web-Based Learning and Teaching
Physicality	- Concrete (people, books, objects) - Limited information	- Pixels - Unlimited online information
Social Interactions	- Limited social interactions	- Unlimited social interactions
Conversational Pragmatics	- Discourse consists of gesture, expression, tone, volume, distance, etc. - Traditional listener-speaker relationship is immediate and ephemeral - Personalized (face to face)	- Listener – speaker relationship is altered - Face-to-face interaction is absent - Online interaction is concrete - Reflective time changes - Depersonalized (talking through a machine)
Written exchanges	- Written expression includes distinctive hand-writing and style choices - Reference to style books, dictionaries, thesaurus requires learned skill set	- Font choices instead of handwriting - Format and style choices suggested by templates - Thesaurus and spelling / grammar checkers can be activated to offer choices
Reading	- Static – in books, on the board	- Online layout is not static – may result in 'lost' text - Tends to be skimming. If deeper reading is required, most people print out the material

Figure 5: Comparison of technology mediated environments and classroom environments without web-based integration. (Wiley and Schooler, 2001)

Wiley and Schooler added, "while the linear structure inherent in most lectures and texts limits readers, (as opposed to the self-directed, discovery learning available on the Internet) it also supports their understanding" (p. 249).

Burch (2000) considered an epistemological twist to this analysis, "the issue is not what we can do with the micro-computer according to the best technically informed decisions, but what the instrument does to us" (Burch, 2000, http://phenomenologyonline.com/articles/burchmicro.html). According to Burch, our relationship with the micro-computer is often stated in terms of what it can do, therefore the very presence of it changes our lives as we take our cues about how to go about doing things from the instrument, itself. For example, if a computer is used, a certain range of exchange types (images, email, PowerPoint, etc.) become favored. This favoring of exchange types is added to by the use of other computer-related individual choices, such as font, style, templates, etc. as well as favored ways to navigate, read online, and so on. Ultimately, a learner's relationship with a computer becomes a complex set of choices (Burch, 2000).

Logan (2000) viewed these complex set of choices along with further choices connected to computer and Internet use as a means by which students learn. He referenced the work of McLuhan (1964) and Innis (1972) as he described how this impacts pedagogy. The power of this impact prompted Logan to advocate a change in the delivery of public education. He envisioned computers and the Internet as new languages taught in classrooms where "the student is the curriculum and the process is the content" (p 229).

Learner-interface interaction is an intensely complex area of study. From Wiley and Schooler's (2001) analysis of how computer interfaces currently impact learning and communication, to Logan's (2000) descriptions of how shifts in future deliveries of

education will be shaped by learner-interface interaction, we can see that this complexity is intriguing, and worthy of future study.

This literature review added relevant information about how communities of practice function, and the impact of constructivist or objectivist choices within an online learning context.

Section Three
Methodology

Qualitative Research, A Constructivist Process

Qualitative research focuses on what participants have to say about the essence of an experience, and how they have made sense of this experience.   As Merriam (1998) explained, "the key concern is understanding the phenomenon of interest from the participants' perspectives, not the researcher's" (p. 6). Schwandt (1994) adds that this method of inquiry has the "goal of understanding the complex world of lived experience from the point of view of those who live it. …That is, particular actors, in particular places, at particular times, fashion meaning out of events and phenomena through prolonged complex processes of social interaction involving history, language and action" (p. 118). However, Schwandt indicates that constructivist researchers believe that concepts and ideas within research are the creation of a researcher's mind, and that these inventions correspond to what exists in the real world. Guba and Lincoln (1994) see that this type of research can be constructivist in nature, as a study of knowledge "created in interaction among investigator and respondents" (p. 111). Schwandt goes on to reference von Glasersfeld's (1989, 1991) notion that researchers can not know a world that does not exist in their minds – an objective world apart from their experiences. The theme of constructivism therefore plays a role in my choice in methodology, just as it played a role in establishing the framework for this project.

For this study, I used interviews in order to capture the essence of each individual's experience. These interviews were open-ended and flexible, following the leads participants provided. Questions were asked to prompt participants to disclose their

views on their experiences from which I could mine insights into the research questions

that focus this paper. The initial questions used, along with their preamble, can be found

in the Appendix. They also appear below:

1. Would you please explain the context in which you first encountered the new
   WebCT format?

2. What were some of the challenges that you experienced as you used this new
   format?

3. For each of the challenges that you have indicated, please explain the
   following:

   - How did you identify the difficulty? What was your reaction at this time?

   - How serious was this difficulty? Would you please explain why you feel
     this way?

   - What strategies did you use to overcome the difficulty?

   - To what degree was the difficulty resolved?

I intended that the first question would ensure that participants were focused on

the specific experience that made up this case study. The following questions would start

discussions regarding individual experiences. As a pretest and an opportunity to examine

my own biases, I conducted a self-interview, recording and transcribing the results.

Through this process, I recognized what my own experiences were, and was cognizant of

the need to step back to allow participants to relate their interpretations of events,

ensuring that I would not paint my picture on top of theirs. I used the questions as

starting points, but allowed the path of a conversation to flow as participants explored the

topics. I used ample wait time to allow them to finish, and asked probing, open questions to pursue leads.

Online Setting

The Master of Arts in Communication and Technology (MACT) program is offered through the University of Alberta, Faculty of Extension. Its aim is to offer an understanding of the history, management issues, and applications of communication technologies in the context of a variety of occupations, encouraging participants to apply their learning to their own situations and to bring their perspectives into discussions that are essential to all of its courses. The entire program demands the completion of eleven courses. Three of these courses were carried out during face-to-face sessions that allow class members to interact inside and outside of classrooms, see each other, hear each other's voices, and work in pairs or groups. A fourth course had both a face-to-face and online component, and three additional core courses were purely online. Three electives were also required, and these were selected from online deliveries that might or might not include cohort class members, or they could be chosen from face-to-face courses offered at approved universities. The final course requirement for the MACT program was the completion of a project, which must be done individually under the supervision and encouragement of a faculty advisor.

The MACT cohort of 2002 consisted of eighteen adult learners who came from a variety of professional backgrounds. At the time represented by this study, most of these learners had completed the seven required courses that made up the core of this program. The participants of this study were enrolled in an elective concerning User-Centered

Design (UCD). Of the fifteen students enrolled in this elective, eight were part of the MACT 2002 cohort.

As the UCD elective opened, it became apparent that the delivery software for this course had changed from WebCT™, which the MACT 2002 cohort had become familiar with, to Vista™. This change related not so much to the functions that students had learned to expect, but related more to the organization and navigation of the site. As the course progressed, communication within the MACT cohort group in this course indicated that this community of practice was learning to adjust to the change and adopt the new format. Students could access discussions, course notes, and email via Vista™ software. Additionally, students were able to access supplemental course and research materials through the Internet and were required to refer to the mandated text. The delivery model used for this online learning allowed for both synchronous and asynchronous communication through chat and discussion features. Students were invited to join an initial welcoming and introduction phase online. Through this phase and throughout the course discussions, instructor presence was both regular and significant. The instructor posted contact information such as her email address and telephone number, and she scheduled office hours for chat or telephone contact. She also initiated discussions beyond course-work in order to nurture an aspect of community, and she posted audio lectures that allowed students to hear her voice. All of these efforts represent features that Aragon (2003) indicated are important in providing social presence in online learning.

As a co-participant in this course, and member of the MACT 2002 cohort, I had first-hand experience with the events related to this course and the response of the

community of practice. This experience enriched my understanding of the comments and references made by the participants during the interviews, and it allowed me to have the sensitivity to understand subtle meanings in the data and to comprehend the context (Strauss and Corbin, 1990).

Participants and Data Collection

Three of the MACT cohort subset that took part in the UCD course were asked to participate in this study. Because of the time allotment for this study, no more than three interviews could be conducted, transcribed, and thoroughly analyzed. Also, these three interviews, lasting from thirty minutes to one hour and twenty minutes, gave sufficient, rich material that I could mine for insights. The variety of backgrounds represented by the participants allowed for the possibility of three divergent viewpoints, and enough information surfaced to offer insight into this study.

Approval to proceed with this study was granted by The University of Alberta Faculties of Education and Extension Research Ethics Board. In keeping with their code of ethics, each participant was advised of her/his right to withdraw from the study, and was assured of confidentiality. Each participant completed a consent form, a copy of which can be found in the Appendix. It was made clear that pseudonyms would be used for not only the participants, but also to replace the names of any other people referred to in the interviews, in order to ensure confidentiality. Participants also each received, in advance, a copy of the questions that would initially be used, and were aware that discussions could follow leads as they emerged. The time and place for each interview was then arranged to maximize convenience and comfort for the participant.

All three participants were technically capable online learners, having had the experience of at least four previous online courses. All had full-time occupations that reflected the focus of their university undergraduate degrees. One was male and two were females. This 1:2 ratio loosely resembled the 2:7 ratio of the total 2002 MACT cohort, the 1:3 ratio of the MACT cohort involved in this course, and the 5:9 ratio of the total group of students who were enrolled in this course.

The first interview was with Emma, a woman in her mid-forties who worked full time at a university museum. The interview with Emma took place in my home, in privacy, as we enjoyed dinner together. Emma had visited my home on other occasions, as I had previously hosted family functions for the MACT 2002 cohort. An audio recording was made of the interview, and notes regarding points made by Emma were written down and consulted as various threads emerged. Some of these points were revisited further along in the interview. These notes were also consulted in the next two interviews in order to obtain the viewpoints of the other participants on the same points, and they were referred to as I prepared the findings section of this study.

The second interview was with Chester, a man in his late fifties who was an instructor at a remote college. Although this was a telephone interview due to his remote location, Chester could visualize me at my kitchen table because he had also visited at my home previously, and we both knew each other well enough that we could easily imagine the person at the other side of the conversation. This interview was also private, and the conversation was also recorded for future transcription. Again, reference notes allowed me to revisit comments that led to further insights related to my study.

The third participant was June. In her mid-twenties, June had just left a job with a charitable organization and was immersed in adapting to a new position with an animal shelter. Because of her very busy schedule, she opted for meeting at a university library where we found an unoccupied side room. Here we conducted the interview, which was also recorded. I used the notes from the previous two interviews as well as notes from this interview to continue to extend insights for my study. When a new thread emerged that might also have affected Chester, I contacted him and received his input in this regard.

For the two face-to-face interviews, I also provided paper copies of screen captures of the home page for the course as well as other views that participants had access to during the course, and to which they referred in their interview. These provided a reference when they were trying to remember just how the screens were formatted. These paper copies were also mailed to Chester along with the transcripts of his interview and the charts indicating the analyzed classification of interview materials. Emma and June also received their transcripts and their charted material via mail, along with a postage paid, self addressed return envelope to use if they chose to mail any changes back to me. All three participants viewed these materials and agreed with their accuracy. No changes were required.

Transcription and Analysis Process

I personally transcribed Emma and June's audiotapes onto a Word™ document, and hired someone to transcribe Chester's interview once a confidentiality agreement was completed. This possibility of hiring a transcriber was indicated in the consent letter originally signed by the participants. In order to verify all three transcriptions, I replayed

the interviews as I read the transcripts, making corrections if and when needed. By

following this process, I felt very familiar with both the general gist of the material as

well as specific points that I knew were salient.

I selected categories that indicated recurring themes (Merriam, 1998; Lieblich,

Tuval-Mashiach, Zilber, 1998; Yin, 1989). Because participants had received a copy of

the initial questions in advance and were aware of the focus for this study, the categories

for analysis at first appeared to closely resemble the focus of the questions; however,

additional categories emerged from a recursive study of the transcripts.

The process of tracking and marking significant passages involved colour-coding

the transcripts and copying and pasting participants' colour-coded words from the

transcripts into expandable charts that aided the organization of topics into subtopics. As

I navigated these charts, the colours of the quotes told me whose words they were. Each

chart or document focused on a single category. Four charts organized specific problems

identified by participants as playing a role in their attempt to adapt to the Vista™

interface. Headings used in each chart were: emotive words used to describe the

experience, impact of difficulty, method of resolution and degree of resolution. The four

problems identified by participants were:

- Difficulty finding icons for functions that participants expected to be able to use

- Understanding functions that seemed familiar but worked in unfamiliar ways

- Accepting change

- Finding time to learn how to use the Vista™ interface

Additional themes that related to the function of the group as a community of practice,

and evidence of constructivist and objectivist strategies were also mined from the

evidence in the transcripts. These charts and documents then became the sources for the findings section of this study.

In order to establish trustworthiness the transcripts and charted analysis were viewed and accepted as accurate by the participants, as mentioned earlier. Additionally, the participants' views were checked against each other and agreement and discrepancies were noted. The emergent information was also checked against existing research in the fields of community of practice, constructivism / objectivism, and online learning.

Section Four
Findings

As described in the methodology, the transcripts of the interviews were perused repeatedly for new evidence as each topic or subtopic was identified. The process was much like the process of picking berries; the bright obvious ones attract immediate attention, and the discovery of ones hidden by foliage becomes a pleasant surprise.

Responses relating to the construct of communities of practice were relatively easy to identify, and these were then binned into the following themes: knowledge support, moral support, comfort and ease, and 'them' and 'us'. Responses also focused on difficulties that learners experienced with the interface, but these were more difficult to analyze for themes. After much iteration in the analysis process, the themes that evolved for this topic were: dealing with change, missing signals, confusing navigation, exploring other features, and managing time. For each of the difficulties or issues identified by the participants, I looked for their own definitions of the experience, descriptions of the strategies they used to deal with the difficulties, and to what degree they felt the issue or problem was resolved.

Communities of Practice

One of the features salient to understanding the quotes used in this section is, when participants speak about using email, they mean private email within the MACT group rather than the email function that came with the course. June stated, "When it came to group, we used our regular email… I remember using the email, and not the Vista email." Chester recalled how this started. "Way back in the first spring institute (about 2 years ago) James had compiled a list of everybody's home emails or work

emails and distributed those, and so we would fall back on that." Emma first states that private email was used "more often than we used cyber space or the MACT café. (It was) our own list-serve, in a sense, that we operate on the side." She also noted:

It was interesting in the cohort…even if somebody sends a message out to the group, we always reply to the group. It's a way of communicating to the group. It's not just well – ah – Louise sent an email inviting us all to her open house. You don't just reply to Louise to say that you can't make it, you might reply to the whole group – 'Yes, I'm coming; or no, I can't come; or I wish I could be there', like Joan – you feel that sense of wanting to communicate with everybody, and kind of let everybody know how we're doing and where we're at.

Knowledge Support: What did participants say about the ways in which they shared knowledge about Vista™ with community members, or the ways in which community members shared knowledge with them?

First of all, participants wanted to make it clear that they were generally independent, and did not rely on the group for their learning. June clarified that she would "root around until I found it" before she would ask for help finding what she needed. She generalized in respect to all of her courses and her own personal nature, "regardless of who it was with, the work itself, I generally was always independent on. And that's just always – I've always done that."

After first stating that she challenges herself to figure the answer out, Emma talked about the steps she would take before asking for help, " I think I'm less likely, you know, the minute I encounter a problem, to say 'help, I can't figure this out.'… for me it was like OK, let's go methodically – go through it once, and if you can't figure it out

after three tries, then I'll ask for help." This independent viewpoint spilled over into how she viewed others who might share problems that she encountered. "My response is - oh, they'll figure it out eventually. They'll find it."

Chester did not speak directly about his independent learning, however he talked about having more time to explore the interface than most people in class, and he frequently indicated that this was how he learned about Vista™: "when I finally figured out by accident…"; "I just realized there's a second page…"; "that wasn't obvious until you figured it out…" ; and "It just dawned on me…"

In addition to learning about Vista™ individually, Community members were quite active in sharing information. June stated that she would ask when she couldn't figure something out, "I would send out the global email, and sometimes it was Chester, or sometimes it was Nicole, or somebody would email back how to do it…. I think it was John who pointed out that there was a page two." She would also read other people's questions and the answers they received in order to obtain hints, "I believe John sent it through the email that said where it was." She added that she relied "quite heavily" on "the hints and that sort of thing about the functionality of how to (use the interface)."

Emma stated that she gave the problem "three tries" before asking for help. When considering the actual act of asking for help, she said, "I think that sort of added, knowing that whatever kind of problems I encountered, knowing that I could ask somebody. … I knew that there were people in the cohort, … I had a comfort level -- I know who to ask, and I've got people on the side I can talk to." And later, "I felt a little more safer, I think, I know if I'm stuck I can call Chester, Joan, whomever."

Both Emma and June indicated that they did not send messages that helped other students. June qualified this by stating that she might have passed along a solution that someone else may have sent her via private email, but that she did not actually supply her own solutions. She said, "I didn't spend a lot of time exploring the site using it to its functionality, so I was possibly the worst possible resource out for anybody else to ask!" Emma explained, "I can't say I ever helped anybody – It was kinda a busy course and a busy time." Both June and Emma had full time jobs that involved not only extra hours, but also extra stresses at the time they were taking this course.

Chester expressed his view of how the exchanges of information occurred at three separate occasions in his interview:

I recall people sending emails asking questions about the features of the course. And I also recall people posting or emailing answers to questions or solutions that they had stumbled across on their own, and so we would all share that information outside the interface, I think, with each other to kind of help each other out….

We would start to message or email each other and say, "Did you know that in Vista you could do this …or did you realize that…."

People would ask questions and say, "Where in the heck is this assignment number two that (the instructor) is talking about? Everybody seems to have that but me."

When Chester talked about his role in either presenting information or looking for and using it, he said:

I know there was one time when I, I think I emailed everybody … about, "did you realize" or "silly me, I just realized there's a second page behind here of discussion threads – did anybody else catch this?" … and I recall someone else, at least one other person, doing the same thing….

I remember getting an email from somebody saying, "you know that there are other sections here" or there'd be comments about hidden, apparently hidden things in the interface. And I think I did the same thing to people.

Although others also participated, the two people most often credited with sharing needed information were Chester and John. John was described by June as always sending emails around. "Every time he found something new and exciting he would send emails around." From another area of the transcript, June states, "I know John got very excited by it, and he really enjoyed the detail of it -- so he had a lot of the answers on how to do a lot of the stuff I guess, probably because he really explored it and enjoyed what he was learning." John's position with a major computer company added to the expectation that he knew more about technology than most other students.

Moral Support: Both Chester and Emma were very clear on the positive effect that the presence of the MACT group had in terms of supporting each other emotionally. Chester spoke about the "comfort" being with familiar cohort members gave him:

I trusted that my cohort members would look after me and that I wouldn't be stuck on my own…. I always felt very comfortable and comforted and able to trust my cohort members absolutely and so I think that certainly helped me, maintain… that certainly helped to reduce or control the frustration I felt and after all you'd say " well, everybody else is suffering with the same thing." So I think

that, that prop… that level of comfort certainly helped get through the experience

of working with an interface that was very, very, poorly designed.

He stated that it was important to have a group where people could get general moral

support and where they could "commiserate" or "vent to somebody else" because

"several people were, I would say, extremely upset about this."

Emma reflected on an event when one of the cohort members missed a deadline

because she did not find it on the interface until after it was due. This student sent an

email stating that she would be quitting the course because of this missed due date as well

as other technical difficulties accessing postings. Emma's recollection was as follows:

I know we had an email from one of our cohort members where she had a

catastrophic event. Where she missed a deadline – she didn't find a deadline until

like nine days later. She missed submitting something, and that would be

catastrophic, I think, and then being able to sort that out.

I think what was interesting about that event was the cohort rallied round -

I don't think she wrote to the group, she just wrote to us – and that we all, you

know, kind of rallied around with advice, offers of help, I think that Edith had

offered to send her something in a different format that maybe her computer could

pick up. We all sent kind of encouraging words that said, you know – "Don't

give up or panic, you know, there is a solution to all this."

As a result of the "rallying" and encouragement, this student contacted the

instructor and made arrangements that allowed her to continue, and ultimately, complete

the course. Emma also found comfort in messages where cohort members would, in a

humourous manner, admit to difficulties that she shared. "I think it was Joan in our

cohort who did the same thing and then sent a message and went 'duh!' as she finally noticed there was a page two…. It was all kind of funny how embarrassed or stupid we could be!"

June did not initially identify a sense of moral support from the cohort. When asked, "Aside from getting hints from other people, were there other ways in which the cohort sort of helped you through the course?" she replied, "Realistically, no." However, like Emma, June valued the personalities of certain cohort members that she indicated would shine through in messages that were humourous and alleviated the stresses of the online course. June commented on how she looked forward to reading their postings, and how she could hear their voices as she read their messages.

All three participants reflected on how the cohort group prevented them from feeling inferior. June indicated, "It always makes you feel better when you're not the only one who can't figure it out. So, you know, when you know somebody is having the same problems, that always makes you feel better – 'cus at least you're not sitting there, wondering how come everybody else gets this." In a similar vein, Emma stated, "I think there was like, sort of a confirmation, or affirmation, because sometimes you don't want to be like the only stupid one in the class that can't figure something out, and with somebody else commenting you think, 'Oh thank God! It's not me – there's something screwy going on.'" This is echoed by Chester when he described feeling, "maybe I'm the last one to figure this out, … I did sort of feel that maybe everybody else in the world had known about it, but me, to that point." He went on to conjecture, "I would just make a guess, that people who were the most upset perhaps felt the least comfort from the other

cohort members. I mean people connect to different degrees, I guess, and I think that isolation is something that we construct ourselves in a way."

Comfort and Ease: Part of what made this a community of practice is the shared history and the knowledge and trust group members had already built. This has already been alluded to, and further evidence exists in the transcripts.

Emma spoke of her reaction when she first realized that a number of her cohort members were in this class. "Oh great! It's nice to see familiar faces. It was nice to establish that we were still part of the cohort in there and that we could help each other if need be." The reference to 'seeing' these people again illustrates the close bond that exists in this group. Her personal, hectic schedule may have prompted Emma to explain what was really important about her understanding of the cohort at this time:

> …It's more again just from previous experience and knowing the cohort and knowing that everyone is so supportive of everybody, and everybody knows that everybody's got their stresses and their busy times, and juggling various things in their lives. I think it's back to that comfort level of knowing that everybody knows that their time ebbs and flows throughout the programs. Not thinking that here's a real slacker here. Just knowing that there are more out there and that they are certainly aware that everybody is juggling. It was more that kind of thing.

She goes on to describe the cohort relationship as one where "you can hear their voices" and "you know that these people are on-going in your life. They will be living in your life – they will be part of your process that will be ongoing."

After reminiscing about the many courses and face-to-face sessions the cohort shared over almost two years, Chester considered, "We even had our own sort of

shorthand or jargon where someone could make a one word reference and you knew people would be laughing about it because they would make the connection to something that had happened a long time ago." After a short pause, he added, "You could tell how people would be laughing. You could! You could hear them speaking as you were reading the email or the online posting, and I think an off-shoot of that was that we got very efficient at communicating. You didn't need a lot of preamble. You didn't need a lot of warm-up, because the context was there, within our cohort. That had been established."

June also talked about understanding the personalities and hearing the voices of cohort members. "Someone would put a comment in the discussion that was either hilarious, or you know, throw some humour in it, or – you know – just – people you knew wrote things in the discussions that you could read and hear it coming out of their mouths."

'Them' and 'Us': The sense of community experienced by two of the participants in this study included distinct expressions of who 'they' were, and who 'we' were. This was already somewhat evident when the use of private email was explained. Not only was it part of the history of the cohort, it also provided a private forum that automatically excluded others. This exclusion may not have been intentional, but it did exist. Other comments continued to underscore the existence of the them/us differentiation.

When talking about the cohort's "enduring relationships", Emma contrasts it by saying, "with other people, they are part of your class, you do your thing, and off you go into cyberspace." She later goes on to say, "It's funny, though, because not knowing who the other people are, just knowing names attached to messages, they become less

'real', I guess. It's funny because when you do know the other people in the cohort, it becomes very much a different relationship." She goes on to "wonder what they're like …what they're doing" and she considers it 'sad' that "you don't really get to know them." Indirectly, Emma shows a sense of boundaries when she states that if she has a problem that she can't solve, she would first ask the cohort, and then go to the instructor. She does not include the option of taking the problem to the class as a whole, perhaps involving the other classmates. When asked how she thinks she would have responded had another classmate posted an incident like the "catastrophic event" posted by the cohort member, she replied:

> I think I would have felt terrible. I can't say if I would or would have not written to the person. It probably would not have been as personal a note, you know, just sort of touching base. I probably would have felt the same degree of horror for the person. … I'm guessing I would not have taken the time to respond, or otherwise it would have (been), you know, a one liner of support maybe.

When Chester replied to the question if there was a difference in his sense of support between cohort and other class members, he indicated, "Oh yes, very much so." He also noted that these other class members "wouldn't get some of the jokes. They didn't have some of the common understanding that cohort members did, for sure, because they didn't have …any of that shared experience." He added, "Although I might have appreciated them or I might have warmed up to them or gotten to know them a little bit … there was no way they could ever approach the feelings of comfort and sort of – intimacy, if that's the right word, of just comfort and ease and … camaraderie –

facilitation of communication that I had with my cohort." Chester then thought back to a course where no one else from the cohort participated, and he described the course.

> It was one of the most difficult experiences I had because I had none of the camaraderie – none of the sort of emotional props or that feeling of comfort that I was among close friends and going through this experience. … I didn't know what these people looked like, I didn't know anything about them personally, except probably where they were working … and so it was just very, very different – much more formal and much less rich in terms of communication content. It was really, I thought, quite constrained and it was actually a fairly stressful experience for me.

June, however, indicated that she had always been an independent learner. As an explanation, she reminisced about her high school and undergraduate experiences and stated, "I generally was always independent…I've always done that (worked alone)," and she further explained that she did not depended on a support group in the past. She also had difficulty thinking of ways that the cohort helped her through the course beyond offering navigational hints. She cited a waning interest in the course as well as difficulties with an older computer system, through which she could not access discussions easily, as the reasons for contributing "as little as I actually had to in order to maintain presence in the course." She added, "When I got lost (in the navigation of discussions), I quit reading them … I don't think that I read more than 2/3 of them through the whole course. To this day, I haven't read all of them." For June, there were no statements that differentiated between 'them' and 'us'.

Learner – Interface Interaction

The interview questions used the words 'challenges' and 'difficulties' when exploring participants' reactions to Vista™, therefore the responses allowed them to reflect those issues that impacted them most significantly. Each participant's unique perspective of a common experience contributes to a rich description of that incident. However, some significant experiences were unique to an individual. These, too, are recorded below with as much richness as that individual's recounting would accommodate. All the participants were encouraged to define the experience in their own words, indicate the strategies used to deal with the difficulties, and evaluate the degree of resolution to the issue or problem.

Dealing with Change: The change in interface from WebCT™ to Vista™ was not a complete surprise. Some hints of change had registered with all three participants. Emma explained that she had heard about it being tested, and knew that its introduction was imminent. She felt "kind of primed in a sense." Chester felt that there may have been a note that indicated that we would be using a new interface, but could not recall being given any other details about what to expect. June had also heard that a new format was coming, and thought that she had experienced it in a previous course. "I didn't know if that was the new one and any changes were so minor that it didn't affect the usability. … When this one showed up, I was a bit surprised by it."

Anticipation of what the new interface might provide was interwoven with participants' insights about how they felt about change. Emma's first reaction was confusion – "Is this the old WebCT™ or is this the new WebCT™, and what is going to be new?" Later, she felt, "I don't want something new, I want the old thing even though

the old thing was, … less effective, you know, simple. And when you're trying to wrestle with new content, new subject matter, and new learning, the simple is sometimes better." After considering how her age affected her attitude (As you get older I don't think change is easy), she laughs at a younger colleague's reaction (Joan is kind of funny at seeing the new WebCT when she said, 'Oh, I'm surprised at my Luddite – like reaction!') She responded in a hopeful manner to the changes, "The other thing about WebCT, there are so many things you can do with it. You know, they've offered so many different ways that you could present material, so many formats, so one thing might be a .pdf file, something might be just a word document, next thing you know you are in RoboProf. Or something else." And she took the attitude, "It's just sort of letting your brain get used to it…It just required more time."

Chester explained that he was happy with the original and expected the new interface to be a logical, developed extension of the original. He found that the structure of the older version "was ingrained in (my) head … I had to unlearn the logical layout of the older version and just surrender to the sort of chaotic – apparently chaotic – way of the new version."

June instantly liked the new home page. "It looked great… when you opened it up and saw what was there, it looked functional, it looked easy, it looked user friendly." But enthusiasm soon gave way to disappointment. "Very little on that page seemed to work. … there was always potential for it to be better. So I'm always interested in seeing the improvement to see if it was going to be better…so the exploring -- I can sit down and do that, and that doesn't take too long. …and a good chunk of it is fairly intuitive,

and face it, icons didn't change so much, but the actual using of it, where things weren't working like they ought to, that was wasted and a good chunk of time was gone there."

Chester and Emma also reflected their disappointment. Emma stated the interface was "somewhat disappointing…there were some limitations, quite a few, in the old one and then, when we encounter (the new one), is it an improvement?" Chester describes Vista™ further:

(It was a) more attractive version of WebCT. It had essentially many of the same features, except that it seemed very complicated and circuitous and wasn't obvious at all…. It was not just that it was different, it was that it was a step backwards in terms of functionality. I'm talking about the design of the WebCT Vista. It wasn't just different, which we all, I think reasonably, expected. It was a step backwards in functionality and ease of use, and it was almost like a punishment. It should have been a better Swiss army knife, but it was far worse I thought, and so it was very disappointing.

Missing Signals: Through their experiences with the previous interface, the participants had learned to expect obvious signals that indicated new email and new discussion postings.

Emma simply stated, "you didn't know that there's mail." June further defines this issue by saying, "If I actually had personal mail coming through WebCT, the only way I would know is if I actually went into mail to look. It was never cued up. It indicated that it ought to be, but it wasn't." The only way the mail icon was visible was when she clicked the tiny icon for 'more tools' that appeared in a narrow frame close to the top of the window. Chester added that this took a bit of effort to locate, initially.

When talking about this, both Emma and June described it as frustrating or annoying, but not a major problem because it was resolved early in the course. The method of learning about how to access mail, or recognize when new mail arrived was through exploration. June added "I believe John sent it through the email (private) that said where it was."

June indicated that the frustrations in finding mail and not being aware of new messages were the cause for her preference in using private email. "For myself, I think it was handier because with your regular email at least you knew you had something waiting … I remember using the email (private) and not the Vista™ email, but I'm not sure if we tried or if we were all just too frustrated at that point."

A clearly visible signal indicating that there were new discussion postings was a feature of the previous interface; but according to Emma, in this one it was "a very subtle, little, green thing in the corner of the envelope for new messages". The impact, to Emma, was that "The bulk of your course takes part in the discussion area, and we didn't know if there were new discussions. …This is about learning and communication, and they put the most important part of the program in the smallest place possible."

June's frustration showed in her comment, "I had to go into discussion each time to see if there was anything there… In spite of there being a place on the Vista home page, it never ended up showing up there." She explained, "in the old format (you could see) how many new ones (discussions) there were. If there were only three new ones, you could put it off for a little while and wait until there was, like ten."

Chester's observations concurred. He expressed that it took effort to figure this out, and that, initially, it interfered with " the main feature, (which) was participating in online discussions."

June reasoned that this problem was "irritating, but not difficult… Because if you were going to go in there (the interface) in the first place, you were probably going to go into the discussions – and there was always something (new). So realistically, you were never going in there to look if there was (something new), you would assume there was, and you were going to go into it anyway."

All participants agreed that they learned about this facet of Vista™ from their own exploration, and they indicated that they just adjusted to the change.

Confusing Navigation: Learning how to navigate the new interface was identified as a more significant issue than missing signals for mail and discussions. Emma, Chester, and June found themselves dealing with frustrations in navigation at three levels: a general level relating to the site map, a specific level regarding the way discussion postings were displayed and accessed, and an even more specific level regarding discussion threads that moved to a second page.

Emma described what she faced when first entering Vista™. "You would get a page that looked like the old WebCT, but it had a different frame around it." It became apparent during the interview that Emma used a different entry point from the home page that June described. According to June, the entry looked quite different from the old interface, appearing "user friendly" and "full of potential", but having few working links. It became apparent that Emma consistently entered on the student course view rather than the home page, and she did not discover the home page until considerably later in the

course. The student course view was very similar to the old interface, with the exception of the bar Emma describes as, "so new, if you didn't know that (the tiny symbols) were icons, you wouldn't get anywhere." This, then, became the base from which she attempted to navigate the site. Further difficulties were evident in her comment, "I'm a visual person -- in the old WebCT it was very linear -- in the new WebCT it was often hard to figure out where the next new thing was." Both June and Emma relied mainly on independent exploration to find their ways through the site, but Emma noted that "when you think you've figured it out and you return to it again a few days later, you wonder, 'Now where did I find that?'"

Chester described the layout as "fuzzier" and "very complicated and circuitous". He stated that he would "give up after a while because (he was) tired or had a reading to do, or had to go to work or something." Also, exploring on his own "would sometimes be fruitless", and "it was very disappointing." He would find himself "wandering around on the opening page, unaware of the content that was behind there" and he described "navigational things and features that seemed to go nowhere." Learning about Vista™ would occur when he figured it out or someone sent him an email saying, "you know that there are other sections here". He picked up on "comments about hidden, (or) apparently hidden things in the interface" and he also sent out messages that explained his discoveries if he felt it could benefit the group. It was at this point that Chester stated, "We all knew each other, and we were all going through it at the same time, and so that certainly gave me lots of comfort because I trusted that my cohort members would look after me and that I wouldn't be stuck on my own." He summed up his experiences with attempting to navigate this site as follows:

In their wisdom (they) had revamped the layout and the structure of the thing entirely, so it was more like a puzzle than a map. Where the old one you could quite easily see where you were, what your other choices were and so on -- this new one, it's like there were pages in the book that you didn't even know it was a book until somebody told you. … I'd say "where are things - I'm missing something", and you'd poke around to the mail icon and the different things and, and see if there was another way to get there. It's like finding a hidden door in the passage way or something and the thing that added to the confusion, I think, was that not all the features that were there in Vista were used by the instructor, and so some of those avenues were dead ends. And so you'd think, "well are all those dead ends or do some of them actually go somewhere or how do I get there?"

Emma described an event that involved another cohort class member who had missed a step in the navigation of this site and who felt that she had to withdraw from the course as a result of this:

I know we had an email from one of our cohort members where she had a catastrophic event. Where she missed a deadline – she didn't find a deadline until like nine days later. I felt just awful for her. She missed submitting something, and that would be catastrophic, I think. …

(We) rallied around with advice, offers of help (and) sent her something in a different format that maybe her computer could pick up…We all sent kind of encouraging words…

Aside from the general navigation of the entire site, participants in this study also identified the organization of online discussions as causing problems. "The layout of the features did not at all seem evident to me" and "there was, I think, more than one way to get around," were Chester's impressions. He also expressed that people may not have participated in some online discussions because, "it was that they just hadn't been able to figure out the format, and how to get to these different features", and he felt that this was "one of the major issues".

Emma also found that discussions could be accessed from two places – through the course modules or through the icon in the narrow top frame. She had difficulty following the organization of the discussions because "things were broken up into topics" instead of the order of time, and "they would sort of cascade down in so many ways….I was never sure if I was answering in the right discussion group – group of messages – or if I was on the wrong topic…or did I reply to the right person?" Emma commented, "It always felt – messy, muddled" and found that this was the most problematic aspect of the website and it made the least sense to her. She attempted to solve her problem by using organizational options. "I'd click 'thread', click 'unthread' and I'd see the difference, and 'collapse all', and 'expand all'. I wasn't quite sure what the difference was. I kept clicking to see what am I getting, to find out what version I like to work with… " The effect of this on her participation in the online discussions was, "(I would) just sort of pick something and send a message back." By the end of the course, she felt that she had not resolved the issue. "I don't think I ever quite learned how the discussions worked. I mean, even five months later, 'Oh my God! I never read that message!' I went back and looked at it, and there's still an unread message!"

June's frustration was exacerbated by a problem that neither Emma or Chester experienced. The issue that was "probably the worst one for me… probably my biggest frustration" is described by June as follows:

When we went into the table of contents for the course module, it would bring up and download the word documents for the units in the content – the same one – the introduction one – before you ever went into the one you were looking for. It would take the first one. And I had a very slow computer, comparatively speaking, so any time I would try to go into the course modules I would sit there, probably for about 15 minutes, while it downloaded the first one before I could close that and then go into the next set.

And it didn't just load like it was supposed to in the screen, as a part of it, it would actually download it into Word. …

I didn't go into (the online discussions) every day like I did with the old WebCT stuff, because I knew if I went into them, I was going to have to sit and wait for the thing to download, before I accessed this certain thing…

June describes this recurring frustration as "brutal, and it was brutal all the way through… and it was awful! All the way through." She experimented with looking for a back entry to avoid this problem, but did not find one. As a result, "I usually didn't go (to the discussions). I checked it every two or three days …I really didn't go in there unless I was going to get in there and get readings out and just do everything in just one shot so I didn't have to use it again." Her discouragement is reflected in her answer to how she dealt with navigating the discussion messages. "When I got lost, I quit reading them…."

Participants related animated stories of their experiences with a page-turning function that was activated by a small number 2 that had to be clicked. The cohort group was not accustomed to this feature, and it took them a while to learn that it even existed, and how it worked. Emma told this story about how she remembered learning about this feature:

> I remember that we all had to post something on one of those weeks … and I must have posted mine three times and wondered, 'Where is it? It hasn't shown up.' And I figured 'Oh my God, I've missed the deadline. It's gone into cyberspace!' I reviewed – I did it three times! Twice I kept reviewing – it worked before, why isn't it working now? The next day, I'm saying, 'Oh, there it is… It's on a page two! And there's three of them there! It took me a day! …

> I think it was Joan in our cohort who did the same thing and then (she) sent a message and went 'Duh!' as she finally noticed there was a page two.

Once she got past the "panic moment" and the "process of kind of banging your head against the wall three times" Emma found, "It was all kind of funny how embarrassed or stupid we could be…I noticed that a couple of people did the same thing. So it was kind of funny."

June also related a story about how she posted a project or feedback twice because she "couldn't figure out why it didn't show up before." She added that she could not remove the postings and that new discussions started under each one, which made the threads difficult to follow.

Chester shared his experience in this way:

I think we were two weeks into the course before I discovered there were more

pages of messages and postings behind the first one that were not at all evident to

me…. People would complain about posting, and then nobody responding to

them, and I thought to myself, 'Well, I responded to everything that's there. How

can they say I'm not responding?'… I don't remember what it was, but it would

take you to another page, and you'd go 'Oh my God, there's four more discussion

groups going on that I didn't even know were there 'til now!'

Chester added that "people got very frustrated" and it was "a big step backwards in my

experience". This was the point at which he felt, "maybe I'm the last one to figure this

out, but I did sort of feel that maybe everybody else in the world had know about it, but

me, to that point." He recalled emailing or posting his discovery of the second page and

noting that at least one other person was doing the same.

June thought, "It was John who pointed out that there was a page two…. I would

have looked around there, posted it four times, but once somebody points out that there

was a page two and you're supposed to click on this two to move it across, you know,

then it's obvious." June summed up the consensus that this was a one-time problem,

solved once this aspect of the navigation was learned.

Exploring Other Features: As students explored the Vista™ site, they

experimented with some of the other features, especially those linked by the home page.

Chester spoke of these links as 'going nowhere', and June itemized her experiences with

the ones she tried:

- The grades thing never worked for me. It always said I had no new grades

  whether I did or I didn't.

- I attempted to (use personal bookmarks), but then, because very little on that page seemed to work, umm, I really didn't do much with it.

- I tried …to use the calendar, but it would not download to my particular version of the palm pilot, which many things don't so that wasn't a huge surprise….I just used my own calendar on my Outlook

- Very little on that page seemed to work

Emma used the calendar to check up on due dates and features for each week, but she never inserted her own information. She also noted the presence of pop-ups, "little boxes that opened the minute you logged on … I remember, which was kind of nice (and) which the old WebCT didn't do, is (the instructor) sent a Valentine greeting, (but) some people never got it or saw it." When summarizing her view on the capabilities of Vista™, Emma stated:

> You know, they've expanded what we can do in the Webct, but maybe in the process of adding a white board and all these fancy things that nobody really used that much in any of the courses that I've taken, they diminished the most important part, which is the discussion. The whole point of on-line learning is the discussion amongst students, the instructors, and the mail – and that's the communication part.

I asked each participant if she or he used the 'help' feature. Chester could not remember if he had tried it, and thought that if he did, it wasn't of any help. He did indicate that he would generally use a help file in new software. On the other hand,

Emma was emphatic. "I hate online help! Never use it!" June was also clear. "No, I didn't. … If I hit it, it was by accident."

Managing Time: When considering if her time was wasted in learning this new interface, June differentiated between what was a good use of time, and what was not. "Sitting and waiting for downloads is wasted as far as I'm concerned, but the figuring out of the Vista compared to WebCT – (there was) always potential." Also, "Where things weren't working like they ought to, that was wasted, and a good chunk of time was gone there."

Emma talked about taking time to explore, having to retrace steps, and trying three times to figure things out before asking for help, but she expected that she would need time for this. "It's new… we all have to expect that, and when there's new things, it's back to being a bit patient, being adult about it, try it out, figure it out…To be able to breeze right through it is not possible." Her thoughts about time use diverted to another time-related issue, that of budgeting time for online learning:

> Everything is so fast in (online learning) and your time was of the essence and you may set aside a little bit of time… If you spent two hours on a Monday night that you reserved for reading messages – and getting involved in discussion, and you spend two hours instead on figuring out where it was, you've lost an evening… and you don't have a lot of free days, and you felt a lot of 'I'm behind, and I'm behind, and I'm behind'… It was a high-discussion class, and I'm just running as fast as I can and I can't keep up, and I wasn't as involved in parts of the discussion as I would have liked to have been. Something had to give…

Chester respected the issue that others had with time restraints, and he reflected on his own good fortune regarding what he called "the luxury of more time than almost anyone else in the cohort." He stated:

> I was annoyed, but I think other people were terribly upset by (interface difficulties), and maybe the time factor had something to do with that…. Because of my work situation and working away from home and being away (from my family), I had lots of time to devote to my studies, because I didn't have my family at hand and my pets and my own house and all that stuff.

Thus the richness of the interviews in providing insights into the participants' views of the learning of this community of practice has been documented in the section above. These findings will now be used in order to reflect the framework concepts for this paper, and they will be compared to the results of the studies cited in the literature review.

Section Five
Discussion of the Findings

The subset of the MACT 2002 cohort involved in the UCD course used the power of their community of practice when they worked with a 'messy' situation resulting from a change in the interface of the software program used to deliver their online course. Individuals within this MACT community of practice contributed to, and benefited from, the group's knowledge in dealing with this change.

In light of the framework constructs and the revelations of the literature review, the findings in this case study give additional insight into the ways in which the community of practice and individuals in this community functioned in this situation. As an organizational framework for the interpretations of the functioning of this community of practice, I will again use the three components of Wenger's (1998) model: shared repertoire, mutual engagement and, joint enterprise (see Figure 1). Added to this are insights into their choices of constructivist and objectivist learning strategies, as they managed their difficulties with the new learner-interface.

Communities of Practice

Shared Repertoire: As stated previously, shared repertoire includes the concepts, stories, artifacts and tools that all members of a community understand and use as needed. The shared knowledge that impacted this study consisted of this MACT subset's common experiences in previous courses, and individual's learning.

Common experiences from previous courses included not only course content, some of which contributed to the UCD course projects, but also artifacts, like the 'list-serve' or home email addresses shared by the group. Also, previous common experiences

with WebCT™ contributed to the group's interpretation of Vista™. When the participants referred to Vista™'s functions, it was often in terms of comparison. For example, June used "old" and "new" in comparative positions when identifying the interface she meant. In their descriptions of the lack of mail and new discussion signals as well as the navigation issues all three participants used these "old" and "new" references in order to clarify their expectations and frustrations with Vista™.

Knowledge that individuals possessed also became shared knowledge, in an as-needed manner. When June told of John's expertise with computers, it was with an underlying understanding that this was expert knowledge due to John's work in that field. "I know John got very excited by it (the new interface), and he really enjoyed the detail of it – so he had a lot of the answers on how to do a lot of the stuff." As Chester problem-solved in his exploratory manner, his newly discovered knowledge was shared via email. June felt comfortable sending out a "global email" asking for help, knowing that if the information were out there, "somebody would email back how to do it."

In addition to these kinds of shared knowledge, participants also spoke about the personalities of other cohort members as though this understanding was shared. All three talked about hearing the voices of the authors of emails. June valued the humourous messages that would allow their writers' personalities to shine through. Emma was happy "to see familiar faces" when she first logged on to the course, and she knew that everyone has an ebb and flow to busy times; there were no "real slacker(s) here". Chester understood his fortune in being able to find time that allowed him to explore and learn about Vista™, because he knew that other cohort members had demands that made finding time more difficult.

A single word or symbol would represent entire stories for this group. Chester stated, "We even had our own sort of shorthand or jargon where someone could make a one word reference and you knew people would be laughing about it because they would make the connection to something that had happened a long time ago." The animation in the descriptions of stories about how each person discovered the page two icon in the organization of a discussion thread had all the elements of narration: characterization, plot, and setting. This would likely become another one of the shared stories that would later be understood within this group by a single phrase or symbol.

The power of stories is explained in detail in Cohen and Prusak's (2001) book, *In Good Company: How Social Capital Makes Organizations Work*. According to these authors, each story involves one or more protagonists who respond to a challenge. In describing the results of this challenge, the storyteller explains the protagonist's success (or failure). This experience then becomes part of the lesson that the organizational culture supports. 'War Stories' are one classification of organizational stories that Cohen and Prusak discuss. These are stories about 'disasters' with which members of a community can identify. Because the disaster is often a shared experience, expressing an emotional encounter with it helps to make the teller a member of that community. The audience, usually other community members, "laugh, but their laughter comes from recognition" (p. 124). The response of the protagonist to the disaster highlights the values shared by the community. In this case study, stories about missing the page two function appear to indicate the values of understanding humility (Chester commented, "Silly me!" and Emma described Joan's use of "Duh!"), conveying mutual concern

(Chester commented that "people got very frustrated"), and using humour to deal with mistakes (Emma thought it was "funny how embarrassed or stupid we could be").

Mutual Engagement: The component of mutual engagement consists of relationships and social complexity in the community, and it refers to how members do things together in an engaged manner (Wenger, 1998).

In the findings, we see that all three participants were engaged in learning about Vista™ through the exchange of ideas and knowledge. Some appeared to receive more than they gave at this time. A shared understanding of how people had busy times and other stresses that affected how much they could contribute is evident when Emma explained, "everybody knows that everybody's got their stresses and their busy times…that their time ebbs and flows throughout the programs… they are certainly aware that everybody is juggling." Chester expressed a shared understanding that a lack of time caused difficulties for some group members. Wenger (1999) indicated that members of a community of practice who appear to take more than they give would eventually be excluded, however Chester's acceptance of this imbalance implies that reciprocity either occurred before this event, or would occur in the future. Because of their common understanding that participation in offering information would not be equal, all participants were included in constructions of knowledge that supported the joint enterprise of learning about Vista™.

Participants also shared their attitudes towards the new interface. Chester felt that "everybody else (was) suffering with the same thing" so they could "commiserate" or "vent to somebody else"; June said, "When you know somebody is having the same

problems, that always makes you feel better"; and Emma remembered feeling, "Oh thank God! It's not me – there's something screwy going on."

They also supported each other through encouragement. The "catastrophic event" that Emma recalled included the cohort "rallying around" this person. They "all sent kind of encouraging words that said, … "Don't give up or panic, you know, there is a solution to all this." Documents were reformatted for her in order to allow her to complete the course.

Chester "trusted that (his) cohort members would look after (him)…" and he always felt "comfortable and comforted and able to trust my cohort members." He added, "You didn't need a lot of preamble. You didn't need a lot of warm-up, because the context was there, within our cohort. That had been established." Emma explained, "These people are on-going in your life. They will be living in your life – they will be part of your process that will be on-going."

Joint Enterprise: Joint enterprise is something that is constantly renegotiated within the group, and it is addressed through mutual accountability, multiple interpretations, rhythms of interactions and local response (Wenger, 1998).

There were two levels to the joint enterprise with which this community of practice was working during this case study. First, all participants were involved in a university course that would allow them to complete their program, in this case the UCD course. Secondly, they were all engaged in overcoming obstacles that Vista™ presented in this endeavor. This study deals with the second focus.

When these MACT students embarked on the UCD course, they did not expect to face problems with the interface. They knew that Vista™ was coming, but they didn't

know when, and all expected that it would be an improvement over the WebCT™ interface they had been using up to this time. When problems became apparent, the group renegotiated their focus of learning to include learning about Vista™.

Was learning of Vista™ an educational goal? Not being able to navigate Vista™ meant not accessing the UCD course. The learning was incidental and unacknowledged as an educational goal, but it became the goal taken on by the community of practice. This is in keeping with Wenger's (1998, 1999) and Lave and Wenger's (1991) concept that in communities of practice, the goals evolve from within the group and address the needs of the group as they occur.

As stated earlier, leadership also emerges from within a community of practice and leadership changes according to need (Wenger, 1998, 1999). Sometimes leadership is reflective of what Wenger refers to as 'competence' (knowledge). In this case, the person who holds that competence takes the leadership role. The findings in this study showed that different cohort members offered this competence at different times. Chester, John, Joan and Nicole offered hints about navigation. Edith reformatted documents as needed. If anyone asked, June passed on hints she received after she sent out a "global email" for information. James, a member of the MACT 2002 cohort who was not enrolled in this course, provided the list of private email addresses. No one person stood firmly in the role of competence leader. People moved in and out of this leadership role supporting Brown and Duguid's (1991) observations that community members cycle in and out of leadership roles. Even the nature of the messages that offered information included phrases like Chester's "silly me …I just realized…" and Joan's self-reference, "Duh!" which gave a sense of everyone being at the same level.

When Emma and June, and other cohort members observed and learned from the messages that were exchanged, their behaviour was typical of what Lave and Wenger (1991) described as learning at the periphery. Lave and Wenger also predicted movement from the periphery into competence and back to the periphery. Chester described this when he stated, "I also recall people posting or emailing answers to questions or solutions they had stumbled across on their own, and so we would all share that information … to kind of help each other out."

Wenger (1999) and Wright (2001) warned about communities that became insular. Was this community of practice insular?

Due to the use of private email as the mode of communication for much of this learning, other classmates and the instructor were left out of this community's discussions. This meant that 'others' were not able to add knowledge or take advantage of the exchanged information. It is a shortcoming of this study that I did not interview either the instructor or other classmates to determine if they shared or were aware of the difficulties that were experienced. It would also have been informative to determine if this community of practice's boundaries were apparent, and if so, did they seem permeable. Another question that could have been explored was, did the community's functioning in this regard have any impact (positive or negative) on the rest of the class?

The feelings of being separate from others were not expressed as feelings of superiority or in negative connotations. Emma describes the vision of other UCD class members heading in different directions in cyberspace after the completion of the course, and compared it to the community member's ongoing relationships. Chester recognized that others would not understand the jokes and personalities in some of the messages that

cohort members produced. Both Emma and Chester indicated that, with time, the relationship with these classmates might have grown. Chester said that he "might have appreciated them (the other classmates) or warmed up to them, or gotten to know them a bit" with more time. Emma "wondered what they're like (and) what they're doing."

Cohen and Prusak (2001) described the importance of trust in establishing the social capital necessary in building learning communities. They indicate that this trust can grow over time and through repeated interaction. Time, repeated interaction and the trust that this can produce also become the catalysts in the evolution of Brown's (2001) three-stages of communities of learning. Perhaps Chester's speculation of what would have happened with more time, combined with Emma's curiosity about the others, reflect the possibility that this UCD class could evolve from a community of learners into a community of practice, if additional time together had occurred.

Learner-Interface Interaction

As already stated, the joint enterprise in this case study focused on learning about the new interface. In order to establish whether learning was constructivist in nature, it must be shown that the group used prior experiences and a value system, and that students explored, experimented and shared their findings in a social context (Jonassen, 1993). Prior experiences with WebCT™ were communicated in order to make sense about differences with Vista™. Emma expressed the value of discussions in order to learn when she stated, "The whole point of on-line learning is the discussion amongst students, the instructors, and the mail – and that's the communication part." When new information was constructed, individuals would inform the group, and the group would inform individuals (Brown and Duguid, 1991).

This interaction between group and individuals reflects Vrasidas' (2000) description of personal constructivism and sociocultural constructivism. She indicated that active, individual knowledge construction involves enculturation into related practices within a society. As participants actively sought to understand Vista™, it was for the purpose of using it to interact with the full UCD group in order to understand course materials. Without individuals' knowledge construction, the MACT subset's participation in the course would have suffered; without the need to interact with the other UCD students regarding the course work, individual (and MACT subset) knowledge construction about Vista™ would not have been necessary. This appears to support Vrasidas' view that trying to isolate one from the other was difficult, and that the two approaches complement each other.

The advantages of constructivism were demonstrated when explorations were fruitful. The constructivist learning that occurred dealt as much with understanding the interface as with developing the strategies used to decode and negotiating this learning in a social context (Blocher, deMontes, Tucker and Willis, 2000; Jonassen, 1993; Hill, 1999). June showed that she valued the constructivist strategy of exploration when she indicated that time spent in exploring the site was not wasted time. She anticipated the potential of many, great new features in terms of mark access, calendar functions, and other links on the home page, and she explored each of these. Chester described much the same strategy, and held the same expectations. Emma also recognized that the rewards of figuring things out, by herself, would need time, and she was willing to spend that time.

There was no evidence of Blocher, deMontes, Tucker, and Willis's (2000) conjecture that older students who had likely never been taught from the constructivist perspective would find difficulty in the constructivist approach. Although the evidence above indicates that these participants embraced the possibility of learning from this approach in this course, it must be noted that they had already experienced seven courses that had groomed them to approach learning in this manner, therefore their acceptance of constructivist strategies was to be expected.

The confusion and need for support described by Hill (1999) and Blocher, deMontes, Tucker and Willis (2000) was also apparent in this case study as participants practiced constructivist strategies. Participants wanted solutions that would not require the large amount of time that was dedicated to learning about Vista™. These results are in keeping with Conrad's (2002a) dissertation where she determined that online learners set aside a period of time for their coursework and they felt that this time allotment was used up when they had to solve technical difficulties. Emma indicated, "everything is so fast, and your time was of the essence and you may set aside a little bit of time…If you spent two hours on a Monday night that you reserved for reading messages – and getting involved in discussion, and you spend two hours instead on figuring out where it was, you've lost an evening." June also thought that time was wasted when, 'things weren't working like they ought to." Chester described giving up "after a while because (he was) tired or had a reading to do, or had to go to work on something." The tension between wanting to unravel this interface and the need to move on to learning course material created difficulty for these learners.

In keeping with Cole's (1992) blended view of constructivist and objectivist design, we can also identify that some objectivist learning strategies were chosen by the participants in this case study.

June called for answers to her questions, and classmates supplied these in a 'just-in-time' manner. Other members of this community of practice, who could observe the questions and answers emailed within the cohort, were also supplied with this information through this objectivist strategy. It is interesting, however, that 'help' features in programs like Vista also offer 'answers', yet when participants were asked if they used Vista's 'help' feature Emma and June emphatically indicated that they did not, and Chester wasn't sure if he had used it, but suggested that if he had, it was not effective.

A summary of the findings in respect to the five interface difficulties identified in the interviews has been consolidated in a chart (see Figure 6). Each participant's responses to the five problems are noted in terms of whether the student worked on solving the difficulty alone, referred to the community for hints, and/or shared hints with the community. Descriptive words or phrases that participants used when they talked about the issue are also indicated, as is the degree of resolution achieved for the difficulty.

Problem or Issue	Participant	Independent search for solution	Referred to group for direct instruction	Supplied direct instruction to group	Descriptive word or phrase	Resolution
No signal for mail	Emma	3			Frustrating or annoying	Resolved early in course
	Chester	3			A bit of effort initially	Resolved early in course
	June	3	John sent it through email		Frustrating or annoying	Resolved early in course
Finding the discussion icon	Emma	3			Annoying	Resolved early in course
	Chester	3			Initial barrier	Resolved early in course
	June	3			Irritating but not difficult	Resolved early in course
General site navigation	Emma	3			Disconcerting, disappointing, not linear Described 'catastrophic event' for someone else	Sufficiently resolved to access course features
	Chester	3	3	3	Fuzzier, complicated and circuitous, disappointing, chaotic, not logical, fruitless exploration, links going nowhere, hidden things	Sufficiently resolved to access course features
	June	3	May have passed on information someone sent her, if asked		Very little on homepage worked	Sufficiently resolved to access course features
Navigation of discussion board (not including the page 2 issue – see below)	Emma	3			Not linear Felt rushed, hard to keep up with volume Can't keep up Something had to give…	Not resolved (had unread messages at end of course)
	Chester	3	3	3	Layout not evident,	Resolved (accessed all messages)
	June	3			Automatic download when accessing discussions was biggest frustration, probably the worst, brutal, awful Volume of messages difficult	Not resolved Quit when she 'got lost' (had unread messages at end of course)
Page two in discussion thread	Emma	3	Joan did the same - "Duh!"		Panic moment, funny,	Resolved
	Chester	3	3	3	People got very frustrated Big step backwards	Resolved
	June	3	John pointed out page 2		Frustration	Resolved

Figure 6: Summary chart of responses to learner-interface issues

The chart in Figure 6 indicates that most of the learning was done through independent exploration, a strategy which is constructivist in nature; however, some of the sharing of information occurred through direct instruction exchanged by the cohort. This is exemplified by Chester's comment that people emailed "answers to questions or solutions", June's statement that "John had a lot of answers on how to do a lot of the stuff" and Emma understanding that if she got stuck, she could "call on Chester, Joan, or whomever." Instructors, in these instances, were other students. Garrison and Archer (2000) noted that the role of instructor could shift to students in online learning.

Chester, who acknowledged having the greatest amount of time, was most likely to send messages giving hints and read messages for hints. He also found resolution to all of the problems. However June and Emma shared one area of difficulty for which a resolution was not found by either one of them. June quit working on the discussions when she got lost and she became discouraged with downloading difficulties with her older computer. Emma found that the messages lacked a linear logic, and she was surprised to find that there were still unread messages when she looked back at the discussion board after the course was finished. Both students also used descriptive terms for this area that were more emotional than those they used for any of the other problems, yet neither one of them requested information from the community of practice to help them through this.

Perhaps their hesitancy to refer to the community of practice in this regard resulted from exacerbating factors other than the new Vista™ site. Both found the number of postings required for them to read and submit created a burden because they found that their heavy workloads at their jobs competed for their time. June's computer

downloading difficulties also exacerbated this time management issue. These results are

in keeping with Conrad's (2002a) and Hill's (1999) results that included time

management issues and stresses when learners were assigned a participation grade.

Conclusions

The model represented by Figure 7 illustrates the interaction of all of the

components of this study, and demonstrates where learning about Vista™ was situated in

respect to this model.
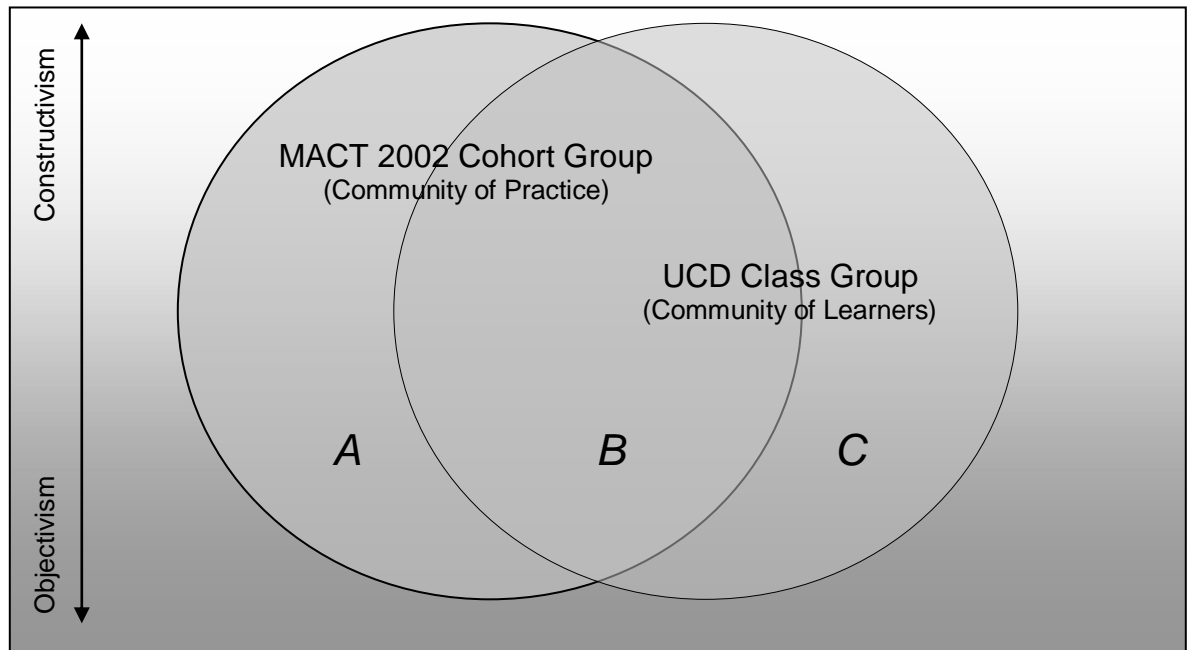
Figure 7: Representation of the interaction of all components of this case study

In this figure, the circle on the left represents the knowledge that the MACT 2002

cohort group possessed about the Vista™ interface used in accessing the UCD course by

the end of the course. The circle on the right represents the knowledge that the full UCD

class possessed about the functioning of Vista™ in this context. The rectangle that makes

up the field upon which these circles rest, represents the entire UCD online learning

context. The lighter area at the top of the figure indicates constructivist learning and the

darker area at the bottom indicates objectivist learning. The variegated area indicates that learning varies according to constructivist and objectivist strategies chosen by both students and the course designer (Vrasidas, 2000; Cole, 1992). The entire model thus represents how the MACT community of practice worked beside and with the rest of the students in the UCD course using the Vista™ interface.

The letters within areas of this diagram carry the following significance. *A* represents the knowledge that the MACT community of practice communicated regarding the interface. *B* represents discussions, group work, and exchanges accessed by everyone enrolled in the course. This includes all of the messages and information that all members of the class could access. *C* represents the knowledge possessed by the class members who were not part of the MACT group – knowledge that would not have been apparent to the MACT group. It is here that my own lack of vision manifests itself. Because the reactions of the community became such a strong focus for this project, I did not pursue obtaining information from non-MACT cohort classmates. Much like the participants whom I interviewed, I was blind to the fact that these individuals may have had knowledge that could have aided our community – or that they may have had need for some of the knowledge that the MACT subset constructed. Unfortunately the opportunity to obtain this information has now passed.

In the same way that the MACT community of practice was not aware of the information represented by *C*; the community of learners not in the MACT group was not aware of *A*. Furthermore, unless they also communicated with each other in private email, the UCD class members who were not part of the MACT community of practice were likely unaware of any other classmates' knowledge.

When focusing only on the functioning of the MACT subset in this case study, the results of this study did confirm that the students from this subset did act as a community of practice. These students preferred constructivist strategies when learning about the new Vista™ interface; however, they built in a system for using objectivist strategies through their functioning as a community of practice.

Final Thoughts

This case study reflects the observations of a participant observer in the context of a community of practice that made up only a portion of an online learning class experiencing a change in the technology that provided the interface for their learning experiences. Hopefully the insights offered by this work may be useful to those involved with the design and teaching of online courses, as well as those involved in the design of the technology that mediates these courses; and that these insights may help to enrich the experiences of the students affected by these people. As a result of writing this paper, I appreciate, more than before, that my own online learning experiences with the MACT 2002 cohort, have been enormously enriching and powerful. It is difficult to imagine that such learning could be even better; but I can see that it can be – when the powers of technology are truly aimed towards meeting the needs of learners who are learning how to learn.

Closing Vignette

During my work on this case study, I have been very conscious of its effect on how I view episodes in my teaching practice. Specifically, I have become more aware of what is happening when my students work in groups, or when members of the staff at my school collaborate.

For example, students in my grade eight language arts class have been exposed to many words that describe writing. Although their experiences with using this vocabulary included identifying pieces of writing as fables, biographies, stories, etc., I felt that their conceptualization of these terms was still quite superficial. After considering the power of communities of learning, I had students choose one or two other students with whom

to work, and then these small groups each chose one of the twelve terms listed on the board in order to create a poster and presentation on that term. Students were to include a definition for the term, examples from selections we had read, a list of characteristics of that type of writing, and an indication of what this term was, and what it was not. I explained to the class that, although they were concentrating on just one of the terms, their presentations to the class would allow classmates to expand on their posters by adding post it notes with their additional insights.

As students worked on their posters, exciting questions were discussed not only between the students directly involved but also with neighboring students with whom they shared markers. Questions included: How many pages does a novel have? What characteristics do timelines, web sites, and autobiographies have in common? Then, how are they different? Knowing that their charts would be edited by their classmates made them conscious of their spelling choices: How do you spell 'usually' they asked each other, before they came to me to confirm an answer.

During presentations, students were engaged in contributing to the posters because they understood that these posters would be taken to the computer lab, and they would act as reference material for the next step in this lesson. In this next step, each student would be creating an expandable cell chart that would summarize their knowledge of these terms. That chart would eventually become part of their notes, available to use when it comes time to review for final exams. Yes, they would be able to help each other with the technology that they would use to create these charts.

A discussion at the end of this exercise allowed students to reflect on their metacognition of the process of this knowledge construction.

What a remarkable difference this lesson is from the hours of note-taking and meaningless memorization that marked my own learning experiences in junior high! What a delightful experience it was to watch these students be so engaged in their learning!

Some of the headings that were required on these students' posters came from a share folder that has recently been placed on our school's server. My description of the success of this lesson will soon be shared with the people who access that server. I look forward to hearing my colleagues' accounts of their successes, too. We will also, likely engage in discussions of the problems that our shared practice present. Some of these will be in the form of "War" stories that we will laugh about because we recognize the situations so well.

By viewing my practice with an understanding of communities of practice and constructivist and objectivist strategies, I can see that my job of teaching is becoming transformed, and I love the exciting potential it promises.

References

Alberta Education. (2000). *Program of Studies for English Language Arts K-9.* Edmonton: Curriculum Standards Branch.

Alberta Education. *Program of Studies for Information and Communication Technology K-12.* Retrieved February 21, 2005 from http://www.education.gov.ab.ca/k_12/curriculum/bySubject/ict/

Aragon, S. E. (2003). Creating social presence in online environments. *New Directions for Adult and Continuing Education,* no. 100. 57-68. Retrieved February 28, 2005 from http://wilsontxt.hwwilson.com/pdfhtml/01517/AXVUK/USJ.htm

Blotcher, J. M., deMontes, L. Sujo, Tucker, G., and Willis, E. (2000). *Preparing teachers to integrate technology using constructionist methodology: Don't teach me how I know I should teach: Teach me how I want to be taught* (Report No. IR020715). East Lansing, MI: National Center for Research on Teacher Learning. (ERIC Document Reproduction Service No. ED455759)

Brown, J. & Duguid, P. (1991). Organizational learning and communities of practice: Toward a uniform view of working, learning and information. *Organization Science, 2*(1). 40 – 57.

Brown, R. E. (2001). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks, 5*(2). Retrieved February 28, 2005 from http://www.sloan-c.org/publications/jaln/v5n2_brown.asp

Bruner, J. S. (1986). *Actual minds, possible words.* Cambridge, MA: Harvard University Press.

Bruner, J. S. (1990). *Acts of meaning.* Cambridge, MA: Harvard University Press.

Bruner, J. S. (1996). *Toward a theory of instruction.* New York: W. W. Norton & Company, Inc.

Burch, R. (2000). An unseemly god: Some notes on the essence of micro-computer technology. Unpublished talk given at the University of Edinburgh, 1990; revised in 2000. Retrieved August 16, 2003 from http://phenomenologyonline.com/articles/burchmicro.html

Cain, D. L., Marrara, C., Pitre, P. E., & Armour, S. (2003). Support services that matter: An exploration of the experiences and needs of graduate students in a distance learning environment. *Journal of Distance Education, 18*(1). 42 – 56.

Campbell, Katy (2004). *What is User Centered Design* Edmonton, Alberta: University of Alberta, Faculty of Extension, Masters of Arts in Communication and Technology Teaching Note.

Cohen, D. & Prusak, L. (2001). *In good company; How social capital makes organizations work.* Boston: Harvard Business School Press.

Cole, Peggy. (1992). Constructivism revisited: A search for common ground. *Educational Technology, 32(2).* 27-34.

Conrad, Dianne (2002a). *Community, social presence and engagement in online learning.* Unpublished doctoral dissertation, University of Alberta, Alberta.

Conrad, Dianne (2002b). Deep in the hearts of learners: Insights into the nature of online community. Retrieved January 4, 2005 from http://cade.athabascau.ca/vol17.1conrad.html

Creswell, John W. (1998). *Qualitative inquiry and research design: Choosing among five traditions.* Thousand Oaks: Sage.

Dewey, J. (1897). My pedagogic creed. *The School Journal, LIV*(3). 77-80. Retrieved August 21, 2003 from http://www.infed.org/archieves/e-texts/e-dew-pc.htm

Gabriel, M. A. (2004). Learning together: Exploring group interactions online. *Journal of Distance Education, 19*(1). 54 – 72.

Garrison, D. R. (1993). A cognitive constructivist view of distance education: An analysis of teaching-learning assumptions. *Distance Education, 14*(2), 199 – 211.

Garrison & Archer (2000). *A transactional perspective on teaching and learning A framework for adult and higher education.* Amsterdam: Pergamon.

Gray, B. (2004). Informal learning in an online community of practice. *Journal of Distance Education, 19*(1). 20 – 35.

Guba, Egon G. & Lincoln, Yvonna S. (1994). Competing paradigms in qualitative research. In Norman K. Denzin & Yvonna S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks: Sage Publications.

Hill, Janet. (1999). Teaching technology: Implementing a problem-centered activity-based approach. *Journal of Research on Computing in Education, 31*(3), 261-280. Retrieved February 23, 2003 from Academic Search Premier database.

Hillman, D. C., Willis, D. J., & Gunawardena, C. N. (1994). Learner interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *The American Journal of Distance Education, 8*(2), 30 – 42.

Innis, Harold. (1972). *Empire and communications.* Toronto: University of Toronto Press.

Jonassen, David H. (1992). Evaluating constructivist learning. In T.M. Duffy & D.H. Janassen (Eds.), *Constructivism and the technology of instruction: A conversation.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Jonassen, David H. (1993). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14.

Jonassen, David H. (2000). Technology and constructivism. In M. Moore & N. Shin (Eds.), *Speaking personally about distance education: Foundations of contemporary practice*. University Park, PA: Pennsylvania State University.

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

Lieblich, Amia., Tuval-Mashiach, Rivka., & Zilber, Tamar. (1998) *Narrative research: Reading, analysis, and interpretation*. London, UK: Sage Publications.

Logan, R. K. (2000). *The sixth language:Learning a living in the Internet age.* Toronto: Stoddart Publishing.

Merriam, S. B. (1998). *Qualitative research and case study applications in education.* (2nd ed.) San Francisco: Jossey-Bass.

McLoughlin, C. (2000). Creating partnerships for generative learning and systemic change: Redefining academic roles and relationship in support of learning. *International Journal for Academic Development, 5*(2), 116 - 128. Retrieved January 23, 2003 from Educational Research Abstracts Database.

McLuhan, M. (1964). *Understanding media: Extensions of man* (2nd ed.). New York: Signet.

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education, 3*(2), 1-6.

Neuman, W. L. (2003). *Social research methods; Qualitative and quantitative approaches.* (5th ed.) Toronto: Allyn and Bacon.

Piaget, J. (1970). *Genetic epistemology.* New York: Columbia University Press.

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001). Assessing social presence in asynchronous text-based computer conferencing. Retrieved February 28, 2005 from http://cade.athabascau.ca/vol14.2/rourke_et_al.html

Schwandt, Thomas A. (1994). Constructivist, interpretivist approaches to human inquiry. In Norman K. Denzin & Yvonna S. Lincoln (Eds.), *Handbook of qualitative research* (pp.118-137). Thousand Oaks: Sage Publications.

Senge, Peter. (1999). It's the learning: The real lesson of the quality movement. *Journal for Quality and Participation, 22*(6). Retrieved May 22, 2003 from Academic Search Premier database.

Stake, Robert, E. (1994). Case studies. In Norman K. Denzin & Yvonna S. Lincoln (Eds.), *Handbook of qualitative research* (pp.236-247). Thousand Oaks: Sage Publications.

Stewart, Thomas A. (2001). *The wealth of knowledge; Intellectual capital and the twenty-first century organization.* New York: Doubleday.

Von Glaserfeld, E. (1991). Knowing without metaphysics: Aspects of the readical constructivist position. In F. Steier (Ed.) *Research and reflexivity* (pp. 12-29). Newbury Park, CA: Sage.

Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education. *International Journal of Educational Telecommunications, 6*(4). 339 – 362.

Vredenburg, K., Isensee S., & Righi, C. (2002). *User-centered design: An integrated approach.* Upper Saddle River, NJ: Prentice Hall.

Vygotsky, L. S. (1978). *Mind in society.* Cambridge MA: Harvard University Press.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity.* New York, NY: Cambridge University Press.

Wenger, E. (1999). Communities of practice and social learning systems. Retrieved January 28, 2005 from http://www.ewenger:com/pub/index.htm.

Wenger, E., & Snyder, W. (2000). Communities of practice: The organizational frontier. *Harvard Business Review,* January – February, 78(1), 139-145.

Whittle, J., Morgan, M. & Maltby, J. (2000). Higher learning online: Using constructivist principles to design asynchronous discussions. Retrieved March 15, 2003 from http://www.unb.ca/wwwdev/naweb2K/papers/whittle.htm.

Wiley, J. & Schooler, J. (2001). The mental web and pedagogical and cognitive implications of the net. In Christopher R. Wolfe (Ed.), *Learning and teaching on the world wide web* (pp. 243-257). New York: Academic Press.

Wright, K. (2001). *Communities of Practice.* Edmonton, Alberta: University of Alberta, Faculty of Extension, Masters of Arts in Communication and Technology Teaching Note.

Yin, Robert K. (1989). *Case study research: Design and methods.* London, UK: Sage Publications.

Appendix

Individual Interview Questions

Introduction to Interview:

"As I have previously explained, the purpose of this research project is to examine how a community of learners reacted to, and made sense of a significant change in the format of the electronic delivery of their instruction. This relates to your experiences when you encountered the new Webct format during one of the courses you completed for the partial fulfillment of your MACT degree.

You may, at any time, opt out without penalty and any collected data will then be withdrawn from the data base and not included in the study. Also, please understand that your anonymity, privacy, and confidentiality will be honoured throughout the research process including the production of the final project.

In order to keep an accurate record of your words, I will be recording the audio of our interview. I will also be taking some notes that will help me to orient myself as I review the recordings.

Are you ready to proceed at this time?"

Interview Questions:

1. Would you please explain the context in which you first encountered the new Webct format?

2. What were some of the challenges that you experienced as you used this new format?

3. For each of the challenges that you have indicated, please explain the following:

> **- How did you identify the difficulty? What was your reaction at this time?**

> **- How serious was this difficulty? Would you please explain why you feel this way?**

> **- What strategies did you use to overcome the difficulty?**

> **- To what degree was the difficulty resolved?**

Information/Consent Letter

64 Regal Way
Sherwood Park, Alberta
T8A 5V4

Dear _____:

In a recent conversation, you indicated that you would be willing to participate in research that I am conducting in partial fulfillment of the requirements of my Master of Arts in Communication and Technology (MACT) degree with the University of Alberta.

As explained in that conversation and in the information package you have received, this project will examine how the interaction within a community of learners provides support for its members when it encounters an unexpected, significant change in the electronic delivery of its instruction. This relates to your experiences when you encountered the new Webct format during one of the courses that you completed for the partial fulfillment of your MACT degree. An interview lasting about an hour will provide the basic data required for this study. A copy of the interview questions will be attached to this letter of consent. Aside from this initial interview, there may be an additional follow-up as described below.

At this time I would like to arrange a time and place that are convenient for you where I could conduct the initial interview. If a face-to-face interview session is too difficult to arrange due to your distant location, I would like to conduct this session via speaker-phone, at my expense. If follow-up should be required in order to clarify or confirm the content of a session, this will be done by telephone. The information gathered through these means will be extremely valuable in my research which will further the understanding of the challenges faced as well as strategies used by learners in situations of change in electronically transmitted formats.

I will ensure, to the best of my ability, that your information is kept private, confidential, and anonymous, and that only I will have access to this information. Should I require the assistance of an additional transcriber, that person would be required to sign a confidentiality agreement that also ensures the privacy of your contribution. You have the right to withdraw at any time, without prejudice to pre-existing entitlements, and to continuing and meaningful opportunities for deciding whether or not to continue to participate. You may, at any time, opt out without penalty and any collected data will then be withdrawn from the data base, and not included in the study. All information gathered from any interview will be kept in a secure location during the completion of the study, and it will be locked away for the 5 years required after the completion of the project. At that time, this information will be destroyed. At the completion of the paper, you will have the opportunity to read the results before final submission.

The sole purpose of the interview is to complete the requirements of my Master's project. This project will take on the format of a written, published report that will be presented to the MACT committee for approval and review. However, the information may appear in other forms at a later date, such as in a magazine or journal article. Please note that privacy, confidentiality and anonymity will continue.
Should you have any concerns, complaints or consequences at any time, I can be reached at the address shown above, by email at **ingec@shaw.ca** or **icoates@ualberta.ab.ca**, or by telephone at (780) 417-6961.

My project supervisor, Dr. Katy Campbell, may be reached as follows:
       Katy Campbell, PhD
       Associate Dean, Faculty of Extension, University of Alberta
       2-02 University Extension Centre
       University of Alberta
       8303 – 112 Street

    Edmonton, AB, Canada T6G 2T4
    Telephone (780) 492-1858

You may also contact Dr. Mike Enzle, Director of Human Research Protections Office at the Ethics Review Board as follows:
    Dr. Mike Enzle
    Director of Human Research Protections Office
    University of Alberta
    222 Campus Tower
    8625 – 112 Street NW
    Edmonton, AB, Canada T6G 2E1
    Telephone (780) 492-5265

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by the Faculties of Education and Extension Research Ethics Board (EE REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Chair of the EE REB at (780) 492-3751.

If you agree to the terms of this interview as outlined above, please sign and date this letter below. Thank you for your patience in contributing to this research.

Sincerely,

Inge Coates

I agree to Participate in this interview according to the terms outlined above.

_____
(Signed)   **(Date)**