WALKER, BRIAN K., Ph.D. Bridging the Distance: How Social Interaction, Presence, Social Presence, and Sense of Community Influence Student Learning Experiences in an Online Virtual Environment. (2007)
Directed by Dr. David F. Ayers and Dr. Sam Miller. 273 pp.

Online instruction has become part of the core of higher education and a voluminous literature has developed establishing that online instruction is just as effective as face-to-face learning. Simultaneously, however, pervasive reports of isolation and attrition among online learners, attributed to the presumed inability of online classes to support the substantive social interaction and sense of community among learners, have led some to conclude that online learning is not suitable for students who highly value interaction and who cannot function well independently. This study, however, explores how innovations in online instructional media and design may heighten interaction and community building among online learners.

This study examines how the use of an online virtual environment impacts on student learning experiences in terms of four constructs: Presence, social presence, social interaction, and sense of community. During this ethnography, the online class proceedings of four hybrid classes were observed over the course of three academic terms. The transcripts of the proceedings, some conducted in the virtual environment and some in an asynchronous discussion forum, were subjected to content analysis to examine how the constructs manifested themselves in the virtual environment, how the environment impacted on their manifestation, how they mutually influenced one another, and how they mutually impacted upon student learning experiences. In addition, the researcher conducted interview and focus group sessions with key informants.

The results indicated that the MOO demonstrated stronger manifestations of the constructs than did Blackboard, primarily due to the fast-paced, synchronous exchanges and the ability to display slides which the MOO supported but Blackboard could not. The results suggested that the presence and social presence supported by the MOO promoted the growth of social interaction in both forums which, in turn, promoted the development of sense of community among learners which minimized students' sense of isolation and combated attrition. However, the results also established that the use of the virtual environment was not a panacea, and that the manifestation of the constructs was also dependent upon the pedagogy and degree of involvement and investment in the online forum of both the instructor and the students.

BRIDGING THE DISTANCE: HOW SOCIAL INTERACTION, PRESENCE, SOCIAL PRESENCE, AND SENSE OF COMMUNITY INFLUENCE STUDENT LEARNING EXPERIENCES IN AN ONLINE VIRTUAL ENVIRONMENT

by

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A Dissertation Submitted to
The Faculty of the Graduate School at
The University of North Carolina at Greensboro
In Partial Fulfillment
Of the Requirements for the Degree
Doctor of Philosophy

Greensboro
2007

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To Wendy and Hailey without whose support this would not have been possible.

APPROVAL PAGE

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__October 29, 2007_____
Date of Acceptance by Committee

__October 29, 2007_____
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CHAPTER I

INTRODUCTION

The Growth and Context of Online Learning

Over the course of the last fifteen years, institutional higher education has seen a dramatic expansion of instructional delivery through online distance learning. While distance learning programs have been in existence in the United States since the 1800s (McGorry, 2003), the development of Internet-based media for communication and the dissemination of information has created a fertile ground for the seemingly exponential growth of online distance learning course offerings, programs, and enrollments at colleges and universities all over the nation and the world. According to the National Center for Educational Statistics (NCES), 33% of two and four-year degree-granting colleges and universities offered distance education courses in 1995. Two years later that number had increased to 44% with an additional 20% of institutions reporting that they planned to start offering distance educational courses by the year 2000. Yet at the eve of the new millennium student enrollments in distance education courses were still relatively low, with 8% of undergraduates and 10% of graduate/professional students reporting taking distance education courses, primarily via the Internet (Sikora & Carroll, 2002). Still, the upward trend continued and in the very next academic year 56% of these same institutions were offering distance education courses for college credit, again primarily via online media (Waits and Lewis, 2003).

Over the period from 2002 through 2004, student enrollments in online courses grew by almost 20% per year, far outpacing overall higher educational enrollment growth. By 2004 2.35 million students were enrolled in online college or university classes and roughly 65% of schools offering undergraduate or graduate face-to-face courses also offered online courses for undergraduate or graduate credit. If one excludes institutions with enrollments under 3,000 these percentages are even higher. For instance, among institutions offering undergraduate-level courses with enrollments of 7500-14999 students, almost 90% also offered online undergraduate-level courses in 2004. Among institutions with enrollments in excess of 7500 offering graduate-level courses, over 84% also offered online graduate-level courses in 2004. Over this same time period, not only were institutions offering increasing numbers of online courses, but they were also expanding the number of certification and degree programs that were offered entirely online. In 2004, for example, 44% of schools offering face-to-face master's degree programs also offered master's programs online. Likewise, 40% of schools offering face-to-face associate's degree programs also offered associate's degree programs online. In addition, numerous private, for-profit institutions have arisen in the last fifteen to twenty years which offer all of their certification and degree programs exclusively online. These numbers, according to their publisher, the Sloan Consortium (2005), indicate that online learning has not only become pervasive within the Academy but that it has penetrated the core of undergraduate and graduate instruction, rather than being relegated to the fringes of "continuing education."

The rapid growth of online instruction within higher education has not occurred in a vacuum, and both advocates and critics point to numerous factors within and without the Academy that have promoted and shaped the online boom. Over the last half century, significant changes have taken place within American society. The economy has begun to lose some of its manufacturing base in exchange for growth in service and knowledge-based fields. The demographics of the student body have changed, with increases in traditional enrollments supplemented by increasing numbers of adult learners wishing to further their education even while working full time jobs and raising a family (Merriam & Caffarella, 1999). As these elements of American society have been changing, so too has the socio-political environment in which higher educational institutions operate and the manner in which post-secondary education is perceived. Now more than ever, Americans see a college education and degree in terms of its vocational application. A college degree is seen as the ticket into a better-paying job in the new knowledge economy and a ticket out of the vanishing world of the manufacturing economy. This emphasis on the practical applications of a college education has manifested itself in two primary ways, both of which have had an influence on the growth of online learning: A tightening of the bonds between institutional higher education and corporate America, and increasing demands from the public and its governments for efficiencies, measurable results, and accountability from colleges and universities (Burke, 2004).

The last three decades have seen a coming together of American higher educational institutions and the private, corporate sector in the United States. One manifestation of this merging has been the increasing presence within traditional higher

education of concepts and language from the private corporate sector. In this environment, learning and degrees are characterized as a "product" or "service" and students are seen and described as "consumers" to whom the educational goods of colleges and universities are marketed. As such, colleges and universities have experienced a shift from a world in which a quality education was defined exclusively by the institution (namely, the faculty, administration, and governing entities) to one in which the interests of students and the organizations that want to hire them play a much larger role in shaping curriculum and programs (Burke, 2004). This new environment now commonly prompts higher educational institutions at all levels, from elite professional schools to community colleges, to tailor their academic programs to meet the expressed needs of corporate entities. Perhaps now more than ever the mantra of colleges and universities appears to be "readying tomorrow's workers for the information economy," an emphasis which some observers see as beneficial and inevitable while others view as an excessive leaning toward vocational skills at the expense of the overall quality of higher education (National Research Council, 2000). A brief survey of the literature on online learning quickly reveals how pervasive the language and concepts of this environment have been in prompting and supporting the growth of online course and program offerings from colleges and universities. One representative example comes from MacDonald and her colleagues (2001) who say,

> That the university consumer is changing, driven by forces of our knowledge-based economy, suggests that there is an opportunity to develop and deliver courses and programmes that will attract adult learners whose needs are not currently well served by postsecondary education. Competition between private industry and postsecondary

> institutions can and must coexist to meet the increasing demands of adult learning. The key to achieving successful educational programmes consists in determining the needs and wants of target markets and delivering more effectively and efficiently than competitors. (p. 11)

Both critics and advocates of online learning agree that the introduction of these "market" influences, referred to by some as the "commodification" or "corporatization" of higher learning, has served not only to push traditional colleges and universities into the online learning arena but has also given rise to the "competitors" referred to by MacDonald and her colleagues, above. Private, accredited post-secondary learning entities such as the University of Phoenix Online and Strayer University market their fully-online baccalaureate, graduate, and professional degree programs to working, adult learners, potentially drawing these learners away from traditional institutions.

Another element of the current climate that has promoted the growth of online learning has been the push to "reform" education at all levels not only from "consumers" but also from their governments. Public institutions have seen legislative mandates for accountability and quantifiable results, coupled with diminishing revenues and increasing enrollments (Burke, 2004; Grantham, 1999). Public universities in South Carolina, for instance, are assigned a numerical effectiveness rating by that state's Commission on Higher Education at the end of each academic year, and each school's funding is impacted by how well it meets its "benchmark" scores. This "performance-based funding" system, and those like it in other states, rate schools along numerous factors from entrance requirements to quality of the faculty. When South Carolina's system was founded in 1996, the quality of the students receiving degrees from each institution was

measured in terms of such constructs as “Employment rates of graduates,” and “employer feedback on graduates” which included employer satisfaction scores for graduates hired. While South Carolina has since modified its definitions of the “student achievements” category, the theme of practical efficiency and usefulness to the business community is still evident in such systems (South Carolina Commission on Higher Education, 2005).

Advocates for such performance-based funding systems say that they promote the efficient use of public revenues through such innovations as the expansion of online instructional programming, thereby improving the quality of the higher educational product and operation (Burke, 2004). Critics, however, argue that pay-for performance, coupled with the existing market forces and corporate influences described above, are pushing institutions of higher learning toward implementing policies and programs that comply with agendas that may be out of touch with their traditional mission of providing a quality education to students, and that the expansion of online programs may be just such an “out of touch” policy (Grineski, 1999).

It is no wonder that in an environment where institutions of higher learning have been facing pressure from several quarters to become more relevant, marketable, efficient, and accountable, that colleges and universities would turn to technology for solutions. American culture has long been characterized by the rapid expanse and influence of technology, coupled with the sense that technology can solve societal problems and make life better for everyone. From the automobile and the television to the computer and the cellular telephone, Americans have quickly embraced technological innovation and cast sometimes excessive expectations upon the benefits of new

technologies (Cadello, 1998; Segal, 1985). Indeed, the Internet is not the first new technology to which institutional education has looked for revitalization. Cuban (1986) notes several points in American history where a newly introduced technology was expected to revolutionize education, such as the radio, the motion picture, television, and the computer. The following quotes are emblematic of the promise people have traditionally placed on emerging technologies:

Thomas Edison (1922): "I believe that the motion picture is destined to revolutionize our educational system and that in a few years it will supplant largely, if not entirely, the use of textbooks" (Cuban, 1986, p. 9).

Benjamin Darrow (1932): "The central and dominant aim of education by radio is to bring the world to the classroom, to make universally available the services of the finest teachers . . . " (Cuban, 1986, p. 19).

William Levenson (1945): "The time may come when a portable radio will be as common in the classroom as is the blackboard" (Cuban, 1986, p. 19).

These quotes serve as reminders that the promise of new technology is not always borne out, at least in terms of its impact on education, even though each of these technologies has certainly had enormous impact on society at large. A similar pattern can be seen with the advent of computers and the Internet in the latter part of the 20th century. Not since the arrival of the radio, telephone, and television has an information and communication technology been so influential in shaping how people communicate with one another and how organizations communicate and conduct transactions with their clients, customers, and constituents. Corporate America quickly adopted the Internet as

the “next big thing,” leading to what has come to be called the “dot com boom” in the 1990’s. With Corporate America already online, and with the same technology culture preaching that the Internet could make students learn better, and could provide access to information and learning for those who have not had access in the past, institutions of higher learning felt enormous pressure to get on the high tech, online train or be left behind (Grineski, 1999).

In this environment, online learning has advanced from a peripheral endeavor to a central component of much of institutional higher education, with advocates trumpeting the practicality, convenience, and access provided by this application of advancing technology toward the business of education. Through online courses and degree programs, say proponents, students can pursue degrees who are unable to access the traditional classroom because of geographic barriers or because work and family obligations prevent it (Beard, Harper, & Riley, 2004; Yatrakis & Simon, 2002; Bocchi, Eastman, & Swift, 2004; Newman, Callahan, & Gallagher, 2002; Kaplan, 1999). The online learning boom has not been without its critics, however, as colleges and universities have collectively leapt onto the online bandwagon. While the concepts of organizational renewal call for colleges and universities to modify their programs to keep in touch with the needs of their target publics, most theoreticians view this process as initiated by the higher educational institution from within (Boone, Safrit, & Jones, 2002). Critics have questioned the wisdom of the online boom based on concerns that it has been driven more by market forces than by reasoned concern for teaching and learning. More specifically, concerned scholars have primarily questioned the quality of online classes

and whether students in those classes learn as effectively as students in traditional classes. In addition, those concerned over the rapid advance of online learning have questioned the values and theory behind the Internet university boom and the degree to which these rapidly expanding endeavors are consistent with the mission of traditional higher education. Somewhat after the fact, researchers began investigating whether online learning lives up to its claims, how it compares to traditional instruction, and how innovation and sound theory could be applied online to maximize and validate this form of instruction.

The No Significant Difference Literature

As the educational research community began to address the online learning movement, the first and most common question was that of how the new online classes compared with traditional, face-to-face classes. Were online courses as good as their traditional counterparts, and if not, how were they different? In an attempt to answer questions in this vein, hundreds of studies were conducted and published between the mid 1980's and 2005 which compared online courses to traditional courses in terms of a plethora of educational constructs, and the vast majority of these studies purported to have found no significant difference between course formats. In recent years, this so called "no significant difference" literature has been compiled and the subject of numerous meta-analyses, all yielding the same, essential results: Online classes are just as effective as face-to-face classes at educating students. Although some analysts have pointed out that some of the studies comprising this literature are flawed in their design, the overwhelming majority of the remaining studies clearly supports the notion that

students in online classes learn just as well as students in traditional classes (Russell, 1999; Phipps & Merisotis, 1999; Hanson, Maushak, Schlosser, Anderson, Sorenson, & Simonson, 1997; Bernard, Lou, Abrami, Wozney, Borokhovski, Wallet, Wade & Fisset, 2003; Joy & Garcia, 2000; McDonald, 2002; Wegner, Holloway & Garton, 1999; McKissack, 1997; Szulc, 1999; Ryan, 2000; Gagne & Shepherd, 2001). Hundreds of such studies can be found at www.nosignificantdifference.org, the website that serves as a companion to Russell's (1999) seminal work on the subject. Many studies and meta-analyses (many of which are also available for review at the website) have gone even further, concluding based on their comparison results that online classes offer an instructional experience that not only rivals face-to-face (f2f) classes, but that actually surpasses the traditional format in terms of teaching effectiveness (Shachar & Neumann, 2003; Olson & Wisher, 2002). Were effectiveness the only quality measure of a classroom experience, then the No Significant Difference literature might have silenced the critics and settled the question of the place of online instruction in the educational landscape. However, this has not been the case.

Isolation, Attrition, and Online Learning as Not For Everyone

Ironically, the same body of literature that has quelled concerns about the pedagogical value of online instruction has served to identify several phenomena that have raised new concerns. For example, a great many of the no-significant-difference (NSD) studies have noted that despite the lack of a statistically significant difference between online and f2f students in their primary effectiveness measure, the online students routinely report a sense of isolation or disconnectedness from their instructors

and fellow students (Hiltz, 1998b; Valenta, Therriault, Dieter, & Mrtek, 2001; Eastmond, 1995; Kerka, 1996, Besser & Donahue, 1996; Twigg, 1997; Ashar & Skeenes, 1993; Bessemer & Donahue, 1996). This isolation phenomenon has been so pervasive among online learners that it has prompted many researchers to conclude that online learning is simply incapable of supporting the kinds of interaction and community building normally found in traditional classrooms. Additionally, and relatedly, the participants, instructors, and researchers cited in the NSD literature have consistently reported that online classes tend to require more independent work than do traditional courses. The reduction or absence of support structures, such as are commonly found in classes that regularly meet face to face, requires students in online courses to self-regulate their learning more than they would in a traditional class in order to succeed. This means that students must schedule and engage in course activities, such as reading and posting to discussion boards, without instructor prompting (Waschull, 2005; Aragon, 2003; Parry & Dunn, 2000).

The fact that the convenience and flexibility of online learning appears to come at a cost of a sense of isolation and an increased demand for independent work, while a concern for some educational researchers, has not raised alarms on a broader scale. This should come as no surprise given another element of American culture that has served as part of the context for the growth of online learning: The ever-present emphasis on the individual and independence over community and interdependence. Two values that play a prominent role within American culture are individualism (a social philosophy which emphasizes the primary importance of the individual and the virtue of personal

independence) and self-sufficiency (the state of not requiring outside aid or interaction to survive or succeed) (Bellah, 1986). While the centrality of individualism to American society has been argued since the time of de Toqueville, some contend that our individualistic tendencies have increased over the course of the last century (Kemmelmeier, 2003). In this environment, colleges and universities began offering increasing numbers of classes where students performed most, if not all, of their assigned academic tasks while physically separated from their classmates (in many cases, never meeting their peers or instructor face to face) and where their only interaction with the instructor and other students came in the form of asynchronous text messages (email, listserv, or discussion board postings). The perceived separation and lack of interaction has been considered by most observers as a fair concession in return for the convenience of anytime, anywhere learning that the growing student population has demanded (Shin, 2002). However, the impact of the isolation and independence characteristic of online learning may not be without consequence.

One other common and well-documented finding from the NSD literature that has raised considerable concern is that attrition rates are consistently higher in online courses than in their traditional counterparts, prompting many researchers to question why students are less likely to persist in the online environment (Morgan & Tamm, 1999). Not surprisingly, several studies investigating this phenomenon have posited a link between the sense of isolation and increased need for independent learning commonly associated with online classes and these higher attrition rates for online learners. Researchers have hypothesized that students who place a high value on human contact

and/or who do not have the self-regulation skills to function in an independent learning environment find the online format more challenging than the traditional classroom and are more likely to withdraw from an online class (Rovai, 2002a). Over time, the persistent concurrence of these phenomena has led many researchers and institutions to conclude that online learning simply is not for everyone and that some students (namely, those who value human interactions and who do not function well independently) would be better served to avoid online classes. Some institutions have developed and begun employing survey instruments to test a student's compatibility with online classes, measuring such things as a student's need for interaction with others and with their instructor (Bernard, Brauer, Abrami & Surkes, 2004; Martinez, 1998). Those students whose responses indicate a strong need for interaction and close contact with students and their instructor are cautioned against enrolling in an online class. Some have even gone so far as to suggest that, because of their increased need for interaction, women are less well suited for online learning than are men (Bocchi, Eastman, & Swift, 2004). In essence, the same literature that has established the effectiveness of online classes has also led to the conceptualization of students as falling into two broad categories, those who can succeed online and migrate towards online courses (online students) and those that cannot and who tend to prefer face-to-face courses (traditional students). Given the increase in access which proponents in online learning cite as a benefit to the online boom, this dichotomy and the concept that online learning is not for everyone is problematic, especially given one final element of American society that frames the

online learning boom: The context of unequal access to higher education that has pervaded our national history.

Though some might argue that American society has come a long way toward leveling the playing field for people of all ethnic and socio-economic stratifications, others would counter that inequity is alive and well in the 21st century here in the United States. Data do exist to suggest that the gap between the wealthy and the poor in America has widened (Grier, 2005; Strope, 2004), and data and examples abound to confirm that racism and sexism are alive and well in the USA (Adams, Blumenfeld, Castaneda, Hackman, Peters, and Zuniga, 2000). In this environment, the general concept of equal opportunity, and its more specific correlate - equal access to education – are exposed as exaggerated at best and myth at worst (Gorski & Clark, 2002; 2003). One manifestation of these inequities that applies directly to the online boom is the ever-present set of barriers to higher education experienced by some racial, ethnic, and socio-economic groups (Greenberg, 2003; Long, 2003). Another relevant aspect of this cultural element is the so called "digital divide," which is the disparately diminished degree to which traditionally marginalized peoples within American society have access to computers and the Internet when compared with the majority, mainstream population (NTIA, 2000; Salter, 2001).

In the American socio-political context where higher educational opportunities are still relatively hard to come by for members of traditionally marginalized groups and where some groups (such as women) have gained access to many colleges and universities only within the last half century, this kind of argument that "online learning

isn't for everyone" sounds all too familiar. Critics have not missed the irony of how a movement justified in part by claims of expanding access has been bolstered by a plethora of studies whose findings say online classes are "just as effective" as traditional instruction, but only for some kinds of students. The fact that students enrolling in these classes who do not meet the "online pedigree" are less likely to succeed and less likely to persist suggests that the much touted "access" afforded by "anytime anywhere" learning is only for some. To critics, this situation is untenable and bears further examination. Fortunately, a number of researchers have begun to go beyond the questions of the No Significant Difference literature, beyond simply comparing the effectiveness of online learning with its traditional counterpart, and have begun to challenge the image of online learning as efficient and convenient but at a cost of being isolating. Several recent lines of research in online learning and related fields have yielded indications that the acceptance of isolation and an emphasis on independence as necessary evils of online learning may be premature. Researchers exploring the phenomena of interaction, sense of community, and social presence have raised the possibility that online learning may be more capable of supporting learning for all kinds of students than was previously thought.

The Role of Interaction

Historically, educational researchers and practitioners have recognized the significant role that interaction among class participants plays in the educational process (Anderson, 2002). Of more recent focus in the educational research literature has been the role and extent of interaction in online learning. Numerous studies have noted that interaction, or students' perception of interaction within an online course, has an impact

on student outcomes and attitudes about their learning (Swan, 2001; Valenta, Therriault, Dieter, & Mrtek, 2001). In light of these findings, the initial debate within the educational research literature, mirroring the overall theme of the No Significant Difference literature, concerned whether online courses are capable of supporting interaction that is comparable to that of traditional courses. On the one hand were researchers arguing that online learning media offer interaction opportunities that are rich and meaningful to students (Oren, Mioduser, & Nachimias, 2002; Anderson, 2002; Walther, 1992; 1995; 1996; Walther & Burgoon, 1992). On the other hand, however, the early predominant position of the educational research community was that text-based online forums were not capable of supporting educational interactions as well as traditional, face-to-face classes (Beard, Harper & Riley, 2004; Simmons, Jones, Jr., & Silver, 2004). As this debate has evolved, a dichotomy has emerged within the literature between interaction for purely academic or content-specific purposes, commonly referred to as "discussion," and non-content or "social" interaction (Swan, 2001). A closer examination of the literature reveals relatively broad support for the concept that online academic discussions are just as effective, if not more effective than their traditional counterparts. The jury is still out with regard to social interaction, however.

Focusing on the issue of whether online media could support content-related interactions as well as traditional classes, numerous studies in the no significant difference literature have compared online class discussions to those in face-to-face classrooms as a subset of the overall effectiveness comparison genre. These studies have largely concluded that online discussions promote critical thinking, egalitarian

participation, and contributions from students who would be less likely to speak up in a face-to-face class. Many of these studies have specifically examined the manner in which the student discussions in online classes promote constructivist modes of learning, namely collaborative, situated and active learning (Murphy & Cifuentes, 2001). The consensus, while somewhat mixed (see Swan, 2001 for information about the shortcomings of online discussions in promoting collaborative learning) is essentially that online class interactions are as good as if not better than those of face-to-face courses in promoting constructivist learning (Murphy & Cifuentes, 2001). Yet if online interactions are so effective at facilitating the construction of knowledge among students, then what may they be lacking that yields the sense of isolation that is so commonly reported in the literature? What is their deficiency that prompts many institutions to warn away students who report a high need for interaction with their peers and instructor? The answer may lie in a second and less academic purpose for interactions among class participants: The formation of social bonds.

Researchers in the fields of psychology and sociology have long pointed to the role of social relationships in human health and well being (Haines, Hurlbert & Beggs, 1996; Haines & Hurlbert, 1992). Applying this concept to education, researchers exploring the phenomenon of student attrition in online classes have argued that the isolation and the absence of external support structures in such classes may adversely impact some students' level of intrinsic motivation toward the course (Valenta, Therriault, Dieter & Mrtek, 2001; Ludwig-Hardman & Dunlap, 2003; Kember, 1989). Theories of student motivation, such as self-determination theory, support this notion that

human interaction, or a lack thereof, may play a significant role in the degree to which students are motivated to learn. Self-determination theory is a conceptualization of intrinsic motivation based around the concept that people have three innate, psychological needs: Competence, autonomy, and relatedness. Activities and environments that foster and promote the meeting of those needs are intrinsically motivating to people, who will tend to engage in them even in the absence of external controlling forces (hence, these behaviors are self-determined) (Ryan & Deci, 2000; Brophy, 1998). The third of these psychological needs, relatedness, is the innate need to form social connections with others such that one develops a sense of security and belonging. According to this theory, then, environments and activities that facilitate the meeting of this social connection need are intrinsically motivating to students, while activities that inhibit relatedness have the opposite effect (LaGuardia & Ryan, 2003; Baumeister & Leary, 1995). As Brophy (1998) puts it,

> People are inherently motivated to feel connected to others within a social milieu . . . Students are likely to experience intrinsic motivation in classrooms that support satisfaction of these . . . relatedness needs. Where such support is lacking, students will feel controlled rather than self-determined, and their motivation will be primarily extrinsic rather than intrinsic. (p. 7)

In the online learning environment where many students feel that they are more or less out there on their own, self-determination theorists would argue that learners are not having their need for relatedness fulfilled and that this deficiency may have an adverse impact on their motivation to participate in online learning. This reduction or absence of

intrinsic motivation to learn in the online setting could account for the relatively high rates of attrition reported in the online learning literature.

In recent years, research into online learning has begun to move beyond comparisons of online classes and online discussions to their traditional counterparts simply in terms of their academic effectiveness. Rather, perhaps in recognition of the importance of those issues raised in the literature on motivation to learn, an increasing number of studies have begun to focus on the social aspects of interactions among participants in online courses and the impact that these social dimensions can have upon student learning experiences. Researchers have concluded based on their examinations of both traditional and online courses that social interactions and relationship building are essential elements of classroom learning which distinguish educational experiences from merely informational ones (Thompson & McGrath, 1999; Wegerif, 1998). Also, several researchers have concluded, based on their observations of online classes, that despite the limitations commonly associated with Internet-based communication media, the online educational setting is capable of promoting social interactions among class participants (Oren, Mioduser, & Nachmias, 2002; O'Day, Bobrow & Shirley, 1998; Jacobson, 2001; Looi & Ang, 2000). So accepted has the notion of the value of interaction in online learning become that numerous well-regarded rubrics designed to assure quality in online classes now include an interaction component (Roblyer & Wiencke, 2003; California State University, Chico, 2003; Monterey Institute for Technology and Education, 2003; Keinath & Blicker, 2003). For example, the Peer Course Review Rubric developed by Quality Matters of the University of Maryland (2005) includes a review category called

"learner interaction" which says in its general standard, "The effective design of instructor-student interaction, meaningful student cooperation, and student-content interaction is essential to student motivation, intellectual commitment and personal development." But what is it about social interaction that provides motivation to students, the presence of which satisfies their need for relatedness and the absence of which yields a sense of isolation? As this line of inquiry has developed, some researchers have begun to focus on the concept of classroom learning communities and to theorize that the element which social interaction builds and which students find lacking in many online classes is a sense of community, a construct which encompasses not only a connection among students, but the perception that one is part of a group.

Sense of Community

In its simplest meaning, a sense of community is conceptualized as the opposite of the sense of being "out there on your own" that has so long typified online education. Sense of community is the perception that one is a part of a group with shared values, mutual interdependence, and concern for one another's well being (McMillan & Chavis, 1986). Students with a strong sense of community feel connected to one another as opposed to isolated from one another, as has often been the experience of online learners. In turn, students with a strong sense of community are more likely to persist and succeed in an online course than students who feel isolated and feel that they must be completely self-reliant (Ashar & Skeenes, 1993). Scholars studying the impact of sense of community on student learning experiences have argued that this one factor is at least as important, if not more important, than pedagogical quality in online course design

because sense of community is the element that ultimately "attracts and retains learners" (Rovai, 2002, p. 199). Worded another way, and drawing from the literature on motivation to learn, cited above, these researchers might argue that an online course design rich in academic tasks and opportunities for collaboration which are consistent with constructivist learning theory can only be said to provide the capacity for student learning. For this capacity to become reality, students must be motivated to fully invest themselves in these activities through the inclusion of design elements that promote the development of a sense of community (Rovai, 2002a).

The literature on the use of Internet media for higher education contains numerous examples of studies in which researchers have extolled the social nature of online interactive media. Embedded among the plethora of articles and opinions seemingly cementing the notion that online media were inherently impersonal and isolating have been articles by online instructors describing how they witnessed genuine social interaction among their students through listservs, email, and asynchronous discussion forum transactions (Thompson & McGrath, 1999; Wegerif, 1998; Oren, Mioduser & Nachmias, 2002; Brown, 2001; Rovai, 2002a; Haythornthwaite, Kazmer Guziec, Robins, & Shoemaker, 2000). With these findings in hand, researchers studying the social aspects of online learning have focused their attention on the constructs of community and sense of community in online courses, examining the characteristics of community, how learners develop a sense of community in online courses, and the impact that a sense of community has on learning experiences (Rovai, 2002a). In defining the concept of community and identifying its components, online learning researchers have turned to

literature from traditional educational research (in which learning communities have long been a subject of inquiry) and from the fields of psychology and sociology. Essentially, a community is defined as a group of people characterized by "mutual interdependence among members, connectedness, interactivity, overlapping histories among members, spirit, trust, common expectations, and shared values and beliefs" (Rovai, 2002a, p. 42). Correspondingly, sense of community is the perception by members of a group that the group demonstrates the characteristics of a community just described (McMillan & Chavis, 1986; Brown, 2001).

Results from early research into the impact of sense of community in online learning have indicated that online courses are capable of creating sense of community among participants that rivals traditional courses and has a positive association with student perceptions of learning (Rovai & Jordan, 2004). However, the same material also indicates that sense of community in online courses can be significantly lower than that found in traditional classes, which has prompted researchers to explore the factors that contribute to sense of community among learners (Rovai & Lucking, 2003). Through literature review in the area of classroom community formation and through examining student behavior in actual classroom settings, researchers have identified numerous factors and processes through which class participants develop a sense of community. In general, the literature identifies three categories of factors that are positive correlates to sense of community. The first includes elements of the instructional design such as the academic tasks and pedagogy employed, the technological media utilized, class size, and the degree to which these promote equal participation, social interaction, constructivist

collaboration, and structure (Rovai, 2002c). Additionally, several instructor-related factors play a role, such as modeling the interactive and collaborative behavior expected of students, creating a class atmosphere that promotes trust, respect and oneness, and providing timely feedback to students. The final category includes student-centered factors such as time available to devote to class activities, level of skill with technology, and student learning style (as it matches with the instructor's teaching style and course design) (Brown, 2001).

A natural progression from the identification of factors related to sense of community has been the development of instruments to measure the occurrence and strength of sense of community in actual classroom settings, both traditional and online. Rovai (2002a, 2002b, 2002c) has developed and validated such an instrument: The Classroom Community Scale. Consisting of twenty items, ten of which relate to feelings of connectedness and the remaining ten of which focus on student feelings about the use of interaction and their overall goal satisfaction within the course, the Scale has been utilized by Rovai and his colleagues to perform group comparisons between students in online and traditional class settings. The results of these comparative studies have indicated that online courses or blended classes (that mix online and traditional components) can foster the development of a sense of community among learners that rivals face-to-face classes. As with the no significant difference literature, however, some have argued that simple comparisons between online and traditional modes of teaching with respect to their ability to promote sense of community is not enough. Rather than asking whether online courses can rival their traditional counterparts,

researchers should be inquiring into how online courses can be designed and implemented so as to maximize the development of a sense of community among learners and to, thereby, reduce the isolation that adversely impacts upon student motivation and prompts many online students to withdraw (Weigel, 2000; McDonald, 2002). Based on the material reviewed thus far, one potentially vital element of online course design and implementation that may impact on sense of community is the online medium or media through which the class is conducted and through which the students interact.

The Impact of Media

As one reviews the vast body of no significant difference studies, one discovers that the majority of these studies focus on asynchronous discussion forums (discussion boards, email and listservs) as the standard medium for online classes and for online student interaction. This is not surprising, given that these media were the first to become widely available and were, therefore, the first to be commonly utilized as online learning platforms. By the turn of the new millennium, the asynchronous discussion board had become cemented as the bread and butter of Internet-based educational communications, and most research efforts into the effectiveness of online learning presupposed this medium as the standard for online educational delivery. Entire journals (for instance, the *Journal of Asynchronous Learning Networks*) have been established to study the use of these media for educational purposes. However, in recent years, a movement within traditional classroom settings to examine the impact of the physical classroom environment on learning has carried over to the online setting, prompting

researchers to ponder the effects that different online environments might have on student learning experiences (Graetz & Goliber, 2002). Researchers examining the role that the learning space has in shaping student learning experiences have determined that variations in the physical classroom setting can have a significant impact on student learning experiences and the overall effectiveness of the class (Van Note Chism & Bickford, 2002). As Graetz and Goliber (2002) put it, "The notion that meaningful and efficient collaboration can occur anywhere ignores the important role of the physical environment in shaping human social interaction" (p. 13). Jamieson (2003) agrees, saying "the 'place' of teaching and learning plays a vital role in how the process is experienced by the participants" (p. 121). He adds,

> As recognition grows for the idea that knowledge and skills develop through, and exist on, a collective, social level and not just within the individual, university campuses will need to provide spaces that facilitate the formation of communities of common interest and enable greater communication, interaction, and collaboration. (p. 122)

Jamieson goes on to suggest that instructional designers consider the use of spaces that are versatile, supporting both formal and informal interactions, and allowing for multiple modes of information transmission. Jamieson also suggests that University campuses include learning spaces that are also social spaces, places where social engagement and interaction are supported. Most notable, however, is the fact that Jamieson argues that these considerations apply to online learning settings just as well as to physical settings, and other researchers are likewise beginning to note the value of innovating in online learning environments. Just as physical campuses are going beyond the venerable

lecture hall to more versatile and collaborative spaces, online course designers are experimenting with deviations from the standard asynchronous forum in an attempt to maximize social contact and learning experiences (Skill & Young, 2002).

In the last decade, researchers and educators have witnessed the development of a number of new online interactive media and have applied to the practice of online teaching both these new media and also some previously existing media that were not originally created with learning in mind. Some examples of the former include IRC chat, instant messaging, collaborative gaming software, and virtual reality software, which are computer applications that emulate real spaces. Newer virtual reality software applications, such as Second Life, use 3-D graphics to visually simulate physical spaces. Some of them also employ full-body input devices (such as gloves and boots) to completely immerse the user in the computer-generated world. Some examples of older software applications that have been employed in online learning are MUDs (Multi User Domains) and MOOs (MUD, Object Oriented). These programs were originally designed as text-based virtual worlds in which people could meet online and play role-playing games. In the last decade, however, several educational organizations and institutions of higher learning have begun using these simple, text-based environments as online classrooms (for a comprehensive list of educational MOOs, visit http://lingua.utdallas.edu/encore/moos.html). In each instance, one of the primary reasons cited for the exploration of these alternative media for online teaching and learning is to break out of the mold of the standard approaches and see how learning changes. As Cynthia Haynes (2001), an advocate for the use of educational MOOs puts

it, “We found ourselves trapped in the conventional classroom, haunted by stifled learning, oppressive seating arrangements, time and space – boundaries we long to transgress. And then there was MOO” (p. 7).

Educational researchers and theorists are divided over the impact that differing media have on learning. One school holds that the medium (or media) utilized in a classroom (traditional or online) is rarely the determining factor in learning effectiveness (Rovai, 2002a; 2002b). Rusell (1999), for instance, concluded that course design and pedagogy were far more relevant to learning effectiveness than the medium of learning after comparing the performance of over 400 students, some having taken a course online while others having taken the same course in a traditional classroom. Clark (1983) is even more definitive in concluding, after reviewing numerous studies and meta-analyses of the influence of media on learning, that “media do not influence learning under any conditions” (p. 445). To drive his point home, Clark goes on to say, “The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition” (p. 445). In fact, one could argue that the entirety of the No Significant Difference Literature stands in support of this conclusion, since to conclude that online learning is just as effective as face-to-face learning is essentially to conclude that medium (online versus face-to-face delivery) is immaterial to learning effectiveness. Rovai (2002b) takes the argument one step further by inferring that the lack of a difference in effectiveness between online and traditional classes suggests that the medium of learning, likewise, has no impact on the building and nurturing of community.

Just as the No Significant Difference literature stands in support of the "medium has no effect on learning" premise, the findings of isolation, high rates of attrition, and the associated conclusion that online learning is not for everyone stemming from that same body of literature argue for the opposite conclusion: That medium has a very real impact on community development and on learning. The strongest possible statement of this position, in stark contrast to Clark's stance above, is Marshall McLuhan's (1964) now classic repost that "the medium is the message." Applying this concept to education, an advocate of McLuhan's position might argue that one cannot separate the content of learning from the medium through which it is conveyed. Rather, the medium has a tangible influence on the experience of the learning that manifests itself in ways that may not be discernable through traditional format comparison studies, such as the sense of isolation and attrition observed among students participating in "just as effective" online courses. It is this underlying philosophy which has led instructors and educational researchers to explore ways in which the use of alternative online media might impact on student learning experiences, including social interaction and sense of community.

Presence and Social Presence

One construct that has grown out of research into the use of virtual reality software and which has a direct bearing on community building in online learning is that of presence. Presence, as the term is used in the virtual reality literature, is the sense, experienced by users of a virtual environment, of being "in a place" rather than of using a computer program, where the "place" is the environment depicted by the software rather than the physical surroundings of the room where the software is being used. The more

that a virtual environment commands the attention of the user and immerses the user in its projected reality to the exclusion of the user's actual, physical surroundings, the stronger the sense of presence is said to be (Slater, 1999). Another conception of presence that goes hand in hand with the first is that of non-mediation. Under this conception, presence in the virtual environment is said to increase as the user's awareness of the technological medium through which the virtual environment is accessed decreases and a user can be said to have the highest possible sense of presence when "objects, events, entities, and environments are perceived as if the technology was not involved in the experience" (Schuemie, Van der Straaten, Krijn, & Van der Mast, 2001). In online learning, where students' physical separation from one another leads to the commonly reported sense of isolation, one can see the importance of the concept of presence. If an online class can generate a perception among its participants who are separated by distance that they are present in a common, virtual meeting place, then isolation may be significantly reduced. Yet presence is only one media-related construct that may impact on student isolation and attrition in online classes. The second media component is a related concept from the online learning literature: Social presence.

Whereas presence can take place when one person is interacting with a virtual environment and feels "transported" to the world depicted by the software, social presence occurs when multiple users are interfacing with the same virtual environment and have a perception not only of their own presence within the environment but also a perception of the presence of the others. Whereas users experiencing presence can state a sensation that "I am here" (where "here" is the world depicted by the software), users

experiencing social presence can state a sensation that “we are here together” even though none of the users are in the same physical setting (Schuemie, Van der Straaten, Krijn, & Vander Mast, 2001). Social presence has also been defined as “the degree of salience of another person in an interaction and the consequent salience of an interpersonal relationship” (Tu, 2002, p. 34) or “the degree of feeling, perception, and reaction of being connected by computer-mediated communication to another intellectual entity” (Tu & McIsaac, 2002) and has been found to be a strong predictor of student satisfaction in online courses (Hackman & Walker, 1990; Gunawardena & Zittle, 1997).

According to Tu (2002), social presence consists of three dimensions: Social context, online communication, and interactivity. The first dimension, social context, refers to those qualities of the students (comfort with technology, pre-existing familiarity with other class participants) and qualities of the class environment (perceived privacy, informality) that set the tone for the kinds of communication that will take place in the class. The second dimension, online communication, refers to the nature of the language exchanged by participants during the course. Language that conveys feelings, is expressive, stimulating and clear helps to establish relationships among learners and enhances social presence. The use of such language is determined, in part, by characteristics of the learners (such as keyboarding skills) and by characteristics of the online learning environment (such as whether it is a synchronous or asynchronous forum). Finally, interactivity refers to the extent to which the course design (academic tasks, scaffolding, etc.) supports interaction among participants and the degree to which the supported interaction is relational in nature (as opposed to purely task-oriented or

academic in nature). For instance, an online class in which a large group is broken down into smaller groupings and where those smaller groups are required to engage in collaborative learning projects would tend to exhibit more social presence than an online lecture class in which the large group remains intact and plays a passive role. Likewise, a class in which students are expected to contribute lengthy, on-task discussion posts might have weaker social presence than a class where brief, informal conversation is encouraged (Tu & McIsaac, 2002). As conceived by Tu and his colleagues, social presence is a highly significant factor in the communicative effectiveness of online media and the resulting effectiveness of the online classes that employ them.

The potential application of these four, related constructs – interaction, presence, social presence, and sense of community – to enhance the research community's understanding of the online isolation and attrition phenomenon and methods for combating it appears clear. In an effort to explore this potential, researchers have begun to examine how each of the former three constructs can be maximized, how variations in each impacts upon online learning, and in some instances how these constructs relate to one another. In the literature on presence, for instance, researchers have focused on which technologies and activities yield the strongest sense of presence among users, how variations in presence affect task performance, and how presence in a virtual setting affects users' physical and emotional responses to that setting as compared with a real-world setting (Schuemie, Van der Straaten, Krijn, & Van der Mast, 2001). Numerous studies have examined how interaction manifests itself in online classes (Walther 1992, 1995, 1996), how it impacts on student performance (Swan, 2001), and how interaction

in online courses compares with interaction in face-to-face classes (Smith, Ferguson & Caris, 2001; Tiene, 2000; Wells, 2000). In one study, for example, researchers examined performance in an online course in relation to both student interaction and sense of presence with mixed results (Picciano, 2002).

Like the literature on presence, the social presence literature is replete with studies exploring those aspects of online communications that enhance or detract from social presence (Tu, 2002, Gunawardena, 1995) and studies that examine the relationship between social presence and various outcome measures in online learning, such as learner satisfaction (Gunawardena & Zittle, 1997). Tu and McIsaac (2002) also looked at the relationship between social presence and interaction in an online class and found that social presence is a "vital element influencing online interaction" (p. 146). In contrast, however, the literature on sense of community in online learning has thus far confined itself to the development of an instrument for the measurement of the construct, and comparisons of online, hybrid (or blended) and traditional classes in terms of students' sense of community (no significant difference was found between the formats) (Rovai, 2002a, 2002b). No studies have yet been conducted to examine how variations in online course designs and formats might affect sense of community. Another limitation to much of the literature on all four of these constructs is that the studies focus on the predominant online learning medium, the asynchronous discussion forum, to the exclusion of alternative online media. The social presence studies cited above, for instance, limit their analysis to innovations that can be applied within asynchronous learning networks, such as email and discussion boards, rather than considering other media such as synchronous

chat or virtual environments. And while the literature on online learning is replete with papers in which online educators describe how their use of a particular online medium, such as a virtual environment, produced a thriving online learning community, most of these articles are anecdotal in nature and do not apply formalized conceptual frameworks or protocols for data collection or analysis (O'Day et al, 1998; Looi & Ang, 2000; Jacobson, 2001).

Contrary to Russell (1999), Clark (1983), and Rovai (2002b), the evidence suggests to this author that the medium or media through which online learning is presented and conducted may, indeed, have an impact on the manner in which students interact and the degree to which they develop a sense of presence, social presence, and ultimately, a sense of community. This, in turn, may play a major role in whether students experience the isolation commonly reported among online learners, and, likewise, may significantly impact on their likelihood of persisting in the online class. With the exception of those researchers noted above, most of those investigating the constructs discussed herein have stated that more research is needed into which elements of online instructional design and implementation, namely which combinations of learning/communicative media and pedagogical strategies, are most effective at maximizing those constructs. Even Rovai (2002a) concedes that online learning media have limitations, when compared with the face-to-face classroom (such as a lack of immediate feedback), for which online course designers must compensate through pedagogy when attempting to create sense of community in an online class. In accepting the asynchronous discussion board as the gold standard of online instruction, however,

Rovai does not consider the possibility that some online media may have fewer of these "limitations" than others. For instance, Haythornthwaite, Guziec, Robins and Shoemaker (2000) note the finding from their research that synchronous communication, such as provided through an IRC chat system, is far more effective than an asynchronous forum at building community, largely because of the immediate feedback afforded by such systems. Clearly, just as the nature of the physical learning space has been found to impact upon learning in traditional classrooms, the medium through which online learning is conducted may also impact on student interaction, presence, social presence, and sense of community.

Definitions

Based on the preceding discussion, the conceptual definitions of the four major constructs forming the framework for this study are as follows, while their operational definitions are described in Chapter III.

Social Interaction: Reciprocal exchange between at least two actors that serves to build relational ties among the actors (Wagner, 1994; Walther & Burgoon, 1992).

Presence: The perceptional illusion of nonmediation, a phenomenon in which "a person fails to perceive or acknowledge the existence of a medium in his or her communication environment and responds as he or she would if the medium were not there" (Lombard, Reich, Grabe, Bracken, & Ditton, 2000, p. 77).

Social Presence: The degree of salience of another person in an interaction and the consequent salience of an interpersonal relationship (Short et al., 1976; Walther & Burgon, 1992 – See Tu, 2002), comprised of three dimensions: Social context (the

degree to which users perceive an online medium to be a "social medium", online communication (the kinds of communication supported by the online medium), and interactivity (the types and quality of the interactions afforded by the technology) (Tu, 2002; Tu & McIsaac, 2002).

Sense of Community: A feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together (McMillan & Chavis, 1986).

Purpose of the Study

If, in fact, online learning in institutional higher education is a part of the "mainstream" as claimed by the Sloan Consortium (2005), and is here to stay, then it is incumbent upon educational institutions to ensure that they are designing and implementing their online programming in a way that lives up to the claims of expanding access so commonly used to justify these programs. While critics may be correct in charging that the initial push toward online learning has grown more out of a "market" mentality, corporate influence, and governmental pressures than concern for the traditional mission of the university, the reality is that online learning is here and pervasive. And while it may be true that the standard, asynchronous format of most online classes has developed more from an overemphasis on cost effectiveness and convenience than proper concern for pedagogy and quality learning, it need not be the only method of conducting class online. Like traditional classroom instruction, online learning cannot be a static entity, failing to adjust to new research findings and failing to welcome innovation and experimentation in the name of improvement. As Weigel

(2000) has stated so well, the time has come to move beyond the No Significant Difference literature. The question of whether online learning is "just as good" as traditional learning has been put to rest. Now educational researchers need to be asking what are the best ways to design and conduct online learning so as to overcome the shortcomings, such as isolation, an overemphasis on independent work, and the associated attrition identified by the NSD studies. The current study is one among many other projects designed to take some initial steps toward this goal of going beyond "just as good" and attempting to maximize the online learning experience for all students, not just those who perform well independently and in isolation from others. Viewed another way, research of this nature has the ultimate goal of leveling the playing field and rendering obsolete those questionnaires in use by so many institutions whereby students gauge whether they are "suited" for online learning or if they should, instead, relegate themselves to the traditional classroom since their "likelihood of success" online is low.

The present study is designed to fill two gaps in the existing literature. First, the researcher seeks to examine the manifestation of social interaction, presence, social presence, and sense of community in online instruction in order to assess the relationships between these constructs and how they act in concert to affect student learning experiences. Second, the researcher will examine how the use of an online medium other than the traditional asynchronous discussion forum affects the occurrence of social interaction, presence, social presence, and sense of community in an online class. An examination of the impact of all possible alternative media on all conceptual factors that may impact upon the success of online learning is beyond the scope of this or any study.

However, an attempt to examine the impact of one particular medium within the context of a selected conceptual framework is a feasible beginning. As such, the purpose of the present study is to examine the impact that a specific online medium, a virtual environment, has on the development of sense of community and its associated constructs, presence, social presence and interaction in an online class, and to determine how these four constructs affect one another and work together to influence learner experiences and outcomes in an online class. More specifically, the goals of this investigation are to:

1. Determine how the four constructs of presence, social presence, social interaction, and sense of community manifest themselves in an online course.
2. Determine how the use of a virtual environment as an online instructional forum contributes to the development of presence, social presence, social interaction, and a sense of community among students.
3. Determine how the four constructs of presence, social presence, social interaction, and sense of community mutually influence one another.
4. Determine how the interplay of presence, social presence, social interaction, and sense of community impacts upon student learning experiences, including their sense of isolation and degree of persistence in an online class.

Similarly, the research questions guiding this study are as follows:

1. How do the four constructs of presence, social presence, social interaction, and sense of community manifest themselves in an online course?
2. How does the use of a virtual environment as an online instructional forum

contribute to the development of presence, social presence, social interaction, and a sense of community among students in an online course?

3. How do the four constructs of presence, social presence, social interaction, and sense of community mutually influence one another?

4. How does the interplay of presence, social presence, social interaction, and sense of community impact upon student learning experiences, including their sense of isolation and degree of persistence in an online class?

CHAPTER II

REVIEW OF THE LITERATURE

The concepts that serve as the framework for this study (interaction, presence, sense of community and social presence) are drawn from a diverse body of research literature encompassing the fields of psychology, sociology, communications, and both traditional and online education. As one reviews this body of material it quickly becomes apparent that researchers both between and within disciplines have used these terms (interaction, presence, etc.) to mean substantially different things. This absence of a consensual definition of many of these terms necessitates that a review of the relevant studies on each concept be prefaced by a clarification of the concept's meaning and research context. Interaction, for instance, is a concept which seems relatively simple at face value, but which is subject to a wide range of definitions and usages within the literature. As so eloquently summarized by Anderson (2003), the term interaction has traditionally been applied within the educational literature to describe classroom-based communication or dialogue between students and teachers, a concept so intuitive that researchers frequently failed to formally define it. As technology-based distance education has developed, however, educational researchers have been forced to expand, refine, and formalize the concept of interaction to encompass the kinds of exchanges that take place via technology in distance courses, such as audio or video conferencing, asynchronous online discussions, and synchronous online chat.

Interaction

Early definitions from the media and communications literature characterized interaction as the transmission and receipt of reciprocal messages (Shannon and Weaver, 1949), a concept later referred to as completed message loops (Yacci, 2000). Though educational researchers have broadened the characterization of interaction as an engagement or exchange between two or more people, they have differed in whether this engagement is best described as an event, process, situation (Shin, 2002), or even an environment (Roblyer & Wiencke, 2003). Some researchers have equated the terms "interaction" and "interactivity" (Anderson, 2002) while others have regarded these as related, but separate concepts, the former being the actual engagements between class participants, and the latter being the degree to which a medium supports the former (Bates, 1990). Anderson (2003) also notes that the conceptualization of interaction as an exchange between people is overly restrictive since research has shown that people can interact with inanimate objects, materials and technology.

Both Anderson (2003) and the present author favor the functional definition established by Wagner (1994) in which interaction is defined as "reciprocal events that require at least two objects and two actions. Interaction takes place when these objects and events mutually influence one another" (p. 8). This simple and broad definition captures the two key elements of interaction, namely, a plurality of actors/entities and reciprocal influence and is applicable whether the actors are human or non-human, animate or inanimate, and verbal or non-verbal. If agreement on a conceptual definition of interaction is difficult, agreement on an operational definition must be characterized as

nearly impossible given the plethora of operationalizations employed in the literature. Some researchers, for instance, define interaction simply in terms of the number or length of student postings to discussion boards: As the number of postings increases or the average length of each posting grows, the amount of interaction is said to increase. Other researchers operationalize interaction not only by the number of posts but the degree to which students' contributions to an online discussion relate back to the postings of others. Perhaps the most common method of operationalizing interaction in the research literature is to rely on students' own understandings of the term. Such studies gauge the level of interaction in a course by the degree to which students report (through interviews or responses to questionnaires) their having perceived it as "interactive." Some studies within the literature take great care to delineate the conceptual definition of interaction the researchers are applying within the study, while many others continue to treat the term as if its meaning were self-evident and fail to formally indicate the definition being employed, leaving it to the participants and the reader to apply their own meaning. In either case, this review of the literature on the phenomenon and relevance of interaction in online learning will take care to note the definitions employed within each research study described, when applicable.

Beyond the issue of a conceptual and operational definition of interaction, the research literature has also considered the different types or modes of interaction that can take place in educational settings. Moore (1989) delineated the three modes that have characterized traditional education and that were initially also applied to online education: student-teacher, student-student, and student-content. The latter has been

made possible through the development of computerized content that can vary its responses based on student input. As such, the content and student mutually affect one another. Anderson (2002) goes on to delineate three additional modes of educational interaction, each characterized by the nature of the objects or entities which are influencing one another: teacher-teacher, teacher-content, and content-content. As with student-content interaction, content-content interaction has been made possible through the development of technology. Now, Internet-based content software that updates itself has led to educational content sources exchanging information and updating one another online without human intervention. Most research articles on interaction in online learning have tended to focus on the student-teacher and student-student modes of interaction, though the other four are beginning to receive more attention in the literature.

In addition to the issues of definition and modes of interaction, online learning researchers have thoroughly examined the nature and functions of interaction in online settings, frequently in comparison to that found in traditional classrooms. Since, as discussed above, the predominant platform for participant communication in online classes has been the asynchronous, threaded discussion forum, the majority of the studies on interaction in online learning focus on this medium and therefore presume that online interaction is achieved primarily through the exchange of asynchronous, textual messages. Within this context, researchers have drawn a number of common conclusions. For instance, Picciano (1998) found in his case study of an asynchronous online course from Hunter College in New York, that participation in the online discussion took more of a time commitment from students than would participating in a discussion in a

traditional classroom, largely because of the need to read voluminous threads and posts to keep up with the discussion. The 17 participants, who communicated online using a listserv and from whom data were collected using a variety of quantitative and qualitative methods, tended to reflect and think through their comments, post long comments (2 to 3 paragraphs) and participate in a more egalitarian fashion than is commonly found in f2f classes. As the discussion below will demonstrate, these are common findings and common characterizations of online learning which many researchers see as advantageous. In addition, Picciano's study revealed the substantial finding that the degree of instructor engagement with students and the actual amount of discussion taking place in the course (measured in terms of the number of postings) was related to student perceptions of their own learning and satisfaction with the course.

The concept of a connection between the perceived and actual levels of interaction in a course and student satisfaction and sense of learning within the course has broad and strong support in the literature. One example is Swan's (2001) quantitative survey of 3800 students enrolled in 264 online courses through the State University of New York (SUNY) Learning Network. The more than 1400 responses indicated that students who reported higher levels of interaction with content, instructor and fellow students reported higher levels of satisfaction and learning from their courses. These results were confirmed both through analyses of variance on the entire data set and correlational analysis of a smaller sample (N=73). Swan's data also suggested that the more emphasis placed on discussion in an online course, the more satisfied were the students and the more the students felt they learned. Ironically, however, the more the

class emphasized group or cooperative/collaborative work, the less students thought they learned. Note, the data on satisfaction, learning and perceived interaction were based on student self reports in which students applied their own understandings of those terms. However, there was a strong correlation between student perceptions of peer interactions and the actual frequency of exchanges and length of discussion responses, suggesting that the students defined the former in terms of the latter. Swann concluded that student interactions with content (through a sound course design), teacher (through an active instructor), and peers (through a strong course emphasis on discussion) are critical to the creation of a "community of inquiry" which is essential to the success of an online course.

In a similar study, designed to examine performance in an online course in relationship to student interaction and sense of presence, Picciano (2002) found a strong positive relationship between students' perceived interaction and their perceptions of quality and quantity of learning in the course. A positive (though not significant) correlation was also found between quantity of interaction (measured in number of posts) and student performance scores. Student perception of the level of interaction in the course was also positively (and significantly) correlated with student quantity of postings, suggesting that quantity of posts is a reliable indicator of student interaction (though no specific definition of interaction was employed in soliciting student reports, leaving participants to apply their own understanding).

Approaching the issue from another angle, Bernard, Brauer, Abrami, and Surkes (2004) devised a questionnaire for predicting a student's success in an online course

based on their review of the literature on student needs in online classes. They then administered the instrument to 167 students enrolled in an online undergraduate course at Concordia University in Montreal, Canada over three semesters. Their findings suggested that a student's self-reported need for interaction with peers and the instructor was a negative predictor of success in the online course, which is not only consistent with the connection between interaction and perceived learning noted above but also with the common conception that students who need or desire interaction are not well suited to online classes. This phenomenon has also been noted in purely qualitative studies. Canning (2002), for instance**,** conducted a case study of fourteen students in an online course using semi-structured interviews to gain insight into students' learning experiences. Canning observed that student-teacher interaction was critical to students' perception of successful progress in the class. If students felt a lack of attention from the instructor, students felt isolated and frustrated. This finding is consistent with Anderson's (2002) proposal that student-teacher interaction and other modes of interaction can be just as important to successful online learning outcomes as student-student interaction. It is also consistent with the concept, delineated by Anderson, Rourke and their colleagues (2001) of the significant role that a strong teacher presence in an online class can have on student outcomes. These and similar findings throughout the literature have firmly established the connection between student-student (Beaudin, 1999; Swan, 2001; Wu and Hiltz, 2004; and Jeong, 2003) and student-teacher (Frederickson, Pickett, Pelz, Swan, & Shea, 2000; Shea, Frederickson, Pickett, Pelz, & Swan 2001; Shea, Swan, Frederickson, & Pickett, 2002; Richardson and Swan, 2000;

Jiang and Ting, 2001; and Chang, 2003) interaction and both learner satisfaction and perceptions of learning in online courses.

In a conceptual piece, Anderson (2002) expands on this concept by suggesting that effective learning and student satisfaction can take place when one mode of interaction is strongly supported by an online class even if the other modes are not. If student-content interaction is strong, then a lower level of student-student and student-teacher interaction would still permit an effective and satisfying course. Though offering no empirical study to test this theory, Anderson suggests that assessing the level of interaction in an online course is largely a quantitative exercise in which researchers count the number of posts or interactions. He then proceeds to characterize several different teaching modalities (traditional face-to-face lecture, interactive video, web-based, etc.) in terms of whether each mode of interaction (student-content, student-student, student-teacher, etc.) is high medium or low. However, Anderson offers no explanation or research justification for how these values are determined. Anderson proposes, based on his own experiences in designing and teaching online classes and on his own research, that an adequate (not high, but adequate) level of all three modes yields effective and successful online learning experiences. Taken in isolation, the work of Anderson and the researchers cited above appears to establish not only that interaction can take place in online classes, but that it has a positive influence on student outcomes in such courses.

Another common thread from the literature on interaction within online classes is not so positive. MacDonald and Thompson (2005), in a case study of students enrolled in

an online course at the University of Ottawa, found that while the students perceived the online discussion as interactive (no specific conceptual definition was applied), these students did not feel they had enough interaction with their peers and missed the face-to-face communication of a traditional course, leading the researchers to conclude that students do not value online interactions as highly as they do face-to-face. The students also reported the perception that the development of trust and rapport among their peers was slowed by the online format, as compared with a traditional class. These results are consistent with findings from a number of other studies suggesting that the online format, because of its lack of spontaneity, absence of non-verbal cues, and lack of media richness is incapable of facilitating meaningful interaction among students and between students and their teachers, leading to isolation and a preference for the traditional, face-to-face format (Phillips and Santoro, 1989; Sproull and Kiesler, 1986; Siegel, Dubrovsky, Kiesler, and McGuire, 1986; Kiesler, 1986; Culnan and Markus, 1987; Poole, 2000; Hollingshead, McGrath, and O'Conner, 1993; Rice 1984, 1993; Rice and Case, 1983; Steinfeld, 1986; Trevino, Daft, Lengel, 1990; Foulger, 1990).

The findings and conclusions drawn from these studies stand in marked contrast with those of the studies described previously. On the one hand, students appear to perceive the occurrence of interaction in online courses and said interaction contributes toward students' sense of satisfaction and learning in those courses. On the other hand, however, the limitations of the online format appear to prohibit meaningful interaction and leave students feeling isolated. On initial inspection, these findings appear to contradict one another. However, such findings can co-exist if, in fact, two different

kinds of interaction are being described within these two divergent research threads, one of which has been shown to be well-supported by the online format and the other of which has not. In more deeply exploring the functions and roles of interaction in both online and traditional courses, researchers have begun to distinguish between the cognitive or content role of classroom interaction and the social or socio-emotional role. For example, Chidambaram and Bostrom's (1996) review and synthesis of group development models in online learning revealed that a well-developed group balances between socioemotional needs and task needs, indicating not only a distinction between content interaction and social interaction but also that both are important. Walther (1992, 1996, 2001), in his thorough exploration of computer-mediated communication, characterizes this dichotomy as one between impersonal, task-oriented communications and personal, relational communications, while Rourke, Anderson, Garrison, and Archer (1999) describe it as the difference between cognitive experiences generated by content-related interactions, and social presence generated by relationship-building interactions. Regardless of the terminology employed, this distinction between academic/content/cognitive interactions and relational/social/personal interactions is a recurrent theme in the literature. With regard to the former, researchers appear largely unified in their findings that the online format can support quality content discussions as well as if not better than traditional classes. With regard to how well online classes support social interaction, however, the jury is still out.

Olga Dysthe (2002) suggests that two of the major paradigms impacting on the development and use of educational technologies such as online media have been those

of constructivism and the resultant emphasis on collaborative learning. Within the context of constructivism and its view of learning as a product of reflection, collaboration, and active engagement with ideas and issues situated in authentic settings, instructors and researchers have designed, implemented, and observed online classes and the kinds of interactions that take place therein. Based on those observations, a great plurality, if not the majority of these researchers have reported that the kinds of academic interactions or discussions taking place in online classes strongly exemplify and support constructivist learning principles. Smith, Ferguson, and Caris (2001), for instance, in a qualitative study of the online teaching experiences of 21 instructors, performed content analysis on their telephone and email interviews with these instructors to identify themes. They found that the written and asynchronous nature of the online discussion promoted a deeper level of discourse than in a face-to-face class, providing learners with the ability to carefully consider their own contributions and those of their peers. In addition, the sense of anonymity afforded by the online format yielded more democratic participation among students and more equality between students and teacher than would be expected from a traditional class. These findings were echoed in a survey study conducted by Tiene (2000) over a two-year period with students participating in five hybrid classes. The survey, designed in consultation with students and intended to assess differences between online and f2f discussions, yielded results extolling the academic effectiveness of online discussions. The asynchronous nature of the communication online was seen as promoting quality content interaction because students could think about their responses, and the written nature of the communication was seen as promoting better thought out

and articulated responses. Some students went so far as to say they preferred writing to talking, saying it was more comfortable.

Further confirmation of the academic value of online discussions can be found from Poole's (2000) case study of fourteen students enrolled in a graduate online course at California State University, Stanislaus. These students, for whom this was their first online course, interacted asynchronously using WebCT. The study, whose purpose was to understand how students engaged with one another and with the course, revealed that students varied in their degree of participation (though a minimum level was required) with some ignoring (not reading) posts from other students, a phenomenon that could not take place in a f2f discussion. The majority (85%) of postings were content-related with only 15% non-content (social or other). Discussions were initiated far more often by students (70%) than by the teacher, indicating a more egalitarian environment (an environment where students take control and the teacher does not dominate) than in f2f classes. As in other studies, students appreciated the depth of contributions afforded by the asynchronous nature of the forum, which allowed them time to reflect on one another's thoughts. In like manner, Gustafson and Gibbs (2000) conducted a case study of a postgraduate online course with a facilitator and 13 students, none with prior online class experience. Their data sources included the full text of the online discussion board threads and email exchanges between facilitator and students, notes about "live" (phone and f2f) contacts between students and facilitator, assignment results, and student course evaluations. Their analysis of the discussion contributions revealed that only 30 percent of the contributions were general (non-content related) in nature (with around 18 percent

coded as personal or introduction) and around 10 percent were technical (questions about how things worked or about computer problems), meaning the vast majority of postings (about 60% percent) were content-related. Consistent with other studies, 84% of the discussion was generated by students as opposed to the facilitator, and the content postings were described as being of high quality, indicating reflection and critical thinking.

These themes of quality discussion, reflection, critical thinking, and egalitarian participation are also found in numerous other studies. For example, Cartwright's (2000) case study of the use of an asynchronous discussion in a required undergraduate course on nursing and health policy among 24 students found that the online format promoted excellent content-discussion and reflection. In addition, the researchers/instructors found that the online discussion showed more student-initiated activity, higher quality, and better application of concepts than the f2f discussion. Indeed, their results indicated that the online discussion was so effective that subsequent offerings of this course used online discussion as the only method for case discussion. In another case study of an asynchronous forum, Holt, Kleiber, Swenson, Rees, and Milton (1999) attempted to determine the degree to which deliberation takes place in on-line forums using protocol and discourse analysis. They found that an asynchronous forum supports deliberation because of the sequencing of ideas and the ability to re-read the entire sequence of postings on a topic and that this mode of interaction prompted critical thinking. Likewise, Jeong (2003**),** in a mixed methods study of an online discussion used as part of a blended MBA course for 34 graduate students, used sequential analysis to confirm that

the online discussion board postings did exhibit strong evidence of critical thinking. Similarly, Dysthe (2002) conducted a case study of a blended course for ten graduate students in which an online discussion forum was the primary means of communication between the instructor and class participants. Dysthe found that the online discussion was highly dialogic in nature, meaning that student contributions indicated that they were reading one another's comments and responding to one another's ideas, rather than merely posting in parallel. She also found that all of the students demonstrated similar levels of participation even though no mandated participation level standard was employed.

It must be noted that some studies exploring these issues have yielded less favorable views of the educational benefits of online discussions. For instance, Angeli, Valanides, and Bonk (2003) found poor critical thinking and overall poor content quality in the online discussion used in a blended required course for undergraduate student teachers. The results indicated that the participants did not value the online forum and the quality of their posts reflected this attitude. Likewise, Gustafson and Gibbs (2000) found that while individual student posts were of high quality and exhibited reflective thinking about the content, the students failed to actively engage one another's ideas. Rather than critically analyzing one another's comments, student discussion was characterized as "side-by-side exchanges" showing student-content interaction, but little academic student-student interaction. Another inconsistency with other research was that online discussion participation was not egalitarian among the students, with four people dominating the board. While outcomes for the course under study were comparable to

those of a f2f section, the facilitators and researchers rated the online discussion as less valuable than the f2f class.

Despite the presence of some studies such as these that document unfavorable academic applications of online interaction, the vast preponderance of studies supports the notion that online discussions are well suited to facilitating constructivist learning and are at least as effective as, if not better than, face-to-face discussions (Dean, 1994; Harasim, 1990; Dede, 1996; 2000; Gabarro, 1990; Varsidais, 2000). Yet, despite these conclusions, researchers studying online learning have also consistently found that students express a preference for face-to-face interaction over online interaction when given the choice. Representative of this phenomenon is Tiene's (2000) survey of instructors in online courses in which the researcher presumed that the "affective" component of f2f discussions was absent from online discussion, but reported that students were mixed on whether they missed it. When asked in a different way, however, the students made their preference clear. Three fourths of the respondents said they preferred f2f discussions if they had to choose, indicating that despite the advantages of online discussions acknowledged by these same students, f2f communication still offered something they valued which the online forum did not. Perhaps no study captures this phenomenon better than that of Poole (2000) who observed the same litany of educational benefits to online discussions cited above. Nevertheless, the students repeatedly sounded the theme that they missed the personal ties that come from f2f contact. A quote from one student in this study clearly expresses the sentiment in saying, "I enjoy having the opportunity to think things through before writing to an audience of

'peers.' However, I am finding it challenging to not have the opportunity to interact with you face to face. I find that I miss the 'humanity' of it all . . . the real laughs and chuckles vs :)" (p. 172). Clearly, even when the quality of content or academic interaction is high, students and instructors in online classes can find that the overall interaction in the class is wanting. Another valuable component of classroom interaction may still be missing.

Social Interaction

Standing alongside the many articles establishing the academic value of online discussions is a substantial literature exploring another vital function of classroom interaction: The establishment of social relationships and learning community. Whether described as social interaction, relational communication, non-content interaction, or another moniker, educational researchers have begun to examine the significance of the social side of interaction. Researchers have addressed not only the question of whether such social interaction can take place in online classes, but how it manifests itself, the role that it plays in student learning, and what elements of online course design can impact on its development.

Much of the early research into online distance learning concluded that social interaction was either impossible or at best highly deficient when compared with face-to-face classes because of the absence of immediate feedback and non-verbal social cues such as voice inflection and facial expressions (Walther, 1996; 2001). One recent example of a study supporting this perspective is Kanuka, Collett and Caswell's (2002) qualitative piece on the experiences of instructors teaching online classes. In the study,

twelve instructors of online classes were interviewed by the researchers over a two-year period and indicated difficulties in establishing the kind of rapport, collegiality and trust among students in an asynchronous online learning setting that they normally experienced in face-to-face classes. A loss of spontaneity was seen as a significant deficiency to the asynchronous online format and the primary impediment to social interaction.

While studies still abound which support this accepted conclusion that online learning cannot foster meaningful social interaction, recent years have seen a growing literature challenging this notion. Numerous researchers have reported observing the development of real and meaningful social interaction among students in online courses and other online settings, suggesting that conclusions to the contrary may have been premature. For instance, Parks and Floid (1996) surveyed 528 users of Internet newsgroups concerning the nature of their online relationships with other users and found that the large majority of respondents reported having formed meaningful relationships with others online. The literature supporting online social interaction also includes many of the studies described above that also address the academic value of online discussions. One example is the Gustafson and Gibbs (2000) case study in which the authors found that while individual student posts were of high quality and exhibited reflective thinking about the content, the students failed to actively engage one another's ideas. In addition to the reflective thought evidenced by the discussion posts, the researchers noted a strong social element to the discussion. During the first three weeks, 47% of the posts were self-introductions or of some other personal nature as participants got to know one another.

The contributions were also categorized as fulfilling one of seven purposes: humanizing, eliciting, organizing, responding, explaining, opining, or informing. On final tally, though only about 10% of the posts were coded as "humanizing" (the largest single purpose was "responding" with over 31% of the posts), the researchers reported the development of a warm social climate with rapport, suggesting that the content posts were not only of high academic quality but also conveyed social meaning. Indeed, so strong was the social element, that the researchers questioned whether the warmth of the social interaction may have impeded the content interaction by making participants reluctant to critique one another.

In another qualitative study, Wegerif (1998) examined how social factors affected the learning of 21 students from three different countries in an online, three-month course (the Teaching and Learning Online course from the Institute of Education Technology) taught using an asynchronous conferencing system. Data sources included online discussions (both those integral to the course and those initiated by the investigators), students' emails, an online and a postal questionnaire, telephone interviews, students' course evaluations, and interviews with course tutors. This ethnography supplemented by questionnaires revealed that success in the course depended on the degree to which students were able to cross a threshold from feeling like outsiders to feeling like insiders. Crossing this threshold was achieved through social interaction that took place in the text-based medium despite its limitations (such as not supporting threading) and that led to sense of community among learners. Students who crossed this threshold ranked the computer-mediated communication as promoting better interaction than face-to-face

classes, while those who did not felt otherwise. Similarly, in a series of quantitative studies designed specifically to challenge the notion that online media cannot foster social interaction, Walther, both alone (1996, 2002) and in conjunction with Judee Burgoon (1992) and using the themes of relational communication developed by Burgoon and Hale (1987) found that computer-mediated communication is not only capable of fostering relational communication comparable to that of face-to-face settings, but that in some instances is "hyperpersonal," or more intensively social in nature, than is face-to-face communication. Walther takes his results to clearly show that given the proper care, design, and time, online settings can promote social interaction that is every bit as real and meaningful as face-to-face settings.

The surge of studies demonstrating social interaction in online courses, when juxtaposed against the existing literature concluding such interaction was not possible, has led researchers to identify characteristics of online learning that promote social interaction and those that inhibit the same. In an effort to gain an understanding of modes of social interaction and social climate as they develop in online classes and those strategies that might facilitate their development, Oren, Mioduser and Nachmias (2002) reviewed a series of five studies conducted by researchers at Tel-Aviv University's School of Education. From their review of the findings in all five studies, Oren and his colleagues concluded that social interaction does take place online and strengthens over time as a course progresses. They also saw evidence that people develop new conventions of communication to convey social meaning online to compensate for the lack of visual cues (i.e. the use of emoticons) and that both content-related and non-

content related communications can convey social meaning. These researchers also concluded that a reduced role of the teacher in online settings is a factor in increased social interaction among students, but not all of the online learning settings they studied accomplished this reduced teacher role. They suggest that unconventional, student-controlled pedagogy and the use of small groups may be necessary for fostering social interaction in online learning.

The idea that content-related discussions can convey social meanings is reinforced through an article by Woods and Ebersole (2003) who conducted a naturalistic case study of twenty-six students in two online courses (one at Regent University and one at Indiana Wesleyan University) using quantitative and qualitative data collection procedures. The authors created four non-subject matter discussion folders and placed them with the subject-specific folders on the online discussion board. They then used content analysis of the discussion contributions, interviews with the learners, and an emailed survey of participants to assess the impact of those four non-subject folders on student interaction and sense of community. The authors found, however, that these adult learners were relatively unlikely to use non-subject matter folders, keeping their interaction primarily confined to the subject-matter discussion. Despite the inactivity of these non-subject matter folders, however, the students reported developing a strong sense of rapport and community in the class, suggesting that they interacted socially through their content-related discussions. These findings clearly indicate that the academic and social functions of interaction can both be fulfilled within the same "content-related"

discussions, and that the absence of "non-content" discussions need not indicate the absence of social interaction.

Even if one accepts that online learning is capable of supporting both quality academic discussions and meaningful social interaction, one need not be convinced that both are necessary for online instruction to be effective. Gustafson and Gibbs (2000) noted, for instance, that the strong social interaction displayed in their online class may have detracted from the academic value of the online discussion because students were being too friendly to engage in critical analysis of one another's posts. These authors might, therefore, agree with the perspective described by Walther (1996) and advocated by Dubrovsky (1985) whereby computer-mediated communication is valued most where social interaction is minimized in favor of efficient, task-oriented exchanges that achieve group goals without relational distractions. The theoretical framework for online interaction offered by Anderson (2002) certainly supports the notion that social interaction is not a necessary component of online learning if one of the other modes of interaction is maximized. For instance, if students have strong interaction with course content, then Anderson would suggest that effective learning can take place even if student-student and student-teacher interaction (both academic and social) are minimized. This position is consistent with studies of one-on-one online learning modules, tutorials, and automated interactive media lessons that offer strong student-content or student-teacher interaction but no student-student interaction at all yet have been found to be highly effective (Duffy and del Valle, 2005; Malopinsky, Kirkley & Duffy, 2002; Sener, 2001).

Another angle of the debate among educational researchers and theorists about the relative value and necessity of interaction (both academic and social) in online courses centers on the apparent incompatibility of an emphasis on interaction with the convenience and autonomy that have traditionally served as the hallmark of the online format. From its inception, online distance learning has been hailed for its ability to offer "anytime, anywhere" learning for people with busy lives who might, otherwise, be unable to access higher education. The convenience afforded by online classes is, therefore, not only manifested as geographical independence (through not having to commute to a physical campus) but also temporal independence (giving students the ability to engage in academic activities when their schedules permit). Some researchers have argued that online course designs that emphasize and/or require interaction among students can interfere with this autonomy in managing the time, place, and pace of learning. These authors take exception to the notion that "more is always better" when it comes to interaction in online learning (Kramarae, 2003; Coork, 1989; May, 1993). Such considerations have led some organizations, such as QualityMatters.org and the American Council on Education, to note in their online course design guidelines and evaluative rubrics that course designers should strike an appropriate balance between concerns for learner autonomy and concerns for learner interaction. This leaves open the question, however, of what balance is "appropriate."

Several researchers have examined the relative value of learner independence and interaction, either directly or indirectly as they have studied learner experiences in online courses. For example, Dutton, Dutton and Perry (2002) conducted a group comparison

study using a causal comparative design (students self-selected into online or f2f sections of the course under study). The researchers found that students who chose the online option valued convenience and flexibility more highly than they valued contact with their instructor or fellow students and that the reverse was true of students who chose f2f. Thompson and McGrath (1999), studying course evaluation data from Penn State's World Campus program, found that creating online programs that meet both the convenience and interaction needs of learners can not only be done but yields highly satisfied students. The researchers noted how comments from students in the program suggested that online students highly value convenience (a way to overcome barriers to campus) yet also value quality (resulting from the development and application of real learning communities). In another study, Valenta, Therriault, Dieter and Mrtek (2001) used "Q-methodology" (a hybrid of quantitative and qualitative techniques) to study the values of 74 students from the University of Illinois Chicago who were taking their first online class. Their results revealed three general value groupings: (1) Time and Structure in learning, (2) Social Interaction in Learning, and (3) Convenience in Learning. The researchers found that class participants fell into one of the three groupings because they highly valued one of the three value sets yet were neutral on the other two. Groups 1 and 3 seemed to value two different aspects of convenience/independence/autonomy in online learning, namely time management (for group 1) and flexibility of the place of learning (specifically, the ability to learn from home) which was key for group 3. Students falling into group 2, by contrast, highly valued social interaction but were neutral on having geographic and temporal autonomy.

This research supports the notion that differences in student values and preferences are related to their needs in online learning and therefore affect their likelihood of persistence and success in online classes.

Addressing this issue from a broader perspective, Tam (2000) says that online learning forums should generally support the seven principle values of constructivism: Collaboration, personal autonomy, generativity, reflectivity, active engagement, personal relevance, and pluralism). Citing findings from numerous studies, Tam notes an array of online learning strategies that support constructivist learning, such as actively engaging students in authentic problem-solving or collaborative efforts. In recommending collaboration, however, Tam acknowledges the conflict between collaboration and personal autonomy in this environment and the unresolved question of whether they can coexist. In the final assessment, however, Tam concludes that online communications can and must support both collaborative learning (content communication) and social support in order to be effective, and can do both without overly compromising personal autonomy. This position provides a prescient summary of the issue, as discussed thus far. While not every online class need incorporate interaction in order to be effective, and while many (if not most) students who currently choose online classes value the autonomy and convenience the online format affords them, it is clear that many students value social interaction with people so highly that the presence or absence of this one factor can have a dramatic impact on their learning experience, and therefore on their persistence in an online class.

The juxtaposition of learner autonomy and learner interaction in online learning should come as no surprise to online course designers given that online learning largely caters to adult learners and given that these concepts are consistent with numerous leading models of adult educational programming. For example, Knowles' (1980) concept and model of andragogy, whose concepts underpin many of the more current models of adult educational programming, has as one of its core tenets the value of self-directed learning, allowing adult learners to take control of their own learning. At the same time, however, andragogy recommends the utilization of experiential learning techniques that allow adult learners to share and build upon their experience, such as role plays, collaborative simulations and discussions, all of which presuppose learner interactions. Cyril Houle's (1972) model of adult educational programming, while acknowledging the value of self-direction, places a much stronger emphasis on social interaction and relationship building among learners, instructors and programmers, noting that mutual emotional support among learners can enhance morale and aid in learning. This tug of war between the value of learner autonomy and the view of education as a "cooperative art" is seen, at varying levels, throughout the literature on adult educational programming (Caffarella, 1998; Merriam & Caffarella, 1999; Sork, 1997; Brookfield, 1986).

The literature on motivation to learn, especially as it pertains to adult learners, also yields insight into how learner independence and interaction fulfill differing learner motivational needs and require different learner skills or attributes. For some time online learning researchers have turned to self-regulation theory for guidance concerning student

motivation in online classes. Self-regulation theory addresses the strategies, values, and skills that students employ to motivate and direct their own learning, especially in the absence of external structures and forces that compel student learning behaviors. The application of self-regulation theory to online learning is a natural extension of the emphasis on learner autonomy and independence commonly associated with online courses. Researchers have examined how self-regulation manifests itself in online courses and its impact on student learning experiences (Williams & Hellman, 2004; Whipp & Chiarelli, 2004), and having noted that self-regulation skills positively impact learner experiences and outcomes in online courses, researchers have also investigated those elements of online course design and implementation that foster self-regulation among learners (Niemi, Nevgi, & Vertanen, 2003; Parry & Dunn, 2000; Perry, VandeKamp, Mercer, & Nordsby, 2002). This growing literature applying self-regulation theory to online learning presupposes an online learning landscape in which interaction is minimal and students must function more independently than they would in a traditional course. Self-regulation theory is not the only segment of the student motivation literature that has application to online learning, however, and some other lines of theory speak to the importance of establishing social interaction in online classes.

As noted in Chapter One, self-determination theorists have posited that one essential element of a student's intrinsic motivation to learn is a need for "relatedness" with others. According to this view, students seek meaningful connections or relationships with others in a class, program, and or institution and the building of these relationships enhances their motivation to learn. On the other hand, students who do not

have their need for relatedness met do not find the learning intrinsically motivating and may fail to persist in the absence of strong extrinsic motivational factors (Baumeister & Leary, 1995; Brophy, 1992; La Guardia & Ryan, 2003; Ryan & Deci, 2000). This concept is echoed by Wlodkowski (1995, 1999) who stresses the importance of inclusion as an element of his model of motivation to learn geared specifically toward adult learners. According to Wlodkowski, students who feel a sense that they are included and respected in the activities of the class and who feel a connection with their classmates experience greater intrinsic motivation to learn than students who feel isolated, disrespected and excluded from the classroom community.

In *How People Learn: Brain, Mind, Experience and School,* Bransford, Brown, and Cocking (2000) likewise cite research indicating that learners of all ages are more motivated to learn when they have social opportunities that provide the "feeling that one is contributing something to others" (p. 61) than when they do not have such opportunities. Huba and Freed (2000), in establishing their framework for learner-centered assessment in postsecondary educational settings, also make reference to the fact that learning is an interpersonal activity. "With this approach," they say, "college courses become settings in which personal and professional relationships develop between us and our students and among the students themselves. . . Courses become communities of learners" (p. 60). Even Brophy (1998) in establishing guidelines for motivating students of all ages to learn devotes an entire chapter to establishing the classroom as a learning community. Says Brophy, "You can increase the power of your motivational efforts by attending to your students' social goals as well as their academic goals" (p. 26).

This concept from the student motivation literature concerning the motivational value of social interaction to students in online classes has broad support in the online learning literature. Building on the studies noted previously which have focused on linkages between interaction in general and learner outcomes, numerous studies have more specifically identified a link between social interaction and learner satisfaction and performance in online classes. One example, as described above, is the mixed methods study of student values in online courses done by Valenta, Therriault, Dieter and Mrtek (2001) which revealed that students who place a high value on interaction with their instructor and with their peers and who are low on self-regulation may demonstrate higher rates of attrition than their peers in online classes that do not support meaningful social interaction. Wegerif's (1998) study, also described above, likewise demonstrates the connection between social interaction and student satisfaction and outcomes in online courses. In studying learner experiences in an online course, Wegerif found that students who achieved a sense of inclusion with their peers through social interaction were more likely to succeed in the online class than students who did not. In another case study, Brown (2001) found that students who interacted socially with one another and who, through that interaction, moved from mere acquaintance with one another to a sense of inclusion and then to a sense of camaraderie, were more engaged in the class (participated more) than students who lacked these interactions and failed to develop such relationships. Likewise, Jung, Choi, Lim and Leem (2002), in a study designed to assess the impact of different kinds of learner interactions (academic, collaborative, and social) on student participation, outcomes and satisfaction in an online course, found that groups

which engaged in social interaction showed higher achievement scores than the other two groups, suggesting that social interaction has a positive influence on learning outcomes. The researchers also found that the collaborative and social interaction groups showed higher participation rates than their peers in the academic interaction group, as measured by the number of posts made to the online discussion forum. The results of these and other studies (e.g. Guawardena and Zittle, 1997; Kanuka and Anderson, 1998) provide strong evidence of the notion that social interaction has a positive impact on learning in online courses distinct from the influence of other kinds of interaction.

Sense of Community

Many researchers investigating the impact of social interaction in online classes have begun to focus on a concept called sense of community as the factor which social interaction promotes among students which meets their relatedness needs and promotes satisfaction and motivation, and the absence of which leads to dissatisfaction, lack of motivation and failure to persist. Sense of community, as defined by McMillan and Chavis (1986), is "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p. 9). The sense of community construct and the broader concept of learning communities and their role in the classroom are not new and has been applied to traditional learning for some time. Only in recent years, however, as researchers have begun to move beyond the presumption that online learning cannot foster social interaction, have researchers begun to examine the concept of sense of community as it applies to online learning. Setting the stage is Brent Wilson (2001),

who, in a position piece, notes that a sense of community in online classes, while potentially challenging to create given the modes of communication used in such classes, is possible and a valuable component in the success of online learning programs. "Establishing a construct of 'sense of community' –then routinely designing for, supporting, and assessing this outcome in online learning . . . can significantly contribute to the experience of online learners," says Wilson. He then goes on to recommend several specific supports for building sense of community in online courses, including the use of extended opportunities for collaboration, the use of user-friendly communication tools, and building an environment of mutual respect among class participants.

Carrying the discussion further, Brown (2001) employs a grounded theory design in examining how community forms in an online course, focusing on the conditions, strategies, actions, and phenomena that frame, support, and affect community building in the class with the intent of building a theory. Data were collected from interviews with the 21 students participating in online courses and these data were then subjected to thematic content analysis. From the resulting themes, Brown concluded that learners progress through levels of community as the course unfolds, starting with making acquaintance and topping out with forming a sense of camaraderie. Not all learners progressed through all of these levels, and not all experienced a sense of community in the class, but students with more experience in online learning progressed through the levels more easily and in greater numbers than did their less experienced peers. Brown found that the process of community building involved students gaining a comfort level with the software tools used in the course, assessing their own individual progress in

comparison with their peers, finding similarities with classmates and then evaluating the extent to which the online class interaction was meeting their individual needs.

Students in Brown's study decided how much time and effort to allot to class interaction based on how much reward they received for their efforts, and those that made substantive contributions were the ones who progressed beyond the acquaintance level and developed mutual trust and respect through mutual engagement. Brown further noted that as engagement with the class dialogue grows so does engagement with the class itself and a sense of community conferment or inclusion comes as engagement reaches a maximum, wherein discussion contributions grow longer and more personal. Brown's findings are consistent with those of Chidambaram and Bostrom (1996) and Wegerif (1998) who noted in their studies of interaction in online classes that students progress through critical stages toward a group identity and failure to complete that progression yields students who feel like outsiders rather than as part of the group. The key to crossing the threshold between stages identified in both studies was social interaction, suggesting that social interaction is the mechanism for building sense of community among learners.

In order to assess the degree to which online classes foster sense of community, Rovai (2002a) developed the Classroom Community Scale, an instrument for measuring sense of community in classroom settings. Through administering a 40-item prototype of the instrument to 375 students participating in 28 online courses, Rovai confirmed the reliability and validity of the instrument, and also observed a significant gender difference, with females reporting a far stronger sense of community than their male

counterparts. Rovai contended that these results were consistent with models suggesting that females place a stronger emphasis on relationships and value cooperation versus competition more highly than do males in classroom settings. The author notes, however, that he made no effort to control for either course design, instructional delivery, or instructor (which may have varied wildly across the 28 courses included in this study).

With a functional instrument in hand, Rovai and Jordan (2004) conducted a quantitative study comparing sense of community between a fully traditional, fully online, and blended or hybrid course in which the researchers hypothesized that sense of community would be highest in the blended course. Using the Classroom Community Scale and a causal comparative design, the hypothesis was confirmed and the researchers added that participants in the blended course reported feeling more connectedness with their peers and reported stronger perceptions of learning than did their peers in the other two conditions. However, they were quick to note that their study, like Rovai's prior one noted above, could not control for several potentially confounding variables, including course instructor and course content, which were different for each setting.

In another mode comparison study, Rovai, paired with Wighting and Liu (2005) used a causal comparative design to compare a group of students participating in an online course section with their counterparts enrolled in a face-to-face section, this time with respect to sense of community not only as it relates to the immediate class, but also as it relates to the entire school or institution. The researchers hypothesized that while classroom sense of community might be similar for both groups, sense of institutional community should be lower for the online group. The results indicated, however, that the

online group was significantly lower in both kinds of sense of community, as measured by the Classroom Community Scale. The researchers noted that they were unable to control for student factors that might differ between students that self-select into online sections of a class versus students who choose a face-to-face section.

In yet another causal comparison study, Rovai and Lucking (2003) compared sense of community between a traditional and distance education section of a course. The instructor and course design were kept constant, but one section of the course was taught in an on-campus classroom while the other was conducted via interactive television. The results indicated that the students in the traditional section of the class experienced significantly stronger sense of community than did their peers in the tele-learning section. The researchers noted that these results do not necessarily confirm that distance learning classes are incapable of supporting a sense of community that is comparable with traditional classes, but rather suggest that those designing and implementing distance learning classes must do far more than simply move traditional course pedagogy to a distance format if they wish to foster sense of community in distance education courses. Likewise, these findings suggest that researchers must do more than simply compare sense of community between online and f2f course delivery methods.

Rovai (2002b) addresses this concept more fully in a position paper on how best to promote sense of community among learners in online classes. Rovai begins with the premise that the online medium employed in the instructional design is rarely a significant factor in how effectively the class supports community building and suggests

that course design and pedagogy are the keys. He then calls upon the educational research literature to delineate seven factors that are positive correlates to and which influence the development of sense of community in online courses. One is transactional distance, Moore's (1993) construct defined as the psychological space between learners and instructors which Moore describes as a function of the degree to which control over the class is exercised by the instructor versus the students. As instructor control increases, transactional distance increases while the reverse is true as student control increases. Another factor identified by Rovai is social equality, which is equal participation among students, while another is an emphasis on small group activities, such as keeping class sizes small or breaking classes with large numbers of students into smaller work groups. A match between the pedagogy employed in the class and the degree of self-direction or self-regulation skill possessed by the students is another important factor, according to Rovai, as is active facilitation of community building on the part of the instructor. The seventh factor is a construct called social presence, discussed below.

Building on these ideas, Rovai (2002c) utilizes yet another causal comparative design, but this time not only to assess the difference in sense of community between an online course and a face-to-face course, but also to serve the larger purpose of identifying best practices for promoting community in online courses. In this study, data included the Sense of Classroom Community measure, the actual messages posted to the online discussion board, and statistical data maintained by the Blackboard system. There was no significant difference in sense of community between the online and face-to-face

treatments, however, the researcher notes that no effort was made to control for instructor or course design (differential pedagogy) effects. While the number of posted messages was moderately, positively related to the sense of classroom community reported by participating students, this factor only accounted for 18% of the variance in the sense of community scores, leading the researcher to speculate that instructor immediacy, amount of learner control, and other variables may account for some of the unexplained variance. Rovai concludes from this study that teachers and designers of online classes should take care to promote "socio-emotional-driven interaction, such as exchanging empathetic messages, encouraging self-disclosure, and discussing the backgrounds and interests of learners" (p. 53) to promote connections among learners that foster sense of community.

Approaching the same issue from a qualitative perspective, Ludwig-Hardaman (2003), conducted a case study of a four-week online student orientation class, utilizing survey data, interviews, and direct classroom observation to ascertain the design strategies used in the course to support development of community. The researcher's findings indicated that in order for community to develop, the media or communication tools implemented in the class must support multiple modes of communication (synchronous and asynchronous communication), organization, document sharing, and subgroup formation. The findings also indicated that online learning community development must be guided and supported by the instructor and institution in order to succeed. Even then, such efforts will fail unless the students are persuaded of the value of participating in an online community to their educational endeavor.

Expanding on this work, Wilson, Ludwig-Hardman, Thornam, and Dunlap (2004) address how to facilitate learning communities in online courses, identify seven features of online courses that support online community building, and incorporate them into a simple instrument for measuring sense of community in online classes. The seven features include the establishment of shared goals among students, ensuring a safe and nurturing environment that can foster the development of mutual trust and respect among course participants, and providing boundaries and a structure that promotes the establishment of a group identity. In addition, the researchers indicate that community development requires high levels of social interaction and collaboration among learners, respectful inclusion of all learners, progressive discourse and mutual appropriation which taken together are roughly equivalent to the concept of academic, content-related interaction described in previous sections which promotes the social construction of knowledge. The researchers note that each of these elements requires an active role for the teacher who must maintain a strong presence in the class in order for community to grow (teaching presence).

Along a similar vein, Haythornthwaite, Guziec, Robins and Shoemaker (2000), in a paper presented at the 2000 Conference of the Association for Library and Information Science Education, reported on their qualitative assessment of the "insider's view" of what "community" means to students participating in online learning. Their report described how students characterize community in an online class and how instructors and course designers can promote community in such classes. To gain the insider's view, the researchers conducted extensive interviews over the course of an entire year with

students participating in online classes at the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign. These classes used both synchronous (chat) and asynchronous modes of interaction, and almost all of the students reported a strong sense of community. That sense, according to the researchers, was initiated through the establishment of interpersonal ties generated through face-to-face orientation sessions, which lead these researchers to emphasize the importance of design elements that promote early bonding among students. The strength of students' sense of community was related to how much effort and energy they put into the online interaction. Those students who put forth the effort felt their sense of community persist, but those that did not felt isolation and distress. The researchers noted that as participation wanes, students can "fade" from the community, so they recommend that instructors actively encourage participation from their students as the course progresses. In addition, these authors found that synchronous communication contributes more to community building than does asynchronous communication, indicating that the use of online media that support synchronous communication is a worthwhile component of online learning despite the adverse impact it has on the "convenience" afforded by the class.

The Impact of Media

As the body of research has grown establishing a connection between social interaction and a sense of community among learners, both of which can positively impact upon student persistence and learning experiences (if not outcomes) in online classes, researchers have begun exploring factors that may impact on the development of

social interaction in online classes with an eye toward maximizing sense of community. Much of this research has pointed to two main factors of instructional design in maximizing both constructs: Pedagogy and media. Beatty (2002), for instance, emphasizes the importance of incorporating design elements relating to learning goals, values, conditions and outcomes that facilitate social interaction in online classes. Built on online instructional theory and an examination of an array of case studies on online learning, Beatty offers a framework of those design elements and methods which engage learners in social interaction and that online course designers should consider when designing online learning environments. Beatty then applies the framework in the development of a set of guidelines for online course design which have implications for both pedagogical and media choices. In like manner, Wegerif's (1998) case study (referenced above) revealed two factors that were seen as positively contributing toward the development of social interaction in an online course. The first was the spatial metaphor of the system used as the forum for online discussion and the second was the structured group activities utilized in the course design, reinforcing the idea that both medium and pedagogy are important factors in facilitating social interaction in online learning. Based on these findings, Wegerif concluded that a strong sense of community is a prerequisite for collaborative learning and that social interaction is the key to forming it.

Another study echoing the importance of medium in facilitating online social interaction is Ellis' (2003) study of how personality type relates to student learning experiences in online courses. Ellis studied 33 students enrolled in a hybrid course by

examining the Myers Briggs Type Indicator score for each student, the messages on the online discussion forum, daily forum logs, and in-class observations and found two main factors that influenced student interactions. First, Ellis says the structure and expectations of the course must be established and communicated to learners at the beginning, providing a context for interaction. Also, synchronous and asynchronous communication are needed to achieve a "human connection" among students and between students and the instructor. Approaching the use of media another way, Woods and Ebersole (2003)**,** in their naturalistic case study of students participating in online courses at Regent and Indiana Wesleyan University, examined the impact that non-subject matter discussion folders, geared primarily toward social interaction, can have upon students' sense of community. Their results revealed that while the students felt that multiple, specialized non-subject matter forums might be excessive, the use of at least some personal or social discussion folders of this kind can have a positive influence on learners' development of a sense of community and their overall level of satisfaction with their learning experience. In a similar study, Yeoman (1995) describes her efforts to establish an informal online gathering place dubbed "Sam's Café" as a forum for academic dialogue among students and between students and teacher. The researcher's goal was to promote collaborative learning through collective journal writing in this online forum. However, she found not only that the "Café" promoted high quality academic discourse, but that it also served as a place for community building among students through which they provided mutual support to one another, suggesting once

more that media can have a strong influence on social interaction and sense of community.

Finally, Poole (2000)**,** in her case study of student participation in an online course, found that "the web-based delivery medium did not inhibit the development of the class as a community. In many ways, it actually contributed to the formation of a cohesive group" (p. 175). Because nonverbal cues were absent in the online medium, students made a conscious effort to use one another's names and maintain the connection with one another in the online forum, helping to foster trust. Based on her observations of this class, Poole concluded that trust is an essential element of online communities and that instructors must take care to facilitate its development if they want community to develop in online courses. But is the notion offered by Poole and the other researchers noted herein that the online medium itself might positively impact upon social interaction and sense of community supported by theory and observation?

The debate concerning the impact of technological media on learning predates the arrival of the Internet and has been argued extensively within the educational research literature. This debate was encapsulated during the late eighties and early nineties in the exchange of articles between Clark (1983, 1985, 1991, 1994) and Kozma (1991, 1994), the former asserting that media have no notable impact on learning and the latter arguing the reverse. Clark argues that numerous quantitative analyses have established that medium has no significant effect on learning and that, therefore, there is no medium whose utilization might serve to increase learning. This position serves to debunk those who over history have pointed to each new emerging technology as the next to

revolutionize education and to make students learn better than ever. In the other camp stands Kozma who counters that media, when properly paired with sound pedagogy, can significantly enhance learning. This position is consistent with the broader "media richness theory" of Daft and Lengel (1986) which states that the communication potential of media differ based on their relative ability to convey information and cues among participants. According to this theory, the face-to-face classroom conveys the greatest amount of information and cues among people and is, therefore, the "richest" medium, whereas text-based online media, such as email, are relatively "lean."

The emergence of online learning paired with the exponential growth of media which can now be utilized to exchange information online has led researchers studying online learning to revisit this time-honored issue. Wagner (1994), in her article addressing a functional definition of interaction, uses the term "interactivity" to describe the degree to which an online medium supports interaction among students, suggesting that different technologies vary in their potential to facilitate interaction among students and between students and teacher. For instance, Wagner notes that technologies vary with respect to the type and immediacy of feedback they support and also with respect to the methods of presenting course content and information that they support. These two factors alone, according to Wagner, can significantly impact on the quality and nature of interaction in a course. Simonson, Smaldino, Albright, and Zvacek (2000), expanding on Wagner's ideas, cite the degrees of realism (abstract vs. concrete) and communication capabilities (one-way vs. two-way) as additional aspects of media that can impact on interaction in online courses. Another media factor that has been cited as having an

impact on student interaction online has been whether the employed media support synchronous and/or asynchronous communication. Ellis (2003), as noted above, found that the use of media which support synchronous interaction was a key factor in promoting social interaction in an online class, and several other researchers have noted an impact of synchronous versus asynchronous communication on various aspects of learning (Levin, He, & Robbins, 2006; Bonk, Hansen, Garbner-Hagen, Lazar, & Mirabelli, 1998; Im and Lee, 2003). While the debate over the effects of media on learning may not yet be fully settled, the prevailing position among those who design and assess the quality of online courses appears to be that instructional designers and teachers, and the institutions that monitor them, should ensure that their online classes incorporate a variety of media that are appropriate to the content areas and pedagogy employed in the class (Quality Matters, 2005; California State University, Chico, 2003; Monterey Institute for Technology and Education, 2005; Keinath & Blicker, 2003). Yet central to the current study is a media-related construct that has received a great deal of attention in recent years: Social-presence.

Presence

Before one can explore the construct of social presence, one must understand the concept of presence from which it is derived. As advances in technology have permitted the development of virtual, interactive environments, ranging from simple text-based emulations to highly complex, 3-D graphical interfaces that completely immerse a user in a simulated world, researchers began to explore the nature of the experiences people have while interacting with these technologies. These studies revealed evidence that users

frequently reported a sense that they were actually in a place interacting with other people while using such virtual environments, rather than merely interfacing with others via technology from a distance. Such findings gave rise to the concept of presence, defined as "the perceptional illusion of nonmediation," a phenomenon in which "a person fails to perceive or acknowledge the existence of a medium in his or her communication environment and responds as he or she would if the medium were not there" (Lombard, Reich, Grabe, Bracken, & Ditton, 2000, p. 77). Over time this concept of presence has been refined to differentiate the constructs of physical presence (the sense that one is actually in another place, rather than interacting with technology) and social presence (the sense that other intelligent actors are also present and interacting with a person using a virtual environment). In this view, if physical presence is the perception that "I am there" then social presence is the perception that "we are there together" one experiences when interacting with others in a technology-mediated world (Lee and Nass, 2001).

Much of the early and ongoing research into virtual reality systems has focused on physical presence, how it is defined and measured, what factors influence it, and how it can be maximized in online and other computer-based environments. Almost a decade's worth of research from the leading authorities in the field has yielded the conclusion that the degree to which users experience presence in a virtual environment is impacted by factors intrinsic to that environment and by factors intrinsic to the user (Witmer and Singer, 1998; Lombard & Ditton, 1997; Lombard, Reich, Grabe, Bracken, & Ditton, 2000; Sheridan, 1992; Slater & Usoh, 1993; Lee and Nass, 2001). Among the former are ease of equipment use (Barfield & Weghorst, 1993), fast response rates to user

input (Held & Durlach, 1992), quality and resolution of the display (Held & Durlach, 1992; Barfield & Weghorst, 1993; Bocker & Muhlbach, 1993), inclusion of sound (Steuer, 1992; Gilkey & Weisenberger, 1995), modifiability of the environment (Sheridan, 1992), and the degree to which the medium is unobtrusive (Lombrad & Ditton, 1997). Among the user variables that impact on presence are the time spent interacting with the environment (Held & Durlach, 1992; Loomis, 1992), comfort and experience with technology, especially with the medium in use (Held & Durlach, 1992; Loomis, 1992; Lombard & Ditton, 1997), the degree to which the user can focus on the environment (to the exclusion of distractions) (McGreevy, 1992; Slater & Usoh, 1993; Witmer & Singer, 1998), and the user's willingness to suspend disbelief (Lombrad & Ditton, 1997). Clear among these findings is the implication that media differ with respect to the degree to which they convey presence to their users.

Social Presence

The dimension of the presence construct that has been of more immediate interest to educational researchers in recent years is that of social presence. At the outset, it is important to note that the term "social presence", like the term "interaction," has a wide range of usage within the media, communications, and education literatures with some authors treating it as a characteristic of a medium (Waldeck, Seibold, & Flanagin, 2004) and others treating it as a characteristic of the interactions between people in online settings (Rourke, Anderson, Garrison & Archer, 2001). Most researchers now conceptually define social presence as a state of perception or a sense of "being with others" in a mediated environment, when one is actually only interacting with those

others at a distance. More specifically, social presence is a state of perception or experience on the part of technology users including mutual awareness and psychological involvement with one another (in the form of intimate and immediate interaction) (Biocca, Harms, & Burgoon, 2003). The concept of social presence was originally introduced by Short, Williams, & Christie in 1976, well before the onset of the online learning phenomenon, as a means of assessing the degree to which telecommunications technologies could bridge distances between people for various kinds of productive activity, including teaching and learning. Their basic presumption was that media differ with respect to how well they promote a sense of social presence and they sought to examine characteristics of media that facilitate the development of social presence among users (indeed, they developed an instrument to do just that). In the same vein, one of the first and most basic questions addressed by online learning researchers with respect to social presence has been whether or not social presence can take place in online classes, and what factors influence its occurrence. With regard to the former question, numerous studies have determined that students can and do experience social presence in online educational settings (Picciano, 2002; Lobry de Bruyn, 2004; Savicki & Kelley, 2000) including settings that are purely text-based (Rogers & Lea, 2005).

As to those factors that influence the development of social presence, Rogers and Lea (2005), in evaluating the development of social presence in a text-only, online learning environment, found that social presence could be enhanced through the use of pedagogy which emphasizes the development of a shared social identity among students. On a broader scale, this research suggests that social presence is a function not only of

media characteristics but also of teaching and learning strategies employed in the class. Bracken, Jeffres, and Neuendorf, (2004) demonstrated in a study of students' responses to computer-generated feedback (praise or criticism) that social feedback can enhance social presence among students, even when that feedback is generated by a non-human (computer) actor within the environment. Again, this suggests that any medium that permits immediate, social feedback between participants may be capable of generating social presence among learners. Savicki and Kelley, (2000) echo the theme that social presence is a function, not only of medium, but more of the interaction between the medium and the learning activities employed therein as evidenced by the fact that learners within a text-based online environment could experience social presence when the communications employed therein were geared toward maximizing the social cues and immediacy. Kreijns, Kirschner, Jochems, and Buuren (2004), go even further in proposing that social presence is influenced not only by characteristics of the medium and the pedagogy employed within an online course, but also by characteristics of the learners themselves (though they do not specify what learner characteristics would enhance or detract from social presence).

In addition to these elements, Tu (2001; 2002) suggests that social presence is also impacted by the degree to which the medium conveys a sense of privacy to participants (as higher privacy promotes stronger social presence), and allows immediate feedback (synchronous interaction enhancing social presence compared with asynchronous). Tu also suggests that the user's familiarity and comfort level with the computer technology involved in participating in online learning influences the degree of

social presence experienced by the learner, implying that proper training for students is essential to maximizing their social presence and learning experiences online. Lombard and Ditton (1997), in addition to addressing variables that impact on physical presence, cite several factors that influence social presence including the number of people involved in a virtual encounter (having more than one person obviously has an impact on social presence), and the social realism of the environment (those elements of context and communication that are consistent with non-mediated experiences and "ring true"). From these studies it appears evident that social presence, like presence, can be characterized as either a function or as a characteristic of a medium. In either case, these two constructs appear to have much to offer with regard to our understanding of how media impact on student learning experiences online.

Relationships Between the Constructs and Literature Gaps

While initial research on interaction, presence, social presence, and sense of community has explored each of these constructs in isolation, in recent years, educational and media studies researchers have begun to examine how these constructs relate to one another, and how they combine to impact upon student learning experiences online. One example of such a study from the media research literature comes from Nowak and Biocca (2003). In an experiment, these researchers examined the impact of the manner of representation of other actors in a virtual environment on a user's sense of physical presence. Their results suggested that when people interacted with a partner represented by any visible image in the virtual environment, they felt a stronger sense of presence than if the partner was not represented by a visual image. Also, interestingly, they found

that visual representations of the partner that were less anthropomorphic evoked stronger presence among users than did those that were more human in appearance, suggesting that designers of virtual environments should consider not only using visual representations of actors but also representations that are different from what is expected in order to maximize presence among participants. Underlying both findings, however, was the notion that interaction with others in an online setting can have an influence on one's sense of presence in the environment. Tu (2001), studying how Chinese students in an online learning experience perceive social presence, also found that the level of interaction among students facilitated by the class is strongly related to their sense of social presence. Hence, while Tu recommends that those designing online courses carefully consider which online media to employ, as the capabilities of the media impact on participants' sense of social presence, he also strongly encourages the facilitation of interaction through appropriate learning tasks.

In another study, Tu and McIsaac (2002) used both quantitative (administration of the Computer Mediated Communication (CMC) Questionnaire with exploratory factor analysis) and qualitative methods (participant observation with dramaturgy) to examine student perceptions of social presence in an online course. While replicating many of the findings indicated above, the researchers also noted a reciprocity to the relationship of social presence and interaction: Each positively reinforcing the other. Based on their findings the researchers concluded that social presence is an important quality in an online class for fostering online social interaction, and as social interaction takes place in an online course, students' perception of social presence rises. Gunawardena and Zittle

(1997), in a study of the usefulness of social presence as a predictor of learner satisfaction in an online course, found a significant positive relationship between these two concepts. Similarly, Picciano (2002) studied the relationship between interaction, social presence, and students' actual and perceived performance in an online class and found "a definite, consistent and strong relationship among student perceptions of interaction, social presence, and learning" (p. 30). The relationship between perceived social presence and actual performance was mixed, however, with performance on a written assignment significantly, positively correlated with social presence, while the correlation between social presence and performance on an examination was not significant.

In yet another study, Selverian and Hwang (2004) conducted a qualitative analysis of seventeen research studies on virtual learning environments in search of patterns among relationships between technologies, pedagogy, physical and social presence and learning. The researchers found that high social and physical presence were related to the achievement of learning objectives, with social presence being affiliated with the achievement of higher-level learning objectives in interactive learning environments. Finally, Shin (2002**)** conducted a study indicating that the construct of transactional presence (which is very similar to social presence as characterized by Shin) serves as a significant predictor of online student achievement, satisfaction and persistence and is strongly related to interaction.

Based on these findings, it seems clear that the constructs of interaction, presence, social presence, and sense of community are bound up among one another, mutually influencing one another and mutually impacting on student learning experiences. Also, it

appears clear that the media through which online courses are delivered, in conjunction with the pedagogical strategies and tasks employed and the characteristics of the participants in the class, do have an impact on each of these constructs. The reviewed literature then suggests that online course designs that employ a combination of media and pedagogy which promotes presence, social presence, social interaction, and finally, a sense of community among learners, will minimize student isolation and attrition and positively enhance student satisfaction and learning experiences. Two things are not clear from the existing literature, however. First, it is not clear how these four constructs relate to one another and mutually affect one another in an online learning setting. While numerous studies have examined these constructs individually, and some studies have examined the relationship between two of them, there are no studies that have attempted a comprehensive examination of the relationship between all four. Secondly, no studies as of yet have examined the impact of alternative media usage (the use of media other than the traditional asynchronous discussion forum) on student learning experiences in terms of these four constructs. The present study sets forth to address both of these questions by clarifying the relationship of these constructs to one another and to students' overall learning experiences in online classes within the context of one particular alternative online learning medium: An Object-oriented, Multi-user domain or MOO.

A MOO was selected as the medium to be studied because of their growing use in online education, their reputation for promoting rich interpersonal exchanges among students, and the relative dearth of structured literature assessing their impact on learning (O'Day, Bobrow, & Shirley, 199; Jacobson, 2001). MUDs and MOOs are relatively

simple, text-based environments that are "virtual realities" in that they offer users a simulated world with which and within which they can interact and communicate in real time. This online world emulates the physical world in that it is comprised of representations of buildings, rooms and other simulated "places" through which and within which users navigate (Peterson, 2001).

A consistent theme emerging from the literature on educational uses of MOOs and MUDs is the characterization of them as "social spaces" and that characterization as central to their effectiveness as learning environments (O'Day, Bobrow & Shirley, 1998; Jacobson, 2001; Looi & Ang, 2000). This characterization is well represented by O'Day and her colleagues when they say that such environments "offer places for people to be together. Even when virtual worlds are sites for work-related activities . . . they are overwhelmingly social and open-ended in nature" (p. 315). The use of the word "places" in this description is intentional, as a common theme echoed by those who have described using a MOO or MUD in their online teaching is that these environments emulate actual spaces and have characteristics of effective learning spaces consistent with the literature on physical classroom settings (Van Note Chism & Bickford, 2002; Jamieson, 2003). The characterization of student interactions in MOO settings as described in the existing literature suggests that these environments promote social interaction and social presence and may even foster the development of sense of community among learners (Peterson, 2001). Unfortunately, most of the literature on educational use of MOOs and MUDs offers only anecdotal descriptions of their social characteristics without any formal conceptual definitions of these constructs or analysis

of their impact on student motivation or learning experience. The present study seeks to fill this gap in the literature by examining the interaction and experiences of students taking an online course via a MOO in terms of the four constructs of social interaction, presence, social presence, and sense of community.

CHAPTER III

METHOD

As indicated in the preceding chapters, in this study the researcher seeks to depart from the effectiveness comparison studies comprising the No Significant Difference literature and to, instead, explore and gain an in-depth understanding of one particular online learning phenomenon and the processes that drive it. As such, this study differs from the preponderance of research comprising that literature both in terms of its questions and its methods. As noted at the end of Chapter 1, the questions guiding this study are not questions of "which is more" or "which is better" between different course delivery modalities and media. Rather, the questions are "how" questions concerning the manifestation of constructs and the processes through which those constructs and the online media through which they manifest themselves mutually influence one another in shaping student learning experiences. These are not questions to be answered primarily through the gathering of quantitative data and the running of statistical analyses. As indicated by Mertens (1998), research questions such as these that seek detailed, in-depth information about how a program or practice functions may lend themselves better to qualitative than quantitative methods. LeCompte and Schensul (1999) agree, saying "for such questions, [qualitative methods] are appropriate because they allow us to assess and describe what really is happening after all, as well as what has been happening over time rather than at one point in time, or 'pre and post'" (p. 83). These questions lend

themselves to the prolonged engagement, thorough examination, and thick description of an ethnographic research design.

This study approaches an in-depth understanding of how the use of an online virtual environment impacts on student learning experiences through detailed and thorough examination of particular instances of the use of this technology in a natural setting: The higher educational classroom. To understand the processes that shape the phenomenon being examined and to frame that understanding in terms of the conceptual framework suggested by the literature, this study employs data collection techniques that are well associated with ethnographic research, such as field observation and interviewing. However, the proper description of a research method as ethnographic requires more than simply using the tools of the trade. As described by LeCompte and Schensul (1999), ethnographies differ from other kinds of studies in that they always include in their focus the culture of the group or entity under study as they seek to find out what is happening in a program and why we observe the outcomes from a program that we do. In the current study, the constructs that serve as the filter for the data collection and analysis, especially social interaction and sense of community, are highly cultural in nature, further pointing to the appropriateness of ethnographic methods to the study of the phenomenon in question.

The Setting

Since the phenomenon to be studied centers on online learning experiences by college students, the researcher selected four classes conducted at a public, comprehensive doctoral university with high research activity in the southeastern United

States, all employing two distinct online media for online instruction: A traditional asynchronous discussion forum (Blackboard 7.0) and a synchronous virtual environment called a Multi-User Domain, Object-Oriented (MOO). Specifically, these classes employed an Encore Xpress MOO (version 3.3.3) which incorporates both textual and graphical elements to simulate real-world spaces and environments and to allow real-time, synchronous communication among users. Through user inputs, such as the keying of text and the clicking of icons with the mouse, users can transmit information to both the MOO environment and other users logged into the environment and receive immediate feedback, generated by either a fellow user or by the MOO itself (for more information about the Encore Xpress MOO system, see http://www.accd.edu/sac/english/lirvin/AlaMOO/AlaMOOGuide/interface.htm).

All four classes (subject classes) studied herein were hybrid or blended classes in that they employed some combination of face-to-face and online learning, and all four utilized both the MOO and an asynchronous online discussion forum. The four classes come from two different programs at their university, two from Counseling and Educational Development (counseling) and two from Specialized Education Services (special ed). Within their respective programs, however, the four classes functioned quite similarly, each being part of a two-class sequence covering back-to-back terms (special ed was fall-spring, counseling was spring-summer) that is mandatory for students pursuing a degree within that program.

Each of the two-class sequences was taught by the same instructor, though the counseling sequence utilized different co-instructors from term to term whereas both

classes in the special ed program were taught by a solo instructor. That solo instructor in the special ed classes was an adjunct faculty member whose primary vocation is as a private practitioner in her field, whereas the primary instructor in the counseling class sequence was a tenured professor at the university. There are several other notable differences. Both classes in the counseling class sequence were taught primarily online via a combination of MOO and Blackboard (with a heavy emphasis on the MOO setting) except for a single face-to-face meeting at the start of each term to provide orientation for the students. During the first class in the counseling sequence examined for this study, taught in the spring of 2006, the class met 12 times in the MOO and had weekly Blackboard posting assignments to complete between class meetings. In the subsequent summer session, the class met nine times in the MOO and likewise had intervening Blackboard posting assignments. By way of contrast, the special ed program used a more even mixture of face-to-face meetings and online learning, placing an emphasis on the former. For instance, the first class in the sequence, taught in the fall of 2006, included five online classes (out of fifteen weekly meetings), one of which was conducted in MOO and the other four on Blackboard. The remaining 10 meetings were conducted face to face. Likewise in the spring of 2007, the second course in the sequence included four online meetings (one in MOO and three in Blackboard) with the remaining eleven meetings occurring in the traditional classroom. Another key difference between the two programs concerns their student demographics. The special ed classes and the program of which they were a part were for undergraduate students pursuing a Bachelors degree with teaching licensure. The counseling classes and the program from which they come,

on the other hand, were for graduate students, people who are practicing professionals in their field who have already completed a masters degree program and who are seeking a Post-Masters certification.

Pedagogically, the four classes examined in this study were quite similar in design, if not in implementation, despite the differences in their use of media. Syllabi for all of the classes placed an emphasis on discussion and underscored the importance of class participation, suggesting that participatory learning and group interaction were important parts of the learning process. Both instructors also emphasized the importance of contributing to the discussion in all class settings (Blackboard, MOO and face-to-face meetings) and with some overlap between the three learning forums. For instance, in the counseling classes the instructor assigned Blackboard discussion assignments/prompts for students to address during the time between each MOO class session, such that discussion was taking place synchronously at least once per week and asynchronously throughout the course. The special ed instructor employed a similar tactic, carrying over face-to-face or MOO class session topics into the intervening week using the Blackboard asynchronous forum, but unlike the counseling instructor, did not assign a Blackboard discussion to take place between every class meeting. Assignments for the four classes included papers, professional planning documents (such as lesson plans for the special ed classes and group counseling plans for the counseling classes) and application activities.

The four subject classes were selected as the setting for study first and foremost because of their use of the MOO virtual environment as a forum for online learning. This particular virtual environment software has been described anecdotally by

instructors employing it in their online classes as a "social setting" and as having a positive influence on community building among class participants (O'Day, Bobrow, & Shirley, 1998), a phenomenon experienced directly by this researcher (as described in Chapter IV). As such, the first criterion for selecting subject classes for this study was that they utilize a MOO system in the online component of their course delivery. This criterion proved to be one of the most difficult to fulfill, given that the use of the MOO environment as a forum for online learning, while becoming more common, is still relatively rare in higher educational settings. The second criterion for selection was that the classes include the use of an online forum other than the MOO in the online component of their course delivery. This second forum was desirable to allow for a form of negative case analysis within each class through the observation of participants' online class interactions via more than one medium. Rather than for determining which was "better" or "more effective" through statistical comparisons, the purpose for including a second forum was to assist in establishing a more thorough context for understanding the behaviors observed in the MOO. The final criterion was that the class conduct a substantial portion, if not all of its meetings, online.

Ideally, the researcher would have identified classes conducted entirely online via the MOO and one or more other media, but the relative scarcity of classes incorporating a MOO in their teaching at the time of this study made it necessary to consider classes utilizing a blended or hybrid approach. As such, a course was considered to have a substantial portion of its meetings online if at least a fifth of the class meetings were conducted in an online forum. In the end, the researcher selected four classes employing

a combination of face-to-face meetings, a virtual environment and an asynchronous online forum, two of the classes meeting face-to-face only once, and the other classes meeting in the virtual environment only once.

At the outset of this study, the substantial differences between the four classes, and the relatively small proportion of the special ed classes that were taught online loomed large as potential weaknesses to this study, especially given that the research design did not call for observation of the face-to-face portions of the subject classes, since the focus of the research was online learning experiences. However, during data analysis it became clear that the numerous differences between these subject classes and the fact that they included face-to-face meetings serves an important role in adding value to the study. Having some diversity among the class settings to be observed strengthens the transferability of the findings resulting from those observations that are consistent across the four class settings. In other words, if a finding is noted as occurring in both the counseling classes conducted almost exclusively in the MOO and the special ed classes which utilized only one MOO session per term, then that finding takes on potential applicability to a far wider array of settings than would be the case if all four settings were identical. Likewise, the differences between the classes provide the opportunity to temper and qualify findings that are not consistent across the settings to deepen the resultant understanding of the processes and phenomena being studied. Going back to the example above, a finding strongly noted in the very MOO-oriented counseling classes but that is completely absent in the contrasting special ed classes could suggest a duration or repetition effect that would bear further investigation. In addition, the fact that all of

the classes met face-to-face but to differing degrees also plays an important role in contextualizing the findings from the observations of the online portions of each class, even though the actual face-to-face meetings were not observed for the study.

The Participants

The participants in this study were selected solely because of their election to enroll in one or more of the subject classes and for no other reason. As such, students who successfully enrolled in one of the subject classes were invited to participate in the study without regard to any other factor (race, gender, socio-economic status, etc.) and no enrolled student who consented to participate was excluded from the study. No effort was made to control for preexisting variables such as previous experience with computers or previous experience taking online classes (though these were assessed during participant focus groups and interviews). Of the 12 students enrolled in the two counseling classes studied for this project, 11 consented to participate. The contributions of the twelfth student to the online MOO and Blackboard transcripts were removed prior to data analysis. The impact of that removal on the findings and conclusions of the study are addressed in Chapters IV and V. The eleven participating students consisted of 10 women and one man. While specific age and race data were not collected, information disclosed by the students in the class transcripts revealed this to be a diverse group in terms of both. Unlike the counseling classes, the student population did not remain constant across the two special ed classes. Seven of the 16 students enrolled in the fall class did not participate in the spring, and three students who had not participated in the fall class were given permission to enroll in the spring class, joining the nine students

who carried over from the fall. Of the 16 students enrolled in the fall class, 11 consented to participate, while all 12 of the students from the spring term gave consent. The total participant pool from the two special ed classes was 14 consisting of one man and 13 women. Age and race data were not obtained, though again, disclosures from the class transcripts revealed that the classes included students of both traditional and non-traditional age for undergraduates. In addition to the students participating in the subject classes, the researcher also interviewed the instructors of the subject classes including the two graduate assistants who co-taught the counseling class sequence with the tenured professor.

Entering the Field

Because of the digital nature of the MOO and Blackboard online environments, the distinction between field observation data and archival data is somewhat blurred, which in turn obscures the traditional concept of entering and exiting the field. In both the MOO and Blackboard environments, the entirety of the class proceedings comprised of the sequential textual contributions from all of the class participants are recorded within the system and can be viewed later. Because the class proceedings contain no content other than what can be digitally reproduced through these records, an observer analyzing the records has essentially the same "experience" of the class as a party to the class proceedings as they unfolded in real time. This is qualitatively different from a transcript of a recording of a face-to-face session which is a description of what was said in the class but which does not reproduce every element of what transpired in the class (such as posture, facial expressions, and other non-verbal data). Indeed, the digital

record of a MOO or Blackboard class session is more analogous to a video recording of a face-to-face classroom session than a transcript of the same face-to-face class. To be as thorough at reproducing the classroom experience of real-time class participants as a MOO or Blackboard transcript, however, the video recording of a face-to-face class would have to capture the entirety of the information (verbal and nonverbal) exchanged between participants – every wink and nod and yawn.

In the present study, the researcher officially entered the field in the spring semester of 2007. At that time, three of the four subject classes were already complete while one was still underway and finished in May of 2007. However, the researcher gained access to the digital records of all online class sessions conducted in the subject classes throughout the term in which they were conducted, allowing field observation of class sessions that occurred prior to the actual date of entry. As noted above, face-to-face class sessions were not observed from any of the four subject classes as they were not the focus of inquiry for this study, though some information about the nature of the face-to-face meetings and their role in each class was obtained through the focus group and interview sessions.

Data Collection

The primary data collection procedure for this study consisted of field observation of online class sessions conducted in the virtual environment (MOO) through analysis of online class records, as described above, from the point of entry through the end of each course. Field observation of the asynchronous discussion forum was also conducted for each subject class, in like manner, for use as a form of negative case analysis to assist in

interpreting and contextualizing the findings from the MOO observations. In addition, the researcher collected data through semi-structured focus group and interview sessions with key informants. Specifically, the researcher first conducted a focus group session with five of the students from the counseling class series on April 26, 2007. The focus group participants were selected based on their having consented to participate in such a group and based on their availability to participate during the period in which the study was being conducted. Next, the researcher conducted a focus group session on May 30, 2007 with the primary instructor of the counseling series and the two graduate assistants with whom he had co-taught the two classes reviewed for this study. Finally, the researcher conducted an interview on June 7, 2007 with the instructor of the special ed series. All three sessions were conducted in the MOO environment thereby allowing participants to gather at a distance and thereby creating verbatim textual records of the proceedings. No focus group session or interviews were conducted with any of the special ed students because none of them consented to participate in such a session. Rather, these students elected to participate only through allowing the researcher to analyze their online class transcript contributions, a method of participation that required no time commitment on their part. The interview protocol (Appendix B) is grounded in the conceptual framework guiding this study, centering on the constructs of social interaction, presence, social presence, and sense of community. The specific wording of the interview protocol questions was adapted from published instruments developed by Kreijns, et al. (2004) and Burgoon and Hale (1987) (social interaction), Witmer and Singer (1998) (presence), Tu (2002) (social presence), and Rovai (2002) (sense of

community) (see the data analysis section below for more details on the measures and applicable operationalizations).

Data Analysis

The field observation data and interview data were subjected to content analysis assisted through use of the Microsoft's Word and Excel software applications. The analysis protocol (see Appendix C) was, again, derived from the conceptual framework guiding the study and was adapted from published operationalizations and conceptualizations of those constructs. With respect to the presence construct, the session transcripts were examined for language consistent with the conceptual definition, specifically language through which the participants described their experience or their actions in terms of being in a place rather than using technology. In addition, the transcripts were examined for indications of presence consistent with the Witmer and Singer (1998) Presence Questionnaire. These included indications of the degree to which the virtual world, rather than the real world, was salient to participants during the sessions and indications of the degree to which the virtual experience rather than the technology was salient to the participants. The manifestation of the social interaction construct was assessed in terms of Burgoon and Hale's (1987) topoi of relational communication which include language that conveys immediacy and affection, depth and similarity, equality or dominance, formality or informality, composure or tension, and receptivity and trust. Like presence, social presence was assessed both in terms of the conceptual definition (through identifying language consistent with that definition) and an operational definition, the latter through an adaptation of Tu's (2002) Social Presence and Privacy

Questionnaire. Tu's instrument and the model that inspired it chart three groups of indications of social presence: Indications that users perceive the online forum as a social environment, indications that users perceive the language used in the online forum as social in nature, and indications that the class activities are social in nature. Finally, the sense of community construct was assessed in terms of Rovai's (2002) Classroom Community Scale, which focuses on indications of trust, mutual reliance, comfort, and interest in learning. In addition, the Blackboard and MOO sessions were examined using Microsoft Word and Excel to ascertain descriptive numerical data concerning posting patterns including posting volumes and posting frequencies.

The rationale behind the data collection and analysis methods selected for this study mirrors the broader rationale supporting the selection of a qualitative research design: The research questions guiding the study necessitate a focused, yet exploratory method of examining the subject phenomenon. Through employing data collection methods that gather rich, comprehensive information about the subject phenomenon, and analysis techniques designed to identify the themes arising from those data, the manner in which the concepts under study manifest themselves and influence one another in the subject classes was discerned. The use of multiple, similar but distinct class settings as data sources, in turn, permitted the identification of repetitive and redundant findings and themes, strengthening the transferability of the findings and conclusions drawn from the data. The emerging themes were then used to inform a model of how the conceptual constructs work in tandem to influence student learning experiences in online course sessions conducted via a virtual environment. In addition, these data collection and

analysis techniques lend themselves to quality assurance protocols designed to fortify the overall integrity of this study.

Quality and Integrity Protocol

In order to maximize the academic quality and utility of this study and its findings, the data collection and analysis methods employed herein incorporated a comprehensive quality and integrity assurance protocol consistent with the writings of Lincoln and Guba (1985). To ensure the credibility of the findings, the research employed prolonged, substantial engagement and persistent observation of class activity over the course of two consecutive academic terms and through multiple delivery modes (virtual environment and asynchronous discussion forum). This approach minimized the possibility that the observed behaviors and phenomena were unusual and therefore not representative of how participants and informants actually behaved and perceived the phenomena under study. In addition, the research employed triangulation of data sources (MOO class transcripts, Blackboard discussion forum records, and focus groups with class participants and instructors). To further enhance credibility, the researcher employed peer debriefing and member checks, consulting with members of the dissertation committee as well as with participants in the study concerning observations, themes, and conclusions while the study was in progress and making adjustments to the study protocols in response to this feedback. Also, the examination of a mode of student online instruction other than the virtual environment, namely the asynchronous discussion forum, served as a form of negative case analysis. The ability to examine how the subject constructs manifested themselves in another setting with the same participants

informed the interpretation of findings from the observations of the MOO proceedings. Finally, the researcher engaged in progressive subjectivity throughout the research process, fully disclosing the preliminary construct model and personal biases at the outset of the study, and recording how that model developed in light of case observations as the study progressed.

Equally important to credibility, the dependability and confirmability (Lincoln & Guba, 1985) of the findings were reinforced not only through the progressive subjectivity described above, but also through the use of complete and detailed disclosure of the entirety of the research process from start to finish. As noted above, the researcher initially delineated the assumptions, premises, and biases that framed the context of the study and noted how those changed as the study progressed. In framing this discussion of the progressive subjectivity of the study, the researcher thoroughly detailed how the data collection and analysis protocols and methods described herein were applied, the results they yielded, and the logic linking these methods and resultant data to the conclusions drawn. The researcher also described in detail how the quality and integrity assurance protocols were applied and how their application impacted on the ongoing logistics and conceptual interpretation of the study.

Alongside credibility and dependability, a qualitative study must also take steps to strengthen its transferability (Lincoln & Guba, 1985), that is, the degree to which the findings and conclusions apply not only to the settings observed during the study but to other settings. In other words, studies with strong transferability have implemented strategies that reduce the likelihood that the phenomena, processes, and behaviors

observed are unique to the specific situation observed, thereby increasing the value of the knowledge gained from the study to educational practitioners who may want to apply it elsewhere. The present study reinforces transferability through examining multiple, diverse data sources in the form of four different class settings that utilize the MOO online learning forum in similar yet distinct ways. Because the four settings are different from one another in numerous substantial ways, such as the proportion of the class delivered online versus face to face, or the proportion delivered online via MOO as opposed to online via Blackboard, themes and findings that are redundant across settings within the study have greater transferability than findings from any one setting in isolation.

The final quality assurance issue facing qualitative studies such as the present project, and addressed by this protocol, is authenticity, described by Mertens (1998) as the presentation of a balanced view of all perspectives, values, and beliefs. To address this issue of fairness, the researcher has taken care to include and give equal weight to the viewpoints of all study participants and informants, both those which tend to support the initial conceptual model under investigation and those which tend to reject that model. Care toward the issue of fairness was a point of emphasis in both peer debriefings and member checks, encouraging both parties to identify instances where the research appeared to emphasize one or more viewpoints to the exclusion of others or appeared to minimize or ignore certain viewpoints in favor of others. Mertens also refers to two other components of authenticity: Ontological and catalytic authenticity, which concern the manner and degree to which participant viewpoints were informed and participant actions

were stimulated by their participation in the study. Yet, because most of the study participants did not know they were being observed for a study at the time of their class participation (the transcripts were reviewed retrospectively) and most did not participate in any real-time aspects of the study, the prospect of participants being affected by their participation was deemed too small to warrant investigation. As such, ontological and catalytic authenticity were not addressed.

With regard to ensuring the integrity of the data, the researcher avoided conflict of interest by keeping the instructors blind with respect to the identity of students who were participating and those who were not. The instructors were, therefore, not present during the participant focus group and had no access to the research materials. Participants were made aware that the fact or manner of their participation in the study would have no impact whatever on their grade for the subject courses or any other class at the subject university. The researcher, in consultation with the dissertation committee, securely maintained all research materials and removed identifying information in order to preserve the anonymity of the participants. Any references to participant names contained in this document are fictitious.

CHAPTER IV

RESULTS

Presumptions, Biases, and Subjectivity

As stated in the preceding chapter, before addressing the findings of this study, we must first begin with the past and establish a context for the progressive subjectivity of the researcher: Me. Having begun my undergraduate studies during the final years in which students still typed their term papers on typewriters (albeit, electric ones) and having nearly completed my final graduate degree in a time when entire degree programs can be completed via a computer screen, I have directly experienced how advances in computer technology have dramatically changed the higher educational experience for students. Throughout my studies, I have embraced these technological changes and quickly become proficient as I have a high comfort level with technology, and more specifically, with computers. My undergraduate honors thesis was composed in a very early DOS version of Microsoft Word on a shared computer at a student center and stored on a 5 ¼ inch floppy disk that is actually floppy. I didn't actually own my own computer until a few years after finishing my undergraduate degree: A Wang 386SX running Windows 3.0 purchased in 1992. In the late 1990's I became acquainted with the Internet and quickly latched onto the wonder of the World Wide Web, spending hours "surfing" around and discovering what was out there. I felt very much like Alice who had just descended down the rabbit hole into an entirely new world.

It was during my Masters program that I first encountered online learning through the use of the TopClass system. At that time, classes at my Masters institution were using the asynchronous discussion forum available through TopClass to augment what were primarily face-to-face classes. It was a new concept to me: In lieu of coming to class some weeks, I could stay home and discuss issues with other students online. I immediately took to these online discussions and looked forward to reading, posting, and then seeing what people had to say in response to my posts. It wasn't until enrolling in the doctoral program that has prompted this dissertation that I took part in my first fully online class, conducted entirely via asynchronous discussion forum (in this case, Blackboard). Like many of the students described in the online learning literature, I initially experienced the sense of isolation commonly associated with fully online classes, though I overcame this sense and had a successful class experience. The journey toward this research project began in earnest, however, in the spring semester of 2002 as I was taking an online class on the subject of electronic community in preparation for this degree. The class began like my previous online class, with all student and instructor interaction taking place via an asynchronous discussion forum. About halfway through the course, however, the instructor began conducting class sessions on Lingua MOO, an object-oriented, multi-user domain operated by the University of Texas at Dallas. Suddenly the class was transformed. While up to that point, the interactions among class participants were cordial, well thought out, and interesting, they suddenly took on a social quality that had been previously lacking. The class identity subsequently changed. Everyone felt more immediate, more tangible, more real, and more personable. I felt that

I knew the participants better and the feeling appeared to be mutual. A class about electronic communities was becoming a community in ways that were different than when we were interacting exclusively via the asynchronous forum. The introduction of a different online learning medium had generated a new dynamic in our class, and this prompted the question of why and how.

In the aftermath of this class, I began to explore the online learning literature, seeking explanations for the phenomenon I had experienced. As indicated in my literature review, my search focused in the areas of media and its impact on learning, interaction in online learning and its functions, and social communication and community building. Not finding the specific issues on which I was focusing to have been directly explored, I redirected my efforts toward identifying constructs in the literature that could serve as a conceptual framework for conducting my own study of the phenomenon and this dissertation project took shape. My literature review also informed the development of a model for how the relevant constructs and theories I had identified might be interacting to produce the phenomenon I had experienced. The presumptions underlying both my literature review, the design of this study, and the initial model, as graphically represented in Appendix D are:

1. The media employed in an online class can have a substantial impact on student learning experiences. Using Herzberg's (1966) terminology, media are not hygiene.

2. The degree to which class participants experience a sense of physical presence is largely a function of the media employed in the class (and to a lesser extent, a function of characteristics of the student).

3. Media that emulate real spaces or convey a spatial theme enhance presence among class participants

4. A sense of physical presence sets the context for and positively reinforces social interaction and social presence

5. Social interaction and social presence in a class are influenced by a combination of media and pedagogy employed in the class (and to a lesser extent, characteristics inherent to the student and the instructor)

6. Social interaction and social presence mutually reinforce one another as a class progresses

7. Over time, the mutual growth of social presence and social interaction gives rise to sense of community among class participants

8. As sense of community strengthens among class participants, so does satisfaction, sense of learning, and likelihood to persevere.

As noted in these presumptions and in the literature that informs them, the instructors in any class, no matter how it is conducted, bring their own set of unique characteristics, attitudes, and experiences that substantially shape the learning experience for everyone involved. More specifically, several studies and models of online learning indicate that the instructor's attitude about and comfort with computers and technology has a direct impact on the learning experience of students enrolled in their classes. With this in mind, an important distinction must be noted between the two primary instructors of the subject classes with respect to their attitude toward the use of the MOO in their teaching. The counseling instructor, from his first introduction to the MOO environment,

embraced it with great enthusiasm and has made the MOO the centerpiece forum for the delivery of the two-class series being studied herein. His advocacy has resulted in the use of MOO being incorporated into other online courses in the Post Masters Certification program of which the two classes studied herein are a part. The special ed instructor, by way of contrast, initially approached the use of the MOO more cautiously and somewhat reluctantly, preferring the asynchronous discussion forum as an online forum, but incorporating the MOO into her teaching anyway because she recognized the value of conducting some class sessions synchronously but at a distance. The relatively small number of class meetings conducted in the MOO by this instructor is reflective of this hesitancy. Nevertheless, this same instructor is considering promoting the use of MOO as a means of offering elements of the special ed curriculum at her institution to practicing professionals who cannot commute to on-campus classes.

Another important consideration that must be addressed before delineating the findings of this study concerns the limitations of the MOO transcript materials which served as one of the primary data sources for this project. While the MOO records were substantial for these four classes, they were not entirely complete. The MOO transcripts only reflect those MOO sessions or portions of MOO sessions during which the instructors had the recorder turned on. The recorder, when on, captures all of the activity taking place in the MOO room during the session. With the recorder off, however, everything said and done in the session is lost after the session ends. In most of the sessions studied for this project, the instructor started the recorder at or shortly after the official start time of the session, thereby recording all of the content from the formal

session and omitting only some of the greetings and informal conversations taking place prior to the beginning of the class content. Most of the transcripts include substantial portions of this informal gathering time. However there were two instances over the course of two terms where the instructors in the counseling series failed to turn on the recorder until well into the class proceedings, and there was one session in the spring counseling class that was not recorded at all. While these omissions are not insignificant, their impact is mitigated by the consistency of the findings from the existing recorder transcripts and the corresponding material from the focus group sessions both of which suggest that the likelihood of highly divergent material in the omitted portions of the MOO proceedings is quite low.

Another bias note and a limitation of the current study concerns voices that were not included in the study. As mentioned in Chapter III, one of the key integrity control responsibilities for a researcher conducting an ethnography is to ensure the authenticity of the findings through representing all voices within the community being studied. Unfortunately, however, that responsibility is overridden by the responsibility to only include the voices of those that provide their informed consent to participate. In the present study, the researcher began with a pool of 35 potential participants: Twelve students and three instructors in the counseling classes and 19 students plus one instructor in the special ed sequence. Despite repeated attempts, however, only 11 of the counseling students and 14 of the special ed students consented to participate, meaning that six voices – five from special ed and one from counseling – had to be excluded from the data analysis described hereafter. Were this a survey study (overlooking the

ridiculously small N) an 81% participation rate would be considered quite good. However, in an ethnography, the absence of voices raises the concern that some perspectives were omitted, thereby tainting the findings and the resulting conclusions.

One control that helps to mitigate the adverse impact of absent voices lies in the nature of the data used in the study. Though a lack of informed consent required that the contributions to all online discussions of those non-consenting students be omitted prior to analysis, the transcripts still contained the comments, questions, and replies of consenting participants directed toward the omitted material that reflected the nature of the omitted contributions. These "reflections" permitted the researcher to ascertain the tone and (in some instances) partial content of many of the non-participants' comments thereby preserving, at least in part, their voice. At the very least, the reflections of these omitted comments evident in the remaining material suggest that at least some of the omitted contributions exhibited many of the same characteristics and followed some of the same trends as the data that underwent analysis and from which the findings below are derived. The one other safeguard against tainted authenticity from absent voices lies in the use of triangulation and member checks as integrity control methods. Though none of the non-consenting students were directly involved in either of the focus group sessions or member checks conducted as part of this study, their peers who interacted with them during the class proceedings were. If triangulation and member checking worked as they are intended, they should have revealed inaccuracies in the findings brought on by the absence of excluded voices. In other words, should the researcher have drawn conclusions based on the transcripts that inaccurately represented the participation

of a non-consenting student, either the focus group responses or the member check feedback should have identified the inaccuracy. An important limitation to this safeguard and to the study overall is the fact that no focus group was conducted with the special ed students. At the outset of the study, none of the special ed students who consented to participate expressed a willingness to take part in an interview or focus group session, preferring to merely allow the researcher access to their portions of the online class transcripts. How this absence of special ed focus group data impacts upon the conclusions of this study is addressed more fully in the next chapter.

The final limitation and bias note to be brought forward is the fact that none of the f2f class proceedings in any of the four subject classes were reviewed for this study. The reasons for this were in part logistical as three of the subject classes were already over when this study commenced, and none of their face-to-face sessions were recorded, thereby preventing field examination of these sessions. However, the primary reason for the omission of the f2f sessions was conceptual. This study seeks to examine qualities of online learning on their own terms without concern to comparing them to a f2f forum. Of much more interest to this researcher and to the current project are comparisons, not between online and f2f, but between the two online forums used in all of the four subject classes. This is not to suggest that information about the f2f content of each subject class was not sought or useful. In fact, a great deal of information about the f2f class meetings in all four subject classes was obtained through the online class materials and interview/focus group communications with participants. Rather than serving as a basis for establishing comparisons, however, this information about the contents of the f2f

sessions served to establish a context for interpreting and understanding the online class session content reviewed for this study. With these biases and subjectivity issues delineated at the outset, the findings from the study can now be addressed.

Contextual Findings from the Four Subject Classes

The Counseling Classes

The two-class counseling cycle observed for this study began on January 12 in the spring semester of 2006 when the students and instructors met on campus at the university for an opportunity to meet one another for several hours and to receive an orientation to the class syllabus and an orientation to both the MOO and Blackboard systems. This would be their only face-to-face meeting of the term (they would also meet face to face once at the start of the summer term), and though it was not observed for this study, the students made casual reference to it as an enjoyable and beneficial get together in their initial round of Blackboard posts later that same day and later that same week. The focus group participants also underscored the importance of the face-to-face meeting in helping to pave the way and set the tone for the interactions online that were to follow in each term. Said one student, "We got to meet each other and I think that helped us feel a little more comfortable the first time we were online together." Another student placed even more value on the face-to-face sessions, saying she "would not have wanted to do an online program without having the face-to-face meetings on occasion despite a 3 hour drive each way – too valuable to miss." As evidenced by comments made both in the MOO, Blackboard and during the focus group session, the students varied considerably in terms of their comfort and experience level with computers, online technology, and

online communication customs, such as the use of abbreviations like “LOL” for “laughing out loud” and emoticons such as “:)”. Most of the students had relatively little or no prior experience with online learning, and those that had taken prior online classes had not previously used a system like MOO, though some had used an asynchronous discussion forum akin to Blackboard and others had used synchronous communication systems similar to chatrooms. Faced with these new technologies, many of the students reported a mild to moderate level of stress at the beginning of the first course, though the reported stress levels diminished as that course progressed. It was also evident that for some, if not most, of the students this was their first “graduate school” experience in quite some time, which prompted expressions describing a mixture of eager anticipation and anxiety (mostly the former) from many of them. The instructors, by contrast, were both very familiar with and comfortable with online interaction, and the use of all of the technologies employed in the course, having had considerable prior experience with such tools.

In addition to their varying degrees of experience and comfort levels with online technology, another theme evident from the class transcripts was that the counseling students varied considerably in terms of their professional experiences. Some of them had practiced primarily in elementary school settings, some in middle, and some in high schools, while others had experience in multiple school level settings. These differences were addressed frequently throughout the two classes as students shared their own experiences with one another in MOO and Blackboard class discussions. The students also varied with respect to their familiarity with the other program participants prior to

the start of the first class. Most reported having had no prior contact with any of the course instructors and little to no prior contact with any of the other students. Four of the students were all working in the same county school system during the time of the classes and thereby knew each other prior to the course, while a few others had either previously worked or studied together. Most of the students were unfamiliar with one another prior to the start of the first class, however, and many of the students had no prior contact with any of the other course participants. This is not to suggest that the participants were completely heterogeneous, however. As pointed out by one of the counseling students during their focus group, the fact that they were all practicing professionals within the same field established a basic context of mutual understanding that facilitated the discussion.

After the initial on-campus class meeting, the class participants entered into what would be their regular routine for the remainder of the semester: A weekly, two-hour meeting (roughly 4:00 pm to 6:00 pm) in the MOO with intervening weekly Blackboard posting assignments. After each weekly MOO meeting, the instructors would post a prompt to the Blackboard discussion forum with a topic related to the past week's MOO session and/or the coming week's session and the students would then respond to the prompt during the intervening week prior to the next MOO session. The same pattern continued in the summer except that the truncated schedule required multiple MOO and Blackboard sessions per week. Attendance was strong throughout both terms (despite summer travel commitments during the summer term) with 100% attendance (excluding consideration of the one student not participating in this study) in 7 of the 11 recorded

spring class online meetings and 5 of the 9 summer class online meetings. No more than two students were absent from any single online class meeting in the spring (this happened one time at the end of the term) and usually only one student was absent, if any. Likewise in the summer term only one student was absent in each of the four meetings with less than 100% attendance. In each term 7 of the 11 participating students attended all of the MOO meetings and 5 of those students attended all 20 of the recorded class meetings. Likewise, all 11 students regularly participated in the weekly postings to Blackboard throughout both terms, though occasionally a student would forget to post to Blackboard or would post after the due date. When it comes to showing up, participation was the order of the day, and nonparticipation was the exception rather than the rule.

Each MOO session recorder log has a time stamp when the recorder is started and stopped which allows for assessment of the duration in real time of each session. The spring counseling class sessions ranged from a minimum of 72 minutes (this was the initial online meeting which was intentionally kept short by the instructor) to a maximum of 120 minutes. It must be noted that one of the spring class session logs was missing the time stamp at the beginning of the session, thereby making it impossible to calculate the duration of this session. The mean across the 10 remaining recorded spring counseling class sessions was 104.1 minutes. The nine summer class session logs ranged from a minimum duration of 67 minutes (this was one of the sessions where the recorder was started late so some material at the beginning of the session was omitted) to a maximum of 122 minutes. The mean duration for class sessions during the summer was very consistent with that of the spring at 104.4 minutes. The MOO recorder logs also identify

each post during the recorded session by the username of the contributor, thereby permitting the counting of the total number of posts and the number of posts per participant. It must be noted that the counts cited herein do not include the number of posts made by any student who did not consent to participate in the study, but only include the counts for the 11 counseling students who did consent to participate. Total post counts during the 11 recorded spring counseling sessions ranged from a low of 688 (again, in the first, shortest meeting of that term) to a maximum of 989 in the sixth meeting of that term. The mean post volume for the spring term was 831 posts per session. In the summer term, the post counts ranged from a low of 518 (again, in the log shortened by failure to activate the recorder timely) to a high of 952, again in the middle meeting (the fifth) of that term. Individual student mean post volumes ranged from a low of just over 40 posts per session to a high of 101 posts per session in the spring. The mean student posting volume across all spring MOO sessions was 60.1 with a standard deviation of 20.8. The mean post volume for the summer classes was 753, but this figure was artificially deflated by the shortened log in Session 2 of the summer term. Nevertheless, even with removal of this outlying session, yielding a mean post volume among the remaining sessions of 783, the mean post volume in the summer classes was slightly below that of the spring. Individual mean student post volumes for this term ranged from a low of 31 posts per session to a high of 89. Interestingly, the student with the highest mean post volume was the same in both terms while the student with the lowest post volume was not the same across terms. The overall student mean post volume across all summer MOO sessions was 47.6 with a standard deviation of 16.5.

Complete posting data from the spring counseling MOO sessions are shown in Table 1 while data from the summer sessions are shown in Table 2, both contained in Appendix A.

The availability of both post counts and session duration data for these classes permits the calculation of post frequency information which gives a snapshot of the overall pace of each session in terms of posts per minute of elapsed real time. Again, it must be noted that since the post count totals did not include the posts of the one student who did not consent to participate, the frequency figures cited here hold true only for the 11 students and two instructors (plus two guest speakers in the summer sessions) who consented to participate in this study. In the spring term the MOO session pace (or post frequency) ranged from a low of 6.31 posts per minute in the penultimate session to a high of 9.54 posts per minute (or a post every 6.3 seconds) in the very first (and shortest) session of the term. This first session had the highest post frequency not only of the spring but also of the entire two-class series, making it the fastest paced class of the 20 counseling sessions examined for this project. It must again be noted that because of the lack of a starting time stamp in session 7 of the spring term, neither the duration nor the post frequency could be calculated for that session. Adjusting for this omission, the mean post frequency among the remaining 10 spring class sessions was not quite 8 posts per minute or a post every 7.5 seconds. The summer class sessions ranged in post frequency from a low of 5.70 posts per minute (a post every 10.5 seconds) in session 7 to a high of 8.65 posts per minute (or roughly one post every 7 seconds) in session 5. The mean post

frequency across the nine summer term sessions was 7.2 posts per minute (or a post every 8.5 seconds), slightly slower than in the spring.

If serving no other purpose, these figures illustrate that in these MOO class sessions, with student and instructor posts coming onto the screen at a pace of roughly one every 7-9 seconds, course participants had to read relatively quickly in order to keep up. In fact, keeping up with the pace of the sessions was a commonly cited concern among the students as revealed during the sessions themselves, in the Blackboard posts, and during the focus group. In the very first MOO session, for instance, one of the students said, "[I'm] nervous about keeping up once we really get going," and another said, "I'm getting dizzy reading all these messages." In a Blackboard session in the summer, a student wrote, "I couldn't keep up and that may have been because I was thinking more about what everyone else was saying rather than communicating myself. " Similarly, in the student focus group session, one of the students said "The downside, like the others mentioned, is that it WAS difficult to keep up with all the 'talking' and to respond when you really wanted to sometimes." This was also one of the challenges of teaching in MOO cited by all of the instructors interviewed for this project. Said one of the counseling graduate assistants, "I definitely felt like I needed some Advil after my first MOO experience . . . keeping up with multiple lines of conversation." The primary instructor of the counseling class series added, "There is a LOT of information and discussion to keep up with."

The Special Ed Classes

Turning to the Special Ed classes reviewed for this study, the two-class sequence began in fall of 2006 with an initial, face-to-face class meeting on August 15. The students, all undergraduates, were entering the first semester of their junior year and were embarking on what, for most of them, was the first class in their major course of study. As a result, while some of them likely had taken some liberal studies classes together, this was their first class together as a group that would be moving together for two semesters before branching into two subspecialties within the deaf education program at their university. The class met face to face on campus for the next four weeks and then had it's first online class, conducted in Blackboard on September 19. The class met twice more in the face-to-face classroom over the next three weeks and then had its only MOO class session of the term on October 17, which the instructor supplemented with a Blackboard assignment. The following two class meetings were conducted face to face and on Blackboard, respectively, then the final four class meetings were held face to face on campus.

The second term of the two-class special ed sequence began in the spring semester of 2007 with an initial, on-campus meeting on January 11. As noted in Chapter 3, seven of the students from the fall class did not enroll in the spring term and three students who were not enrolled in the fall received special permission to take the spring class out of sequence, thereby joining the nine returning students. The second class meeting was conducted online (via Blackboard) on January 18 and the students returned to the traditional classroom the next week on January 25. Over the next four weeks, the

students met twice face to face, met once online (Blackboard class) and had one independent project in lieu of a class meeting, assigned through Blackboard but involving no online discussion. Two subsequent face-to-face meetings were then followed by a Blackboard online class, another face-to-face class, and then the only MOO class of the semester. The semester was then concluded with three additional face-to-face classes.

The instructor of the special ed classes (according to her own account, as obtained through a personal communication on May 8, 2007) utilized a mixed pedagogy in the face-to-face class meetings, including lecture, facilitated discussion, multimedia presentations, and collaborative learning activities. Because all students in these classes were assigned to a 45-hour practicum placement in an actual school setting each semester (to observe in the fall and apply their newly learned skills in the spring), the instructor indicated that she would begin each class session with a discussion of what was happening in the practicum placements. She would then cover the day's topic with a brief lecture supplemented with slides, charts or video presentations. She would prompt for discussion among the students about the topic and how it applies to their practicum placement and then she would direct the students in a collaborative learning activity, having them practice application of the newly covered material in pairs or groups in the classroom. "They were not a very talkative group to begin with," said this instructor, "and I had to be pretty direct to get them to get involved in the discussions in [the first term]. But during the spring the discussions came more freely as they became more confident with the information." This instructor used the online Blackboard component of the course as an opportunity for students to apply the class materials individually (as

opposed to the collaborative applications that were the norm f2f), to review others' applications of that material, and to obtain feedback from their peers about that application through colleague responses. The special ed instructor used the online MOO sessions, on the other hand, primarily as a means of disseminating information at a distance in a manner that allowed her to address questions and generate discussion about the material. As she said in her interview session, the addition of MOO to just using Blackboard, "has provided variety, excitement over trying something new, flexibility, and ease of providing power point presentations"

In the two special ed class MOO sessions, one conducted in the fall and one in the spring term, attendance was mixed. In the fall term, 7 of the 11 students participating in this study attended the session (3 of the 4 that did not attend contacted either the instructor or a peer during the session indicating they were unable to log in, leaving only one unaccounted for). The spring session was better attended with 10 of the 12 enrolled students participating. The fall session lasted 82 minutes and included 257 posts (excluding the posts from students who participated in the session but did not consent to participate in this study), yielding a post frequency of 3.13 posts per minute (or a post every 19 seconds). The spring session was longer, lasting 104 minutes, and included 404 posts yielding a slightly faster pace of 3.88 posts per minute (or one post every 15.5 seconds). Complete posting data from the special ed MOO sessions are shown in Table 3, found in Appendix A. Quite obviously, these posting frequencies are considerably lower than the mean posting frequencies of the counseling MOO sessions noted above in which the students contributed more than twice as many posts per minute. Of course, the

counseling MOO sessions had more participants on average over the course of two terms (13 in total including 11 students and 2 instructors) than did the special ed sessions (with 8 total participants in the fall and 11 in the spring including the instructor) and therefore would be expected to have somewhat higher frequencies.

To compare the counseling and special ed posting frequencies on even terms, the researcher calculated two new figures for each session: Per-person posting frequency (in terms of posts per person per minute) and per-student posting frequency (in terms of posts per student per minute). The latter figure was developed to account for the fact that in all 22 MOO sessions studied, the instructors tended to post a far greater volume than did the students, thereby inflating the per-session and per-person posting frequency figures. By factoring out the instructor posts, the researcher was able to ascertain the per session and per-student posting frequencies for the students alone, better reflecting their behavior in the sessions and allowing for more meaningful comparisons between the counseling and special ed classes. Using these new figures, the mean per-person posting frequency of the counseling MOO sessions, 0.61 in the spring and 0.55 in the summer, are seen to be considerably higher than the 0.39 and 0.49 figures for the fall and spring (respectively) special ed MOO sessions. Likewise, the mean per-student posting frequencies for the counseling MOO sessions of 0.60 (spring) and 0.43 (summer) were substantially higher than the 0.25 (fall) and 0.35 (spring) per-student posting frequencies for the special ed MOO sessions. These figures merely confirm that the students in the counseling classes tended to contribute posts to their MOO sessions at a faster clip than did the students participating in the special ed MOO sessions.

MOO Communication Patterns

In all of the MOO sessions reviewed for this project, both counseling and special ed classes, the instructor used slides to convey information and facilitate discussion. The Encore Xpress MOO interface allows the instructor of a class to post slides that are visible to all class participants logged into the session. Each slide is saved as a web page and appears in the class recorder transcript as a link, which makes the slide available to anyone reviewing the class transcript as long as the source html files have not been deleted since the class session. Most slides from the spring counseling class sessions were still available for review during this project, thereby allowing the researcher to see what the students and instructors were seeing as they made their comments during the sessions. Unfortunately, many of the slides from the summer counseling class sessions had been deleted and were not available for viewing by the researcher. Fortunately, however, the comments and questions surrounding each slide in the class transcripts permitted the researcher to infer the slide contents in most cases.

While, as noted in Chapter III, the instructors in both programs used similar overall pedagogical strategies for their respective classes, such as using slides to disseminate information and facilitate discussion in the MOO sessions, it must be noted that the pedagogy was far from constant and identical across the two programs, four classes, 22 MOO sessions, and 28 Blackboard sessions reviewed. Indeed, the pedagogy employed by the instructors in the studied MOO sessions varied between programs, between terms, between sessions and even within sessions. For instance, in her first MOO session (in the fall term) the special ed instructor used the forum primarily as a

lecture hall and delivered the lecture through the use of a large number of web slides. As such, the instructor displayed as many as ten slides in a row and the students read them without making comments. Only after the slides were displayed did the instructor open the floor for questions. In her second MOO session, in the spring, the same instructor employed a bit more discussion, though posting even more slides than in the fall. In the spring, however, she paused more frequently between the slides to discuss them with the students as the session progressed.

In the 20 counseling MOO sessions that were analyzed, the predominant teaching style employed centered on discussion with the instructors offering prompts in the form of web slides or textual comments or questions designed to elicit comments from the students. The instructors then provided feedback to the students and asked follow-up questions to move the discussion along and keep it on track. Sometimes the prompts were designed to generate free discussion and active conversation among the students (rather than merely between the students and instructor) and sometimes the prompts were designed to elicit isolated responses from each student that all could then read and ponder. The instructors also at times used a lecture technique similar to that employed by the special ed instructor, having students read multiple slides or posts without responding. Rather than using one instructional mode throughout an entire session, the instructors would change pedagogy in the middle of a session, frequently more than once, especially if they perceived the need to slow the pace or to assist with transition between topics.

Each counseling MOO session would begin with a “warm up” period consisting of informal greetings and personal “chit chat” as students logged into the session and

talked about what had been going on in their lives over the course of the day or the prior intervening week. This period was also the time for any logistical, "class business" issues or technical questions/issues about the MOO itself (which were especially prevalent during the very first session in January of 2006). Then, at some point the instructors would indicate that it was time to get started and would begin the content portion of the session. Roughly midway through each session, the instructors provided a 5 to 10 minute break (though, as noted below, on numerous occasions several students and sometimes one or more of the instructors continued to stay online and discuss either class issues or other personal or professional issues during the break). After the break, the instructors would resume the content portion of the class and usually all or almost all of the students were back and ready to go (occasionally someone would come back late from break though neither the instructors or the students made an issue of this). Finally, at or near the end of the allotted time, the instructors would signal that the class was over. This announcement would bring on a rapid "wrap up" period consisting of comments about the class ("I really enjoyed today's session"), personal exchanges among the participants ("Good luck with your interview tomorrow, Jill") logistical questions ("Are we going to have a Blackboard posting this week?") and then goodbyes ("Bye all! See you next week!"). In almost every session, both spring and summer, this "wrap up" period coming after the announcement that class was finished would begin and end in no more than one to two pages of text, suggesting that each class came to an end within five to ten minutes of the announcement. As noted below, the same patterns were observed in the special ed MOO sessions.

Over the course of the 20 counseling MOO sessions reviewed for this study, some patterns began to emerge from the flow of discussion within the content portion of each session and which repeated themselves again and again as the sessions progressed. As noted above, a segment of the discussion would begin with a prompt, either by slide or by "verbal" utterance, usually given by the instructor (though students initiated discussion segments with prompts of their own from time to time during the sessions). Following the prompt, the students would begin responding in isolated, "stand-alone" comments: Comments made by the students in direct response to the prompt and without regard to the comments made by peers. In short order, the instructor would begin offering feedback to the students regarding their responses, acknowledging and affirming their posts: "Good thought!" or "That is a great idea." In some instances the instructors would ask follow-up questions directed toward specific student comments such as "Tell us more about that, Susan" or "How did you respond to that, Nathan". Next, the students would begin offering acknowledgments, affirmations, and/or agreements to the posts of their peers, but not offering any follow-up thought or adding to the idea: "I agree with Tonya" or "So true, April."

Soon after, the students would begin offering more substantive feedback to one another's posts which would lead to a time in the discussion when participants were building upon one another's contributions, finishing one another's sentences, and doing so without direct instructor facilitation (though the instructor was frequently contributing to the discussion at this point). This idea building would soon escalate into a very fast-paced, chaotic series of exchanges between two or three different groups of students with

multiple conversations overlapping. During this chaotic level of discussion, a participant's comment or question and its response might be separated in the transcript by many lines of commentary from unrelated discussions going on at the same time. Some of the students, especially in the early sessions, noted that they had trouble following along during this chaotic level of exchange and felt confused, lost, and frustrated at times. These sentiments were expressed less frequently as the class progressed into later sessions. The final stage of such a discussion segment would take place when the instructor would post a new prompt and attempt to re-direct the discussion toward a new topic. This would be followed by a period where the students wrapped up discussion on the existing topic before turning their attention to the instructor's new prompt. Sometimes this "overlap" period would take some time to resolve and would require multiple attempts by the instructor to "turn" the conversation by bringing the new prompt to the students' attention.

Not every instructor or student prompt resulted in a discussion that moved fully through this progression. In fact, many times the instructors would interrupt the progression by posting a new prompt, thereby restarting the progression. Likewise, not every discussion demonstrated every stage of the progression. Later in the first term, for instance, many discussions moved rapidly from isolated responses to idea building to chaos within just a few pages (which roughly equates to just a few minutes of elapsed time).

The sometimes frenetic pace of the MOO sessions was a source of frustration at times for the counseling students and a challenge for the instructors to harness and

control. Comments made during both focus group sessions and during the MOO classes and Blackboard discussions combined with the posting frequency data described above to paint a picture of a communication environment in which participants had to read fast, think fast, and type fast to keep up. Several students indicated at times throughout both terms, but especially during the summer term, that they were having trouble keeping up and contributing to the discussion. A relatively common phenomenon, according to the focus group comments, involved students discarding a comment they were typing rather than posting it because by the time they had finished typing the comment the discussion had already moved on to another topic and the comment was no longer relevant. In the early part of the summer term, so pervasive were students' expressions of concerns about their difficulties following along and keeping up with the MOO session discussions that the instructors addressed the issue in class and implemented pedagogical practices specifically designed to slow the pace. These changes appeared to be effective as expressions of concern and frustration about the pace of the discussion tapered off as the term progressed. Overall, the counseling instructors and students agreed that the MOO sessions were enjoyable and that everyone participated, despite the challenges.

The communication pattern in the first special ed MOO session was considerably different from that seen in the counseling classes. The class began much like the first MOO session of the counseling series, with greetings, personal conversations ("how are you?") and technical questions or reports of technical issues concerning the MOO ("How do I sign in and get 'guest' off my name??"). Once the instructor began the content portion of the class and started the lecture, the students fell silent until she prompted them

for questions, which was a substantial departure from the first counseling MOO session and from the overall discussion trend of the counseling MOO sessions. The instructor first prompted for questions and comments after the first 10 slides, and asked one specific question, "Is the speed too fast, too slow, ok?" to which three students responded that they needed more time between slides. Only one student asked a content question at this prompt which the instructor affirmed ("Ah, good question") and answered. During the display of the next set of nine slides, the students again were silent (save for one student comment and two requests for clarification, all three to which the instructor replied). After this set of slides, the first stage of the progression noted in the counseling sessions began to appear. The instructor prompted using a specific question to which the students initially faltered in responding, concerned about the need to be recognized first. After getting clarification that anyone could offer a reply without having to "raise their hand," the students offered isolated replies with no references to one another's posts, then the instructor provided feedback to them. After asking if all of the students were ready to move on (to which all replied affirmatively) the instructor then posted a few more slides that generated unprompted questions from the students. A final instructor prompt generated the most active participation of the content portion of the session, with students offering a few isolated replies then responding to one another's questions. The instructor then brought the content portion to a close and the "wrap up" portion that followed included the most chaotic dialogue of the session, with multiple, overlapping student-instructor exchanges concerning technical and logistical class issues and student dialogue about the MOO experience itself. The majority of the student-student and student-

instructor dialogue took place during the "warm up" and "wrap up" portions of the class, with relatively little outright discussion taking place during the content portion.

The second special ed MOO session (in April of 2007) had broader participation, fewer technical issues, and more discussion than the first, thereby more closely resembling the patterns of communication displayed in the counseling MOO sessions. The instructor utilized pedagogy in the spring nearly identical to that in the fall, displaying 24 slides (compared to 22 in the fall) and similarly displaying many of them as a lecture (back-to-back with no intervening instructor or student comments). Nevertheless, some discussion patterns were present in this session that were not seen in the fall term. The warm up period displayed the characteristics common to this portion of all the MOO classes examined for this study but contained fewer technical concerns and questions than the fall session. In fact, the instructor demonstrated more technical problems in this session (having trouble displaying slides and losing attempted posts) than did the students. Like the fall session, the instructor began with lecture, displaying four consecutive slides with relatively little commentary. After this lecture period, the discussion took a direction not seen in the fall when a student responded to the 4th slide with a comment that generated two pages of discussion involving eight of the students plus the instructor. Skipping the "isolated responses" stage of discussion, this period included elements of student feedback and idea building during which the students asked questions, made comments (many of which added to a comment made by a peer), responded to one another's (and the instructor's) comments and questions with affirmations/acknowledgments, and even offered technical assistance to the instructor.

After this exchange, the instructor displayed two more slides and discussion ensued again, beginning as isolated comments, then acknowledgments and student questions with instructor responses and student dialogues. Toward the middle of the session the class settled back into a lecture mode with the instructor displaying 11 consecutive slides with limited instructor commentary and some limited student commentary (including peer acknowledgments and affirmations). The 19th slide and subsequent instructor commentary generated another period of discussion in the class to which seven of the students contributed with comments and questions, including peers building on one another's questions. Similarly, the 20th and 21st slides generated questions and discussion between and among instructor and students. By the end of the content section of this class meeting, as the instructor was displaying the last few slides, almost all of the students (9 of the 10 in attendance) were engaged in the final conversation leading up to the end of the session. Quite clearly, this second session involved considerably more student participation and mutual engagement than did the session in the fall and this finding is supported by the per-student posting frequency numbers cited above that show a near 40% increase in student posting frequency from the fall to the spring. It must again be noted, however, that even the higher special ed student participation in the spring pales in comparison to that of the counseling students in both of their terms.

The Role of Instructors and Feedback in MOO

One strong consistency across all 22 MOO sessions reviewed for this study was the high involvement level of the instructors in controlling and guiding the flow of each

online MOO class session. This high level of involvement is indicated by the per-instructor posting frequency as compared with that of the students in each term. In the counseling sessions, for instance, each student posted at an average rate of 0.60 posts per minute in the spring and 0.43 posts per minute in the summer. Each instructor, by comparison, posted at an average rate (including guest presenters) of 1.21 posts per minute in the spring and 1.22 in the summer, between two and three times the mean rate of the students depending on the term. Similarly, the special ed instructor posted at a rate of 1.35 posts per minute in the fall session and 1.41 posts per minute in the spring, four to five times the mean rate of the students (0.25 posts per minute in the fall and 0.35 in the spring). This trend is also borne out by the post volume trends for the instructors as compared with the students. In the counseling class sessions, the instructor and graduate assistant posted a mean volume of 134 and 118 posts per session respectively in the spring and 149 and 106 posts per session respectively in the summer which are well above the mean per-student posting volumes of 62 posts per session in the spring and 45 posts per session in the summer. Even more pronounced were the differences in the special ed classes with the instructor contributing 111 posts in the fall session and 147 in the spring compared with the mean student contributions of 21 in the fall and 37 in the spring.

More than merely confirming that these instructors contributed a larger number of comments and at a higher frequency than the students in these MOO class sessions, these figures reflect what a review of the 22 transcripts clearly reveals: The instructors were actively involved from the beginning to the end of every session providing structure and

direction and facilitating the discussion and the process of learning. Using all caps to differentiate their posts from those of the students, the instructors in both programs gave logistical directions and provided the context for each class, both prior to (through reading assignments and prior class activities) and during each session (through slides and comments). They set the tone and structure for class interaction by encouraging student comments and questions through prompts and slides, though the counseling instructors did far more of this than did the special ed instructor. They then reinforced this tone and structure by using feedback, questions, and follow-up prompts to move the discussion along and build it. Finally, they actively reigned in the discussion when it began to wander off topic and changed its direction to keep each class progressing toward the coverage of all the intended topics and materials, though they did not always succeed in covering everything that was intended in every session.

The prevalence and substantial role of feedback in these sessions cannot be overemphasized. Throughout every session in both programs the instructors were seen responding to a very high percentage of student comments and questions. The feedback included simple affirmations and acknowledgments ("Good thought, Nathan"), follow-up questions or prompts ("Why do you think she responded that way, Susan" or "Tell us more about that experience, Jill"), and commentary to build upon an idea or comment offered by a student ("Exactly, Taylor, and thinking creatively about consent can come in handy in other situations as well"). The instructors in the counseling classes also utilized summary feedback to relay back to the students the general themes of what they had been "hearing" in the discussions. As the primary instructor of the counseling series said,

"Much of what we do is reinforce comments from students, tie together themes, and add in additional information related to the points we're trying to make. So, a lot of the learning does come from our interactions with students in class." While the students in both programs demonstrated an ability to "take control" of the discussion at various times by actively discussing a student's comment or question, the instructors would always regain control and direct the flow of the class discussion back toward the subject at hand, or the next subject on the agenda. This isn't to suggest, however, that the instructors were rigid. Indeed, both the counseling program instructors and the special ed instructor both spoke in their focus group/interview sessions about the value of being flexible in conducting classes in the MOO setting. In several of the counseling classes, for instance, a student would offer a comment that would take the class in an "off topic" direction but the instructor, rather than attempting to quash a conversation of obvious import to the students, would allow it to play itself out while eventually bringing the students back "on topic" through the use of comments, prompts and re-posting of slides. The same phenomenon was also demonstrated in the spring semester special ed MOO session.

The Blackboard Sessions

Turning to the use of Blackboard in these classes, as indicated previously, the two primary instructors used Blackboard in similar yet distinct ways during the course of their two terms with their respective students. Both instructors used Blackboard as a repository for class information including the syllabus, readings, and other course documents, though the counseling instructor posted a larger volume of materials (including photos of the class participants) on Blackboard than did his special ed

counterpart. The counseling instructor used the Blackboard asynchronous discussion forum to compliment and supplement the information exchange that happened during each scheduled MOO session. To that end, the counseling instructor posted a prompt to the Blackboard asynchronous discussion forum after every class meeting (f2f or MOO) with the expectation that the students would respond to the post and to one another prior to the next scheduled MOO meeting. The special ed instructor, by way of contrast, used the Blackboard discussion forum, like MOO, as an alternative to the f2f setting for regularly scheduled class meetings. In other words, this instructor would schedule a Blackboard class in lieu of a f2f class meeting on campus rather than in addition to that meeting. Instead of using Blackboard merely as a means of covering the same material without coming to class, the special ed instructor, like her counseling counterpart, purposefully used the Blackboard forum as the medium for addressing certain topics because the features of that medium allowed her to employ pedagogy she did not employ in the f2f meetings. Said the instructor, "I used Blackboard as a means of letting the students work on a project independently then collaborate on their results collectively online because most of the application work done face to face was done in pairs or groups rather than individually." Similarly, the counseling instructor suggested that the use of Blackboard in conjunction with MOO was to allow the students to more fully flesh out and reflect on the topics and issues addressed in the MOO meetings and added, "I think that Bb and MOO balance each other out very well. They offer 2 different ways of working with information and sharing ideas." Unlike in the MOO setting, however, where both instructors were active in the flow of the discussion, both of the instructors

elected to stay out of the Blackboard discussions (with the exception of the very first session for the special ed instructor), posting nothing but the prompt and allowing the students to post all of the comments. One other key distinction in the two instructors' pedagogy in Blackboard was that the special ed instructor posted a specific due date for each student's initial post and then a second due date per session by which each student was required to respond to the initial posts of at least two of their peers. The counseling instructors, by contrast, did not communicate a specific requirement concerning an expected number of responses to classmates' posts. The syllabus in both counseling classes did emphasize, however, the expectation that every student actively participate in the Blackboard discussion and respond not only to the instructor's prompts but also to the contributions of their peers.

As noted above, participation in the counseling Blackboard sessions was near universal and was very consistent across the two terms, meaning that usually every student would, at a minimum, contribute an initial post addressing the instructor's prompt. On occasion a student would forget to post or would be unavailable and miss a session or two (especially in the summer). In other ways, however, participation was not so consistent or even. For instance, students varied considerably in their posting length tendencies, with some routinely posting very long and thorough responses of a few paragraphs while others tended toward posts that were more terse, consisting of only a few lines. In either case, the trend in Blackboard was postings that were considerably longer than even the longest posts in the MOO. Also, the students varied with respect to when they would post to the forum with some tending to post early during each weekly

posting period (some would post shortly after the MOO class had ended, soon after the prompt went up) while others tended to wait until just before the next class. In most weeks during the spring term, the class was fairly evenly divided between students who posted before the mid-point of the week and those posting after the mid-point, with postings spread out across the entire intervening week. In the summer term, because the classes came more frequently (twice per week), the intervening Blackboard posting period was shorter so the posting dates and times were more concentrated, though posts were still spread out across the full range of the posting period for most sessions.

Another way in which student participation in Blackboard varied was with respect to how often students went beyond the initial posting expectation and posted replies to the comments of their peers. In one of the summer sessions, for instance, 12 of the 16 replies to original posts were contributed by only five students. In the next summer session, the same five students accounted for 10 of the 12 replies. In the spring term Blackboard sessions, the trend was toward isolated posts in which each student responded to the instructor's prompt. Only 28% of the initial contributions posted to the Blackboard forum that term received threaded replies, and even more rare were actual reciprocal exchanges in which two or more students would respond to one another's comments (complete posting data for the spring and summer Blackboard sessions are found in Tables 4 and 5, both contained in Appendix A). This is not to suggest that the Blackboard sessions were completely devoid of dialogue or any kind of idea exchange. Some threaded discussions did take place as in the fourth spring session when six students engaged in a multi-level exchange over the inclusion of counseling in an IEP

during which subsequent contributors built on the posts of those who came before. Also, students often included references or replies to previous posts in their own initial posts rather than contributing those comments or references in a threaded reply. Hence, even though the counseling students didn't frequently use the threaded reply feature of the Blackboard forum, they sometimes still acknowledged having read the posts of others in making their own subsequent contributions. In the summer term the volume of direct conversation increased somewhat with the first, fourth and fifth summer sessions having the highest volume of direct replies and reciprocal exchanges in the entire two-term sequence. However, the other five sessions reverted to the form of the spring term and contained very little direct exchange between students resulting in an overall reply rate only slightly higher than that of the spring, with 33% of initial posts receiving at least one threaded reply. All told, the Blackboard forum was not very conversational over the course of the two counseling class terms. Despite the expectation spelled out in the syllabus, in most sessions very few of the posts received replies.

Attendance in the special ed Blackboard sessions was not as universal as was the case in the counseling Blackboard sessions. Across the seven Blackboard sessions covering both terms, only two saw everyone participate (one student was excused by the instructor from participating in the 2nd and 4th sessions in the fall because she was already demonstrating the covered skills in her job). In every other session there were two students (not the same two each session) who did not post the initial assignment or comment on the posts of others, thereby not participating at all, and in one session in the spring there were three absentees. In addition, in every session after the first one (which

consisted entirely of isolated initial posts with no replies) at least one of the students who posted initially failed to post the required replies, in most instances failing to reply at all, and in a few instances replying to only one peer instead of the required two. On the other hand, some students in several sessions (but not all) went beyond the two-reply requirement and responded to more students. In addition to inconsistencies in attendance, the students varied considerably in the timeliness of their postings to the Blackboard sessions. While the majority of the initial posts were made by the instructor's deadline set for each session, late postings were relatively commonplace. In the third Blackboard session of the fall term, for instance, three of the nine students who participated made their initial post more than a month late. In a personal communication, the instructor revealed that these students, who had neglected to participate in this session when it was originally conducted, had asked and received permission to post the assignment at the end of the term to receive partial credit. In essence, then, these three students did not participate in this online class at all when it took place, since neither their posts nor their replies were available for the rest of the class at the time when the majority of participants were posting and reading. Rather, these three participated as a trio in their own late-stage Blackboard session. Though no other sessions demonstrated lateness this extreme, in almost every session one or more students missed either the initial posting deadline, the reply deadline or both. Waiting to post until the deadline or even after the deadline was commonplace in these sessions.

The fact that every student was required to post at least two replies to the initial contributions of their peers resulted in higher reply rates across the special ed sessions

than were seen in the counseling Blackboard sessions. Across the fall term, for instance, if one excludes the first session during which replies were not expected or encouraged, the response rate for the remaining three sessions was 64% (meaning 64% of the initial posts received at least one threaded reply). The response rate across the three spring sessions was even higher, with 86% of the initial posts receiving at least one reply. Complete Blackboard posting data for both Special Ed terms are shown in Tables 6 and 7, both contained in Appendix A. These relatively high response rates, however, did not equate to an even distribution of responses. In every session at least one initial post received no replies at all while some initial posts received as many as five replies in a session. This uneven distribution was not due to posting times as in many instances all of the initial posts had been contributed before the responses began to come in a few days later, and even late initial posts were candidates to receive some replies because the bulk of the replies usually came in toward the end of the mandated posting period (or after it) anyway. With respect to the replies, they included affirmations and acknowledgements ("Great job!" or "I really enjoyed reading your summary"), expressions of agreement ("I feel the same way"), expressions of opinion about the issue being discussed, questions (some rhetorical and some directed back to the original student), and answers to questions posed by the original contributor. Yet most were directed back to the original post to which they were threaded rather than commenting on material in other replies. Therefore, while one initial post may have generated five replies, all five were usually isolated responses to the original post rather than building upon or even acknowledging one another, and most had no responses from the student to whom the replies were

directed. Again, as with the counseling Blackboard sessions, this does not mean that the special ed Blackboard classes were completely devoid of student dialogue. Across the seven sessions there were a few examples of reciprocal exchanges in which a student posted a response to a reply. For instance, in the second Blackboard session of the fall term, a student posed some questions to the author of the initial post to whom she was replying, and the originating student answered those questions in a threaded reply. A few other examples of similar exchanges were found across the seven sessions, but these were clearly the exception and not the rule. As with the counseling series, the Blackboard sessions in the special ed classes were not conversational. As one of the counseling instructors put it, "On Blackboard, statements seem to stand alone, more... In MOO, it's more of a collaboration... statements build off each other." The special ed instructor concurred, saying, "There's no direct interaction in BB."

Manifestation of Constructs

Having described the general structure, functions, and communication tendencies observed in the online sessions of the subject classes, the focus now shifts to how the four constructs of Presence, Social Interaction, Social Presence and Sense of Community were manifested in those class proceedings. Indicators of all four constructs were observed in both the MOO and Blackboard sessions, though not all of the indicators were equally prevalent in both online forums or in all four class settings. Several counter-indicators were also noted for some of the constructs, helping to shape the overall picture of how the constructs manifested themselves within these online learning settings. What follows is an examination of the findings with respect to each of the four constructs in turn.

Presence

In examining the online class materials for indications of presence, the researcher first and foremost sought language within the MOO and Blackboard sessions that was consistent with or which contradicted the conceptual definition of the construct. As such, presence was indicated to the extent that participants used language describing their experience of an online session as one of "being in a place" (a non-mediated experience) as opposed to language explicitly acknowledging their use of technology (a mediated experience). Over the course of the 22 MOO sessions reviewed for this study, this language was almost evenly mixed between examples consistent with presence and those that were not. For instance, participants frequently referred to successful entrance into the MOO sessions with language like "I am here" or "We're glad you are here," and described a return to the MOO after an absence with language such as "I'm back" or "Are we coming back?" On the contrary, however, participants also frequently referred to their comings and goings in the MOO as "logging on" or "being on" and being "kicked off" which are all clearly technological rather than spatial terms. One example that includes both took place in one of the counseling sessions where a student encountering a summer storm said that the storm might cause her to get "kicked off" and that she may therefore be "coming and going" in and out of the session. Aside from the ubiquitous arrival, departure, connection and disconnection messages that the MOO is programmed to display according to the comings and goings of participants, language of any kind

relating to participants' status in the MOO was relatively rare when compared with the voluminous content language in these sessions.

Moving beyond the conceptual definition to the operational, in analyzing the data for manifestations of presence, the researcher was interested in two broad themes: The degree to which the virtual experience, rather than the technology used to generate it, was salient and the degree to which the participants' attention was focused on the virtual world rather than the real world during class sessions. With respect to both MOO and Blackboard, both indications and counter-indications of presence along both themes were noted in both the online session transcripts themselves and in the focus group/interview sessions. With respect to the first theme of whether the virtual experience or the technology was more salient, the most obvious potential indication of the salience of the technology was in the form of technical problems that hindered or even prevented the instructor and/or students from participating in the online sessions. Across the 20 counseling MOO sessions observed for this study, however, technical problems were neither pervasive nor frequent and, for those that encountered them, were relatively minor and usually overcome. As for the two special ed MOO sessions, technical problems abounded in the fall session but were not nearly as prevalent in the spring.

The technical problems encountered in the MOO sessions fell into two general categories: Problems logging on or staying logged on and problems posting comments or slides. With respect to the former, in every MOO session across all four classes at least one student reported issues with logging on or staying logged on. There was only one counseling MOO session (the very first in the spring term) in which a student missed the

session reportedly because of being unable to log on. This happened to at least three students during the fall special ed MOO session (two more were unaccounted for but there was not a clear indication that it was due to the inability to log on) and may have also been the cause for the absence of two of the students in the spring special ed MOO session. In several sessions in both programs a student logged into the session using a guest account reportedly because their personal MOO account was not working. As a result, their identity in the session included the word "guest" such as "Susan_Blake_[Guest]" but otherwise they were able to participate in the session in the exact same manner as if they were logged in with their own user account. This never happened to more than one student during any session. In two instances, students were able to overcome their login problems by using alternative hardware (using the computer at a friend's house) or by updating the software on their computer to allow a successful log in (updating their Java client).

Issues staying logged on were more prevalent than were problems getting initially logged on. In almost every session at least one student (and frequently more than one student, but rarely more than two) would lose their connection to the MOO and would have to log back in. In almost every instance the booted out student would log back into the session without having missed a great deal of content and would resume participation. In some sessions this happened to one or more students numerous times. While an occasional brief lost connection did not appear to substantially disrupt a student's online class experience, a prolonged lost connection or multiple lost connections did appear to

be quite disruptive and often elicited expressions of frustration from the affected student(s). These were not the norm, though.

The second most common kind of technical problem encountered during the MOO sessions was difficulty posting comments or slides. In most instances, the problem was attributable to user error such as when users would type a comment but forget to click the "say" button in Xpress, and upon pressing enter to send the comment, would receive an error message and then have to retype the comment. Sometimes the root cause was not identified but the user would report that something they typed did not appear on the screen. Since a failed post does not appear on the transcript, this problem was indicated by user comments about lost posts during the session, and by comments made in the focus groups and in Blackboard posts. This issue surfaced far less frequently after the initial MOO sessions during the two counseling terms, but was seen in both of the special ed sessions. Similarly, the instructors would sometimes run into trouble displaying a slide in MOO, usually because they would "say" the command rather than entering it into the MOO as a command. This was always evident in the transcripts when one of the instructors would be quoted as saying "Display X" where X was a slide number. In every instance, the instructor would quickly recognize the error, change modes, type and enter the command again, and display the slide. In the summer term, the counseling instructors encountered a problem where for several sessions, despite typing the command properly, they were unable to display the 18th slide, but this was a very uncommon problem.

Another common posting problem cited in the counseling MOO sessions, but not evident in either of the special ed sessions, was a lag or delay between when a participant would press enter and when their action would display on the screen. This phenomenon, though relatively uncommon, seemed to linger throughout an entire session (but not between sessions) for those affected and had a detrimental impact on their participation in the discussion during the session in which it appeared. Nevertheless, the affected participants continued to take part in the session and simply noted from time to time why their comments were a bit delayed. The relative absence of complaints about this issue in the class transcripts suggests that for most participants during most of the sessions there was no perceptible or at least no substantial delay between their taking an action and the result appearing on the screen. This correspondence between actions and resulting on-screen results is another indicator of presence.

This phenomenon of delayed postings and the other posting issues noted above point to two other indicators of presence related to the salience of technology: The degree to which the virtual environment responds to the actions of the user and the resulting degree to which users can anticipate what will happen in response to the actions they perform. The single largest indicator that the MOO system was responding appropriately to the participants and that its responses met their expectations was the relative scarcity of comments to the contrary during the sessions themselves or during the Blackboard sessions or focus group/interview sessions. Most of the comments and questions that did indicate a disconnect between a student's intended action and the results on the screen were problems posting or problems using the "emote" feature in the

early sessions of the first counseling term and in the fall special ed session when students were becoming acquainted with the interface. The absence of reports of problems or unexpected results during the counseling class sessions clearly suggests that the MOO was usually working as participants expected and that users felt they could control it. The counseling participants' focus group sessions further reinforced this perception. The same was evident in the second special ed MOO session, which showed very few signs of participants questioning how to accomplish things in the MOO. The first session was quite the reverse, however, in which several users appeared unsure of the interface and lacking in confidence. According to the special ed instructor, several students who had difficulties expressed their frustrations with MOO during the next f2f meeting of the class. Clearly, this session, and to a lesser extent, the first counseling MOO session, illustrate how technical problems can profoundly impact on participants' sense of presence and on the overall learning experience. In these two instances, for many participants the technology was so salient that it overwhelmed all other aspects of the experience. Throughout the remainder of the sessions, however, the technology appeared to take a back seat to the conveyance of information and communication in the class sessions, suggesting presence was relatively strong.

Turning to the second presence theme, the degree to which the virtual world rather than the real world is salient to class participants during class sessions, there were two main indicators within the sessions themselves: Evidence of real-world distractions impinging upon a student's class experience and evidence that students were aware of the passage of time during the class session. Throughout the 22 sessions examined for this

study there was fewer than one incident per session where a participant made reference to a real world event taking place around them during a MOO session. Examples included a student who disclosed that he was being asked to log off his computer and leave his work setting in the middle of the session and several students who mentioned storms happening at the site from which they were logged in which potentially threatened their ability to stay logged into the session. Likewise, there were a few comments over the course of the 22 MOO sessions that clearly indicated a student's awareness of either the passage of real time (most often through suggesting that it was time for a break) or their awareness of actual chronological time at that moment ("my clock says it's 5:30"). Such references were no more frequent than were the real-world distractions.

More indicative of presence than the MOO session transcripts themselves were the interview and focus group responses during which the students and the instructors from both programs intoned that during the MOO sessions their attention was almost exclusively focused on what was happening on the screen. This was a necessity, they concurred, in order to be able to keep up with the volumes of discussion contributions that continually scrolled across the screen. As one student put it, "Shoot, I was afraid to focus on anything else because so much good stuff was coming so fast." The instructors concurred, saying that the MOO session on the screen dominated their attention more so than the room around them or the technology used to interface with the system. Said the primary counseling instructor, "For me, MOO becomes the real world for the 2 hours that class lasts" and another said, "After the first meeting the technology fades." Similarly, the special ed instructor said that during class she was "Only focused on the moo 'cuz I

had to keep up with what the student's were saying and on which slide I needed to post." Likewise, both counseling instructors and the students concurred that they tended to lose track of time during the MOO sessions, and that the sessions "flew by" and were over before it felt like they should have been. The special ed instructor countered somewhat saying that her MOO classes tended to "take about as long as expected. I tend to present too many slides [for the allotted time]." She was referring to the fall class when time expired and she was not even halfway through the presentation, suggesting that the time in MOO passed at least faster than her pedagogy had planned for.

All told, the indicators from the MOO sessions and from the focus group and interview data strongly suggest that the virtual environment was highly salient during the MOO sessions, though perhaps a bit more in the counseling sessions than in the special ed sessions. This finding combined with the technology salience findings noted above suggests that participants did experience presence in the MOO sessions and that the presence construct was strong for at least some of the participants, if not equally strong for all. This finding is consistent with the model of online learning experiences proposed by the literature. In the final assessment, one instructor summed up his own presence experience with MOO in saying, "I really think of logging into MOO the same as walking through the classroom door. And, at the end of class, when we do all the 'goodbye, see you next week' exchanges, it feels like everyone's heading out the 'door.'"

As indicated in the presumptions and biases section, above, this researcher expected that an asynchronous discussion forum like that used in Blackboard would demonstrate fewer indications of presence than would a synchronous virtual

environment. Interestingly, the Blackboard forum demonstrated fewer of the presence counter-indicators noted above than did the MOO sessions. For instance, technological problems were next to nonexistent in Blackboard with the only notable exception being instances where students in the special ed classes tried unsuccessfully to upload attachments and had to try multiple times to succeed. Other than this attachment uploading issue, there were no indications that the Blackboard system failed to respond to commands, demonstrated any appreciable delays in responding to those commands, or failed to meet participants' expectations. The lack of such comments suggests that the Blackboard system, perhaps more so than the MOO, was responsive to student inputs, performed according to their expectations, and allowed them to accurately anticipate outcomes based on their inputs. Additionally, there were fewer references to real time in Blackboard than in MOO. One of the few examples involved a post in which one of the counseling students noted how late a peer has been posting to the forum based on the time stamp on that peer's messages. Finally, there were no references to real-world distractions taking place while a student was posting. The combination of these language indicators and the absence of counterindicators alone could be construed to suggest that the participants experienced a stronger sense of presence in the Blackboard sessions than they did in MOO. However, such a conclusion based on only one data source would be premature. Analysis of the Blackboard transcripts for language consistent with the conceptual definition of the construct and information from the focus group and interview sessions painted a considerably different picture. First, the transcripts from all of the Blackboard sessions from all four subject classes were completely devoid of any

language suggesting that participants viewed the use of Blackboard as "being in a place," a non-mediated experience. In fact, the transcripts lacked any language whatever addressing how the participants viewed their status while logged into the Blackboard system. More telling, however, were the focus group and interview comments from participants that drew a clear distinction between the presence levels experienced in Blackboard and those of MOO. As one of the graduate assistants in the counseling instructor focus group put it, "Moo [is] like going to class except with the option to be physically virtually anywhere; Blackboard is like checking email - it is a task that you do not a process." The special ed instructor concurred, saying, "[Blackboard] is more like checking email." One of the counseling students suggested a similar sentiment in saying, "I agree with the combination, but it could be a pain sometimes to get the [Blackboard] part done."

Overall, despite the prevalence of the operational indicators of presence (and the relative absence of operational counterindicators) in Blackboard, the consistent and definitive focus group comments and the absence of any language within the Blackboard sessions consistent with the conceptual definition lead this researcher to conclude that the MOO sessions exhibited a much stronger sense of presence among participants than did the Blackboard sessions in all four subject classes. Though presence may have been indicated to a somewhat lesser extent in the special ed MOO sessions than in the counseling MOO sessions, the combination of data from all sources suggests that the MOO sessions promoted at least a moderate sense of presence among class participants.

Social Interaction

As noted in Chapter III, the indications of social interaction which guided the researcher's analysis of the class transcripts and the protocol for the interviews and focus group sessions was based on the themes of relational communication schema developed by Burgoon and Hale (1987) which characterizes social interchanges as those that convey immediacy and affection, similarity and depth, composure or tension, dominance or equality, formality or informality, or finally, receptivity and trust. The first of these themes, immediacy and affection, refers to language of inclusion, involvement, and warmth toward others such as greetings, personal inquiries, and expressions of emotion, and to say that this kind of language was abundant in the MOO sessions would be a gross understatement. From the very first session in both programs, students were offering greetings and personal inquiries. In fact, this was the pattern at the beginning of every MOO session with lots of Hi's and Hello's and even virtual waving as people logged into each session. Even in the middle of sessions as users logged in late, they were almost always greeted by both the instructor and at least one student. The beginning of every session was also marked by personal inquiries, many as standard as "How are things?" but many also far more specific, asking about how a job interview had gone or about the status of a personal situation revealed in an earlier MOO session or Blackboard posting. Likewise at the end of every session, before the final goodbyes and "see you next week" expressions, the class participants would again frequently engage in personal inquiries about the coming days' or weeks' events. Personal inquiries and discussions were not

confined to the warm-up and wrap-up periods of sessions, however, and often showed up during the breaks and during the content portion of the sessions as students disclosed situations at work or in their personal lives, and other participants queried them for more information.

Warmth toward others and expressions of emotion were also abundant in all of the MOO sessions examined for this study. In the absence of being able to use facial expression and tone of voice, students expressed emotion through overt statements such as "I feel frustrated right now" and "That makes me sad" and the use of "emoticons" such as ":)" and ":(" and variations thereof, which were ubiquitous throughout these sessions. They also used abbreviations to express laughter such as "LOL" for "laughing out loud" and expressions such as "GRRR!!!" to convey anger (though usually in jest). There was also plentiful use of the MOO's emote function. When in "emote" mode, anything a user typed and entered into the forum would appear on the screen as an action rather than as a "saying." Hence, using emote, students were able to post things like "Jill giggles at Susan" and "Megan hugs Tonya." It must be noted that use of emote varied considerably between students, and some readily admitted both during the sessions and during the focus group session that they were never fully comfortable using the emote feature. Still, most everyone used it to some degree, some (especially the instructors) doing so frequently. The use of emote was seen as especially important by the counseling instructors who, during their focus group session, said that the class became more "real" as students began to use emote. Said one instructor, "It's funny, you can sense them being very proud of themselves when they figure it out and start using it effectively."

Finally, students more subtly communicated sentiment through the use of repeated punctuation, for example “What?????” to convey surprise and “I can’t believe that!!!!!” to convey exasperation.

It must be noted that while abundant in every MOO session, language of immediacy and affection varied somewhat between and within sessions, depending on the topics being discussed. Some segments of discussion were replete with laughter, jokes, smiles, and high fives while other segments were far more “serious” and contained far fewer pleasantries. Likewise, some sessions, overall, from beginning to end contained more expressions of emotion than others. This was made evident, for example, by the two special ed MOO sessions wherein the second showed considerably more warmth and affection language than did the first. In similar fashion, the final counseling MOO session of the summer term had considerably fewer expressions of humor and joviality than most other sessions of that term, in part because the participants were working through some conflict issues in that session which had arisen during their prior meeting. All told, however, the norm was a plentitude of virtual hugs, smiles, greetings and laughter, through which the MOO sessions most definitely conveyed warmth, inclusion, and positive sentiment. As one of the counseling students said in their focus group, “We were animated and friendly from the start.”

The second social interaction language category, similarity and depth, refers to language that serves to deepen relationships, most notably, self-disclosures, which were highly abundant in the counseling MOO sessions and evident to a lesser extent in the special ed sessions. So abundant were the disclosures observed during the counseling

MOO sessions that it proved useful to break them down into three broad categories: Professional disclosures, personal disclosures and disclosures of sentiment. The first of these, professional disclosures, were statements revealing something about the speaker's work setting, work practices, or work experiences, and they were common throughout these sessions. From the outset of the counseling series, as has been noted in the literature on adult learners, the students and instructors demonstrated a willingness to share things that they had observed, done, and experienced in their working lives. Many of these disclosures were somewhat sensitive in nature, such as disclosures about problems that a student had encountered in dealing with an administrator or a coworker in their school or school system, though all participants took care not to violate the privacy of their coworkers or students. One example, in the second term, for instance was when a student said "I'm ashamed to say a teacher at one school made a horribly racist remark to me about the students and I did nothing about it." The second special ed session also exhibited "professional disclosures" though these involved experiences students were having in their practicum placements since most of the special ed students were not yet practitioners in their field. The first special ed MOO session, by way of contrast, contained no professional disclosures.

Personal disclosures, on the other hand, were statements revealing something about the personal life of the speaker and were also quite plentiful in the counseling sessions though less so at the beginning of the first term than they were later on, and they became more common as the class series progressed. Likewise the degree to which these disclosures were personal increased as the two classes progressed, beginning with

relatively non-sensitive things such as the number of children a student had or where someone was born and grew up. However, by the end of the first term some of the disclosures had become quite personal, as when a student revealed a personal crisis with which she was dealing, or in the second term when a student revealed that she was caring for her terminally ill grandmother. In one example in the summer term, a student talked about her struggles dealing with two cultures while growing up. "I tried to live in both worlds," she said, and added, "I think now that I was depressed as a teen." Another example is when a student said, "That is my weak part, I have no tough skin. I am a crier." By the end of the second term substantial personal disclosures were almost as common as professional ones. This increase in personal disclosing may have been prompted, at least in part, by the nature of the assignments in the summer term which emphasized personal reflection and disclosure about students' racial identity. By way of contrast, the two special ed MOO sessions combined contained only one example of personal disclosure, and that was made by the instructor in the spring term (revealing her preschooler's taste in music).

The final kind of disclosure which this researcher terms disclosures of sentiment, were simply statements through which a participant revealed and described a state of feeling that he or she was experiencing or had experienced. One example came from a student in the summer counseling term who said during a discussion, "Some of this seems a little intimidating to me," and another is found in a later session where a student said, "I am feeling a little overwhelmed." While sentiment disclosure was common across all of the counseling MOO sessions, it was not as prevalent in either term as

professional or personal disclosure and was more common in the second term than in the first. Again this may have been partly because of the nature of many of the second term projects which required students to reflect on their own biases and feelings about race and other multicultural issues. The special ed sessions, on the other hand, were completely devoid of sentiment disclosures.

All told, disclosures of all three kinds were a relatively common occurrence in the 20 counseling MOO sessions, though the frequency with which the three types were in evidence varied across and within terms and sessions. By way of contrast, disclosures were relatively rare in the two special ed MOO sessions, especially the fall session in which no disclosure of any kind took place. The spring session contained several professional disclosures, one personal disclosure and no disclosures of sentiment. This finding is interesting when one notes the fact that, according to the special ed instructor, the f2f class sessions over both terms included fairly routine examples of all three disclosure types. Based on this information, it is clear that the finding here is not that the special ed class participants were unwilling or uncomfortable expressing similarity and depth to one another through disclosures. Rather, the finding is simply that they did not offer disclosures during the online component of their course conducted in MOO.

Language conveying composure or tension, language conveying dominance versus equality, and language conveying receptivity were somewhat related in the counseling sessions. As indicated in the discussion on immediacy and affection, the prevailing tone of the counseling MOO sessions was one of warmth and friendliness in which people agreed with one another, acknowledged and encouraged one another's

contributions, and affirmed one another's comments. As made evident by the transcripts and indicated by the focus group responses, the instructors set a tone early using equalizing, informal language that encouraged democratic student participation that blurred the distinction between students and teacher. The students took those cues to heart and demonstrated a willingness to comment, ask questions, answer one another's questions (rather than deferring to the instructor), comment on one another's posts, and even prompt the class toward their own discussion topics from time to time. As a result, while students and instructors sometimes communicated strong feelings about issues, their language usually communicated composure, a calm demeanor, and an interest in hearing the ideas of others. The latter was conveyed largely through feedback students and the instructors would give one another which, if nothing more, conveyed to the contributor that he or she had been heard. That is not to suggest that the sessions were completely devoid of dominance and tension. Dominance, according to Burgoon and Hale, is indicated when one participant attempts to persuade another or to change another's position on a topic, and there were numerous incidents throughout the two terms when students in the counseling sessions would disagree with one another and/or with the instructors. At times, some of these exchanges did demonstrate tension and strong sentiment about the topic at hand. However, participants only rarely attempted to convince the other to change positions, and never did the exchanges become confrontational. As the students in the focus group commented, disagreements were handled in an atmosphere of mutual respect among equals, even between student and teacher. In like manner, the special ed class participants were also inclined toward

equality, composure and receptivity, answering one another's questions, freely asking questions of the instructor, and acknowledging and expressing agreement with one another's comments. There were no indications in either special ed MOO session of disagreement or tension.

Just as the instructors set the tone early for a discussion among equals, they also purposefully modeled and established a context for the abundant use of informal language from the outset. As the primary counseling instructor indicated during a focus group session, "In the first MOO class of the semester, we keep it especially informal, and I make a point of starting to tease students and joke about myself to lighten the mood and bring down the anxieties that are there." That lightened mood carried over throughout the sessions with plentiful and frequent use of informal cues and sayings including humor, quips and slang from both the instructor and students. As noted above, humor was especially abundant with students and instructors making jokes, using sarcasm, teasing one another, and even using the emote function to make humorous virtual gestures like "winking," "rolling their eyes" at one another, and "sticking out their tongue." In response, the students "smiled" at one another and laughed at one another using emote and using laughter expressions such as LOL. Another informality cue was the abundant use of first names from the very outset of the first session. In comments, questions, acknowledgments, agreements, affirmations, and even disagreements, students and the instructors used first names in addressing remarks toward one another. One of the counseling students, in their focus group, contrasted the language in MOO with that used in Blackboard saying, "UMOO was less formal [than Blackboard], and we used slang

more, didn't type in complete sentences. . . things we wouldn't have done in [Blackboard]."

Informal language was also evidenced in the special ed MOO sessions, especially the spring session which included far more abundant use of humor. This difference between the two special ed sessions highlights the important observation that the use of informal language, just as with expressions of warmth and sentiment, varied between and within sessions, depending on the topic being discussed and the tone set for that discussion. Some sessions demonstrated more formal language, overall, than others, and some periods of discussion within a session were more formal than others, though informality was pervasive throughout. As one instructor put it during a focus group session, the tone was "casual, but serious when it needs to be. I think there is a lot of teasing and humor, but also a great deal of respect for the instructors and for other students." Another added that the language used in MOO was, "Relatively informal, especially once the course got underway... Respectful, but informal... conversational, the way it would be in a 'normal' class."

The final indicator of social interaction, which Burgoon and Hale tie into the receptivity function noted above, but which bears special focus here is that of trust. In the focus group sessions conducted with the sample of counseling students, and with counseling instructors, the development and communication of trust was a frequent theme. Both the instructors and students continually echoed the idea that as the class progressed, trust developed among the students and between the students and instructors. While the sessions contained a modicum of overt language that indicated trust such as

one student saying to the new GA at the start of the summer term, “You were introduced by our professor and my trust in him transferred to you,” the primary language indicator that conveyed trust was the disclosure behavior described above. Some of the very personal disclosures and many of the professional disclosures included candid assessments of coworkers and superiors or other elements that could have been potentially damaging to the speaker should it have found its way back to their workplace or otherwise have been shared outside of class. For participants to share those disclosures within the class in and of itself communicated a substantial level of trust to the class participants which they recognized. Said one instructor during the focus group session, “Yes... they shared a lot... they wouldn't have done that if they didn't feel safe...” One of the students concurred saying, “It was a safe haven for us and I'm so glad it was with all I went through in the program.” The special ed MOO sessions, in contrast, did not include overt language of trust and, as noted above, contained far fewer disclosures than did even the early counseling sessions, much less the later ones. Note, this does not necessarily imply that the special ed classes developed a lower level of trust than did their counseling counterparts, it is merely a statement of the observation that the MOO sessions from those classes contained far fewer examples of language performing the social interaction function of communicating trust.

Turning to the analysis of the Blackboard discussions from the four classes, an interesting pattern of findings emerged that contradicted the initial biases and expectations of the researcher as noted at the beginning of this chapter. Contrary to the expectations of the researcher, the language employed in the Blackboard sessions across

all four classes strongly exhibited much of the same social interaction language as was observed in the MOO sessions. For example, expressions of sentiment and emotion were quite common in the counseling Blackboard posts, including the use of emoticons (the smiley face was just as ubiquitous in Blackboard as in MOO), simulated nonverbal expressions like "Grrrr!" and outright statements like "I am a little frustrated right now." The Blackboard sessions in the special ed program contained similar expressions of emotion, but at a substantially lower volume than seen in the counseling classes. Likewise, all three kinds of disclosure (professional, personal, and sentiment) were evident in both programs, sometimes incorporated into a direct response to a prompt which called for at least a modicum of disclosure such as "describe your goals for this course" and sometimes unsolicited. As with the MOO sessions, the amount of disclosure, especially personal disclosure, seemed to grow over the course of the two terms in the counseling series, with students offering some very personal factual and sentiment disclosures by the sixth session in the spring. This trend continued and expanded in the summer term where all three kinds of disclosures became even more frequent and more personal for many of the counseling participants. The Blackboard sessions in the special ed series operated in much the reverse, with the majority of the personal and professional disclosure coming at the outset of the first Blackboard session of the first term, and then diminishing after that, though it must be noted that the initial flurry of disclosure was in response to a prompt and example from the instructor that encouraged such disclosure. Despite the lower volume, however, disclosures both personal and professional were

evident in almost every one of the seven Blackboard sessions in the two special ed courses, whereas sentiment disclosures were less frequent.

Just as in the MOO sessions, these relatively frequent disclosures performed not only the similarity/depth function of social interaction but also to communicate receptivity and trust among course participants. In addition, the statements of affirmation and agreement which were plentiful in many of the original posts and replies in both programs' Blackboard sessions served to communicate receptivity from one student to another in much the same way as in the MOO sessions. Even in disagreement, which was relatively rare in Blackboard (just as in MOO) the students demonstrated a respectful tone and mutual appreciation for the position of the other (equality) rather than attempts to undermine the position and/or convince the other (dominance). Even in potentially contentious issues (a few of which arose during the counseling sessions and none of which arose during the special ed sessions) students' communications reflected composure more so than tension, and contained no examples of "flaming" or lashing out at one another, just as in MOO. In many ways, then, the Blackboard discussions demonstrated relational language comparable to that of the MOO, a concept with which the primary counseling instructor concurred when he said, "I found that students in MOO courses carry over their style of interacting with others to postings and discussion on Bb."

It would be both incomplete and inaccurate to suggest that the social interaction demonstrated in Blackboard was entirely equivalent to that in the MOO, however. Two notable and substantive differences were manifest throughout the sessions, the first of which was the relative formality of the language in Blackboard as compared with MOO.

The postings in Blackboard far more often than in MOO contained complete sentences, proper spelling, and proper sentence structure while far less often than in MOO contained slang, colloquialisms, and banter. A related and even more pronounced finding was the substantial lack of humor in Blackboard as compared with the MOO sessions. In Blackboard across both programs and all terms there were far fewer examples of jokes, teasing, sarcasm, and "cute" interjections than in MOO. Resultantly, there were almost no indications of responses to humor such as expressions of laughter like "LOL," virtual smiles, and the virtual "rolling of eyes." So striking was the absence of informal language and the use of humor in Blackboard that the researcher was led to conclude that social interaction was somewhat less strongly represented in the Blackboard sessions than in the MOO in all four subject classes, even though many of the other elements of relational communication were almost equally demonstrated between the two online media.

Social Presence

In analyzing the MOO session transcripts for indications of social presence, the researcher first and foremost noted language that clearly indicated a perception on the part of participants of the presence of others consistent with the conceptual definition of the construct, and examples of such language were evident in all of the sessions reviewed. As noted in the discussion on greetings, above, students already logged into a MOO session would almost always make note of the "arrival" of students subsequently logging into the session and offer them greetings. This was made possible because the MOO system is programmed to post a textual announcement to the discussion display,

like “Jill_James arrives from the Courtyard,” indicating when a user has entered the MOO room in which the class session is taking place. Likewise, when a student would leave the room or (more commonly) lose their connection, the MOO system would announce that fact to everyone still logged into the class, as in “Nathan_Hardy has disconnected.” Such unexpected departures were frequently (though not always) noted by those still in the session, such as a comment like “Megan is having problems staying logged on today.” The MOO also offers two graphical interfaces that students can use to visually confirm who is in the virtual classroom with them, though there were no indications (and some counter-indications, as noted below) that anyone other than the GA in the summer counseling class used those means of “looking around the room” to see who was there.

Other than participant reactions to arrivals and departures, the most pervasive and obvious indication that participants were aware of the presence of others throughout all of the MOO sessions analyzed was the actual dialogue of the sessions themselves, in which participants were constantly affirming their perception of others through responding to the things others would say in the class sessions. Sometimes students would utilize this method of social presence indication to confirm their own social presence in the session, as when a student asked, “Can anyone see this?” out of a concern that her posts weren’t showing up. In a similar instance, a student asked, “Can you see me?” when concerned that she had not successfully logged into the session. In both instances several peers answered, “Yes, we can.” Another indication of social presence was the tendency on the part of the participants to use language more consistent with being together in a

physical classroom than language suggesting they were merely logged onto a shared software application, such as saying “I have to leave early tonight for a meeting” as opposed to “I will have to log out early tonight” or asking “Is Melissa here?” instead of “Is Melissa logged on?” This tendency was clearly demonstrated by one of the student focus group participants who said at the end of the session, conducted in MOO, “Goodnight to all of my friends. It was great to be with you again.”

Perhaps the strongest indicator of the role of participant contributions in social presence during the MOO sessions was the impact of silence on social presence. As noted during the discussion on communication patterns within the MOO, some students tended to say more in the sessions than did others as clearly indicated by the post counts. This phenomenon manifested itself in the MOO sessions as relatively lengthy periods of silence from some students as others tended to “talk” more consistently throughout the sessions. What became apparent from the MOO transcripts of some sessions was that prolonged silence on the part of a participant was sometimes interpreted as absence from the session. There were two instances in the counseling classes, for instance, where a student was silent for a long period of time and a peer presumed he was not present and asked where he was. In both instances, the silent student quickly spoke up and announced his presence to the inquiring student and to the class. In both instances it was clear that social presence was channeled through participant contributions and a lack of such contributions was tantamount to social absence. This phenomenon was perhaps best described during the counseling instructor focus group when the primary instructor said, “The thing with MOO is that if you're not talking (or at least emoting) and responding,

you essentially are not present in class. That's never true in F2F," and his GA added, "You HAVE to be engaged in order to keep up and not disappear..."

In addition to these indications consistent with the conceptual definition of the construct, the researcher also noted examples of language within the sessions consistent with Tu's (2002) model of social presence. The first portion of the model, social context, refers to the degree to which users perceive a medium as promoting social communication and is indicated through many of the behaviors already noted above as having been observed in the MOO sessions. For example, a strong social context is indicated by social or relational language that shows students to perceive the class setting as a social, personal, and sensitive communication forum, such as the abundant disclosures, greetings, affirmations, and expressions of emotion noted in the preceding section on Social Interaction. Similarly, social context includes indications that participants perceive the class setting as a casual forum, such as the abundant informal language from participants in the MOO sessions like the colloquialisms, slang, and humor noted above. Finally, a strong social context is indicated through language showing a comfort in communicating with others and a familiarity with others, like use of first names and nicknames. This indicator of social context was also reinforced through the teasing behavior and the increasing willingness on the part of students to say things that could be interpreted as insults but that were actually teases, as in one counseling class session when one student said "Bite me!" to another and then "laughed" to set the context for the first comment as a tease, or in the second special ed session when one of the students said "Bill sucks!" to another but in jest, as again indicated by laughter.

These behaviors increased consistently as the counseling sessions moved on and were far more prevalent in the second special ed session than in the first (during which they were essentially nonexistent).

Familiarity was also suggested in the counseling MOO sessions through comments suggesting that one student was becoming accustomed to certain behaviors from another such as when one of the counseling students made a humorous comment, and a peer indicated she was laughing and then added "as usual." There were no such obvious familiarity indications, however, in either of the special ed MOO sessions. This dichotomy was somewhat echoed with respect to the degree to which the MOO medium was a "comfortable" communication forum. During the counseling participant focus groups, all of the instructors and the five students concurred that the MOO was a very comfortable environment for interaction, even though some of those same students noted during the MOO and Blackboard sessions having had some difficulties and frustrations at times trying to keep up with the pace of the sessions. However, the special ed instructor noted in her interview that the MOO was not always a comfortable communication medium for her, saying that the effort of communicating and leading class in MOO was sometimes "laborious." She also reflected, as indicated in the MOO session transcript, that at least one of her students found the interaction less comfortable than f2f. As such, the social context elements of the MOO between the two programs were somewhat mixed, though the positive feedback from the counseling program participants was more plentiful than the negative from the special ed group.

Somewhat less mixed than the social context elements of social presence, the online communication element was strongly indicated in the MOO sessions of both programs through many of the phenomena already noted in the discussion on social interaction. For instance, online communication that supports social presence includes language and symbols that convey states of emotion such as "emoticons" which have already been noted to have been ubiquitous in the MOO sessions. Another online communication indicator of social presence which has already been discussed is language conveying understanding or a lack thereof, such as clarifying questions. As noted above, students in both programs demonstrated from the very outset a willingness to speak up when they didn't understand something and to ask questions, both of the instructor and of one another. Sometimes the acknowledgment of a lack of understanding was made in the form of a statement like "I need some clarification on that," but more often the lack of understanding was communicated through a question such as when some of the counseling students started using the acronym SAP in their discussion and another student asked, "What is a SAP?" Likewise, in the spring special ed class session, the instructor was offering examples of reminders that she issues to parents whom she serves in her practice and one of the students asked, "Can you explain that?" Clearly the online communication component of social presence was strongly indicated in these sessions.

The final element of Tu's social presence model involves what he calls interactivity, which is the degree to which the class activities promote social presence among the students. As noted above, the instructors in both programs placed an emphasis on discussion and participation from the outset (as noted in the syllabi for the four

courses) and then modeled this behavior for their students both f2f and online. Likewise, the activities in all four classes were geared toward a balance between dissemination of information and learning through the sharing of ideas. These factors alone would suggest a relatively strong interactivity contribution toward social presence for these classes. However, as noted earlier, the degree to which discussion or dissemination was emphasized varied between the programs, between the sessions, and within the sessions. For instance, the special ed MOO sessions placed a stronger overall emphasis on information dissemination than did the counseling sessions. However, the first special ed session placed a stronger emphasis on information dissemination than did the second. Hence, as the pedagogy varied so did interactivity vary between and among programs and between and within sessions. Another indicator of interactivity suggested by Tu that this researcher was able look for in the transcripts came in the form of indications that participants were enjoying the online class sessions and finding them pleasant. These indications were plentiful both within the sessions themselves ("This was great!! I really enjoyed it"), in Blackboard posts where the students talked about their MOO experiences, and in the focus group/interview sessions where both students and instructors agreed that the experience was enjoyable. It must be noted, however that there was also language counter-indicating enjoyment in both programs. For instance, in the counseling class MOO sessions during periods where students were having trouble following along or were having technical problems a number of them openly expressed frustration rather than enjoyment of the sessions. Similarly, as mentioned above, both the instructor and some of the students in the special ed program expressed some negative aspects of their

experiences doing class in the MOO. Perhaps most telling, however, was the fact that several of the students who expressed frustrations at times during the counseling series were also the very students who expressed their enjoyment of those sessions without reservation in the focus group session. Hence, despite some indications of displeasure with the MOO at times, the overall sentiment expressed by the participants in both programs during all four classes was enjoyment of the overall MOO experience.

A second indicator of interactivity as construed by Tu is the degree of responsiveness and immediacy of the interaction as measured by how often student inquiries receive a response and by the amount of intervening material between inquiry/comment and response. Generally, responsiveness was very good in all of the MOO sessions studied for this project. As noted previously, the instructors in both programs placed a strong emphasis on feedback. That, coupled with the tone of equality that promoted students to provide feedback and answers to the questions of peers resulted in almost every question that students posited during the 22 sessions receiving a reply. Unanswered questions were extremely rare (though they did happen). In addition, a very large portion of the comments made by participants received some form of feedback from an instructor or a student during the sessions. The immediacy of feedback, on the other hand, varied quite a bit during the counseling MOO sessions depending on how rapidly students were posting and how chaotic the resulting exchange was. When the pace was relatively slow, participants usually received immediate or near-immediate feedback to their posts. However, when the pace became frenetic sometimes a comment or question and its response would be separated by a considerable amount of intervening material in

the form of correspondence from and between others. During these periods, feedback was not as immediate. The special ed MOO sessions, by comparison, were consistently strong both in terms of responsiveness and immediacy of feedback, mostly because of the efforts of the instructor in both terms (though it must be noted that her job in providing feedback was a bit easier than that of the counseling instructors because there were fewer comments on which to offer feedback in special ed). Despite the negatives noted with respect to the counseling sessions, feedback and responsiveness of the MOO were rated well overall by the participants as indicated by their comments during the sessions, on Blackboard, and during the focus group and interview sessions. As one of the counseling students said during the focus group, "The feedback was great in all of the classes [in the Post-Masters Certification Program] but exceptional in the first two. Because of that feedback, I felt more comfortable contributing." Another counseling student concurred, saying that in later classes in the overall program, instructors did not do as good of a job offering feedback and this difference had a negative impact on the learning experience.

Overall, social presence, as assessed by direct indicators and through indicators consistent with Tu's conceptual model, was strongly indicated in the MOO sessions from both programs, albeit more strongly in the counseling than in the special ed sessions. Perhaps the most revealing evidence of the strength of the social presence construct in the MOO class sessions came in the form of comments participants made both during those sessions and during the focus groups and interview, a sampling of which follows:

Student in focus group: "I felt so comfortable with everyone that I could sense when someone was absent or not logged on. Does that make sense? For instance, right now, I can name everyone in class who isn't here. It doesn't seem complete in some way."

Instructor in interview: "I liked the fact, I could just walk to my desk/computer not have to worry about childcare and then be transported to being with people with a click of a mouse."

Student in a MOO session: "I am amazed at how close I feel to everyone- online" Student in a MOO session after arriving and being assailed by greetings: "I feel like Norm who just walked into the Cheers bar."

With respect to Blackboard, the asynchronous forum discussions in both programs demonstrated a number of the same language elements as seen in MOO that were consistent with Tu's three-element social presence model, in large part because of the high degree to which the Blackboard discussions demonstrated language elements of social interaction, which are a part of that model, such as expressions of emotion, disclosures and the use of first names. In addition, the Blackboard posts, like MOO, included numerous examples of students displaying a lack of understanding either directly or through the asking of questions. However, as noted above in the findings on social interaction, several of these social language elements were not strongly indicated in the Blackboard discussions, such as informal language and the use of humor. In addition, students were mixed in their comments about the degree to which they found the Blackboard sessions enjoyable and pleasant with some viewing them as enriching and beneficial and others commenting that they were "a pain." Even one of the counseling

graduate assistants intoned that whereas MOO was like attending class, Blackboard was "like checking email – it is a task you do not a process."

Perhaps the most telling weakness of Blackboard from the perspective of Tu's social presence model was in its lack of responsiveness and immediacy of feedback. As noted above, whereas the trend in MOO was toward a large volume of student comments receiving feedback and the development of dialogue, the trend in Blackboard was isolated posts, many of which received no replies. While the special ed Blackboard sessions tended to have a higher percentage of initial posts with replies than was the case in counseling (largely because of the instructor's requirement for at least two replies from each student), there were still several initial posts in every special ed class that had no replies, and the replies that were posted usually stood alone and received no feedback themselves. Likewise, the feedback that was received was anything but immediate. As is commonly the case with asynchronous forums, responses to most posts, at the earliest, came hours later and in many cases several days later. At best, then, Blackboard was mixed with respect to how well it demonstrated Tu's three elements of social presence.

More definitive, perhaps, than the mixed findings in terms of Tu's model was the absence of any of the conceptual indicators of social presence in Blackboard that were present in MOO for the simple reason that people were rarely, if at all, online in Blackboard at the same time and, if they were, they gave no indication within the forum to indicate their cognizance of it. Unlike MOO, where greetings clearly indicated participants' awareness, at the very least, of being logged into the system at the same time, the Blackboard timestamps only served to confirm when a student had last posted a

comment, which was usually hours in the past. Overall, then, the manifestation of the social presence construct in Blackboard was not nearly as strongly indicated as was the case in MOO, with respect to all four classes as indicated by all data sources.

Sense of Community

The final construct, sense of community, had numerous indicators throughout both the MOO and Blackboard sessions in both programs, as determined through content analysis using the lens of Rovai's (2002) model of the construct. However, not all such indicators were equally well represented between the online classes in the two programs. The first such indicator, language indicating concern for one another or interest in one another, was evident in abundance in both the MOO and Blackboard sessions of the counseling series. For instance, in the first counseling term, one of the students disclosed a personal crisis, as noted above, first in Blackboard and then in the subsequent MOO session. In both forums several of her peers expressed their concern and support for her and encouraged her to hang in there. Likewise in the summer term, one student faced an uncertain job placement and another, as mentioned above, was caring for her terminally ill grandmother. These situations extended through much of the summer term and several of the other students inquired about those situations, expressed their concern and offered their support through several of the online sessions, both in Blackboard and in MOO. There were also many other smaller scale examples of concern and support such as when a student in the first term disclosed a run in she had experienced with a teacher at her school and her peers expressed their outrage and encouraged her to take action. Exchanges of this nature were quite numerous throughout the counseling classes in both

Blackboard and MOO. Indeed, expressions of interest, concern, and support comprised a sizeable portion of the direct responses posted to the Blackboard forum, where responses were not plentiful. The special ed online sessions, by contrast, demonstrated no discernable indicators of interest or concern in either Blackboard or the MOO sessions. While in the early stages of both sessions students and the instructors shared information about students who they knew were unable to log on, those exchanges were merely informative and contained no expressions of concern.

Two related indicators of sense of community from Rovai's schema include language from participants that encourages questions and language through which students identify gaps in their understanding. With respect to the latter, as indicated in the discussion of social presence, above, expressions of a lack of understanding through overt statements and through questions were very common in all of the MOO classes in both programs. Language that encourages questions is a somewhat different animal. The simple analysis would be to say that language encouraging questions was plentiful in these sessions, but that view would be incomplete without accounting for the fact that some of the participants in these classes were teachers part of whose role in teaching the class is to encourage questions. An honest accounting must note that the majority of question-soliciting language in the MOO sessions came from the teachers with very little coming from the students. While the tone was largely egalitarian (as described above) and students were quick to comment and ask questions, they were far more likely to use language that encouraged comments or answers than they were to use language that encouraged questions.

Another pair of related indicators includes language through which participants request assistance of one another and language through which participants help one another, the combination of which suggests that participants can rely on one another. Language of both kinds was found numerous times throughout the MOO sessions in both programs. As noted above, students were exceedingly willing to ask questions both to request clarification (to address a lack of understanding) and to make requests of both the instructors and their peers. For instance, early in the first special ed MOO class, the students asked the instructor to slow down the slide presentation, and she acknowledged that she would oblige. Such logistical requests were relatively common in the counseling MOO sessions as well, especially in the second term. A typical example between peers included a situation in a counseling session where a student made reference to some resource materials and other students asked if the she would share those materials and she agreed to do so. Another example included a situation early in the counseling first term when a student was not sure that his posts were showing up and asked his peers to let him know, which they did. Similar exchanges were evident in Blackboard, though with less frequency. The counseling instructors, in their focus group, made reference to how the counseling students built up a sense of mutual reliance through their interaction over the course of the two terms. Said one of the counseling GAs, "the students function as a cohort, they rely on each other for academic, professional, and personal support.

One pair of indicators that were somewhat mixed in their manifestations in the MOO and Blackboard sessions points back to evidence of timely feedback and the degree to which all students participate in the class discussion and activities. As noted in the

sections above, the timeliness and volume of the feedback in the Blackboard sessions was relatively poor, with the comparatively small number of responses that were transmitted coming hours to days (and sometimes even weeks) after the comment to which they were directed was posted. The MOO sessions, on the other hand, while having much better overall responsiveness and timeliness of feedback than Blackboard, still varied somewhat within every session, with the timeliness and frequency of feedback often adversely and inversely impacted by the pace of the discussion.

Likewise, as mentioned previously, the evenness of participation was somewhat mixed across both forums and both programs. While attendance was very good in the counseling series both in MOO and Blackboard, and everyone contributed in both forums, the posting counts and frequencies in MOO and the post length tendencies in Blackboard clearly indicated that some students "talked" more in these sessions than others, with some electing to follow along, remain silent, and to "pick their spots" to jump in and contribute a comment or question. The instructors also indicated, during the focus group, that these differences are attributable somewhat to different student posting preferences, with some being quick to process and speak and others preferring to ponder, think through their comment more, compose and then post. The latter students, as indicated by their focus group session, frequently deleted their thought-through post rather than transmitting it, thereby extending their silence, because by the time they had it ready, the class had moved on to another topic and the comment was no longer timely. In the special ed MOO and Blackboard sessions, attendance was not quite as strong (though most students attended in both forums) but participation followed the same

patterns as seen in counseling with some students more prolific in posting than others in both forums. Despite these observations, the general consensus from the focus group and interview data was that, after factoring in student posting styles which account for some of the volume and frequency differences, participation was largely egalitarian.

The penultimate set of language indicators of sense of community concerns learning. Specifically, they are expressions that indicate participants are gaining an understanding of the material (learning) and language from students indicating an interest in learning, such as clarifying questions. With respect to the latter, as discussed below, students in both programs clearly indicated an interest in learning through the volume and frequency of their questions to one another and to the instructor. These students showed no reluctance to speak up when they were not clear on something. Also, the sessions in both forums of the counseling series included numerous (though not pervasive) examples of language overtly expressing interest in the topic or content being covered, such as "This is soooo interesting" or "I think this is a fascinating topic." It should be noted that language of this nature was not evidenced within the special ed MOO classes but was seen in the Blackboard sessions. With respect to language indicating the occurrence of learning, like language of interest, examples were not pervasive but were evident in a few places throughout the counseling series in both forums. During the last MOO session of the first counseling term, for instance, several students indicated that they had learned a great deal during the term. Similarly, in the summer term, students intoned several times throughout the course and especially at the end that they had learned a lot. Some even described the learning from that term as "life changing." As with language of interest,

the special ed classes demonstrated relatively fewer indications of language confirming learning than the counseling sessions, especially in MOO where at least one student offered a counter-indication ("I'm not sure how much I got out of this"). This finding was consistent with the special ed instructor interview during which she noted the difficulties in MOO of knowing whether or not her students were participating and comprehending the material. When asked to clarify, she intoned that the sensation resulted from the inability to see faces and observe nonverbal signs of confusion coupled with the students being mostly silent during the lecture portions of the MOO classes (especially during the first MOO session). In Blackboard at least, with the mandatory replies, the instructor could gauge learning from the responses.

The final sense of community indication category consists of something already discussed at length above but which bears reiterating: Language of receptivity and trust. As noted previously, the tone established early in the counseling series by the instructors was one emphasizing open discussion and respect for ideas without fear of condemnation. This tone and theme of receptivity was reinforced through the multitude of instructor feedback statements offered to class participants during the MOO sessions affirming and acknowledging their contributions to the class discussion, which led the way for the students to offer reciprocal feedback to one another both in MOO and in Blackboard (though mostly in MOO). This setting, in turn, opened the door for the large number of disclosures noted above that demonstrated the very high level of trust evident among the class participants and echoed in the focus group session responses. The special ed class participants also demonstrated both receptivity and trust, especially in the

Blackboard sessions, though to a lesser extent than was seen in the counseling classes as indicated by fewer disclosures, especially personal disclosures and disclosures of sentiment (though both did take place). Likewise, there were several indications of receptivity during the special ed MOO sessions but few manifestations of trust. As noted in the discussion about disclosures, above, this trend ran contrary to what the instructor described as the norm for the f2f sessions of both classes. According to the instructor, many of those communication elements that have been associated with trust in this study were routinely on display in the f2f meetings but were not as abundant online.

In the grand assessment, sense of community was indicated in all four subject classes but was far stronger in the online materials from the counseling class series than in the special ed series. This finding is consistent with the commentary made by instructors and class participants in both online forums and during the focus group and interview sessions in which counseling class participants clearly and frequently expressed a sense of the group connection and identity whereas special ed participants did not. For example, during the last MOO session of the spring term, the class took a moment to discuss their experiences in the class that term, and one student said, “I have experienced the cohesiveness of this group” and another said, “I FEEL connected to this class, while a third added, “The caring and compassion we feel for each other is huge with this group.” The reference to the class participants as a group was common during this discussion and at other times throughout the two term series as well as during the focus group sessions. For instance, one student in the focus group said, “Even though we didn’t see each other each week, from our conversations I still felt like a group.” Another added, “We didn’t

have the face-to-face contact, but . . . I still felt like I knew my classmates." A third student summed it up saying, "I think we showed a lot of support for each other particularly when we were facing frustrating things at our jobs....that probably helped build the trust and the closeness that our group has." The instructors concurred, saying, "I'm amazed each time how the group develops and bonds in MOO--I don't think this would happen to the same extent if we just used Bb. Also, I think the group bonds much more in MOO than they would in a F2F class." The special ed online class sessions, in contrast, had far fewer references to the class participants as a group though there were a few, as in the spring MOO session when one student said, "We are a special class," thereby suggesting a collective class identity. Perhaps most telling was when the instructor, during her interview, responded to a question about whether or not the class was a community by saying, "I never thought about it." While this may not definitively establish that sense of community did not exist or was not as strong in the special ed classes, it does imply that, unlike the counseling classes, sense of community did not manifest itself strongly in the online portions of that class.

Summary

In this chapter, the researcher set out initially to delineate the personal context and biases of the researcher as well as several significant contextual notes about the study itself, including the different attitudes about the use of MOO demonstrated by the two primary instructors of the subject classes, the limitations of the MOO transcripts that served as a primary data source for this project, the impact of absent voices, and the absence of data from the face-to-face segments of each class. With these issues, and the

factors that mitigate their impact on the study acknowledged at the outset, the researcher next set out to describe the findings from the analysis of the three primary data sources, first in terms of general descriptive and contextual issues and then in terms of the four constructs guiding the data analysis. With respect to the former, the data indicated that the participants in all four subject classes were a diverse group both demographically and in terms of their experiences, yet the students in each program shared a basic common context. The face-to-face meetings played a substantial role in the overall tone of all four courses, even though the two counseling classes met face to face only one time each.

The MOO and Blackboard sessions from all four classes were fairly well attended and contained copious amounts of material, and the posting data revealed that the MOO sessions in all of the classes involved a rapid progression of information that participants were hard pressed to keep up with. Though the primary instructors from the four classes espoused similar overall teaching strategies, they employed substantially divergent pedagogy during their respective online sessions, which manifested itself in the posting patterns of their respective students in both the MOO and Blackboard sessions. Nevertheless, the MOO sessions between the four classes demonstrated many similar communication patterns among participants including the consistent, central leadership role played by the instructors. The Blackboard sessions, on the whole, were not very conversational despite instructor expectations that students would actively participate in that forum as well.

The researcher next turned to the findings concerning the manifestation of the four constructs in the online portions of the subject classes, thereby addressing the first

research question guiding this study. The researcher found that the MOO transcripts contained references to the MOO experience that were both consistent and inconsistent with the conceptual definition of presence, making that indicator of the presence construct inconclusive, while the Blackboard sessions were devoid of such references altogether. With respect to the operational measures of presence from the analysis protocol, the MOO showed relatively few indications that the real world, rather than the virtual world, was more salient to participants during MOO sessions and relatively few indications that the technology used to access the MOO was more salient than the virtual classroom experience itself, both of which suggest that MOO session participants may have experienced at least a modicum of presence. However, the Blackboard sessions demonstrated even fewer indications of technical issues or real-world distractions than did the MOO, which would suggest that presence might have been stronger in Blackboard than in the MOO, which runs counter to the conceptual model informing this study. Fortunately, this research included a third data source: The focus group and interview transcripts, all three of which included strong and consistent language indicating that the MOO sessions yielded a perceptible sense of presence among participants that was far superior to that of Blackboard.

With respect to social interaction, both the MOO and Blackboard sessions in all four classes contained copious relational language as indicated through Burgoon and Hale's (1987) schema. Both the counseling and special ed session participants expressed immediacy and affection through greetings and expressions of pleasant emotion toward one another. Similarly, the MOO and Blackboard sessions from all four classes included

language of receptivity, composure as opposed to tension and equality rather than dominance. Participants actively affirmed one another's comments and positions, expressed an interest in what one another had to say, and "spoke" in calm tones even in disagreements. There were no incidents of flaming or harsh conflicts and no examples of one person actively trying to invalidate the position of another. One clear difference between the MOO and Blackboard sessions, however, was with respect to the use of informal language. While both media equally demonstrated colloquialisms, slang, and expressions of emotion, the MOO sessions were replete with humor and reactions to humor including jokes, banter, playful sarcasm, laughter, giggling, and eye rolling, all of which were conspicuously absent from Blackboard. Also, substantial differences were noted with respect to language conveying trust. Whereas trust indicators, most notably disclosure statements, were plentiful in the online materials from the counseling classes, they were relatively sparse in the special ed materials, especially the MOO in which they were almost nonexistent.

Turning to social presence, the MOO transcripts from all four classes demonstrated numerous indications consistent with the conceptual definition of the construct in which participants acknowledged the salience of the arrival and departure of others whereas Blackboard was devoid of such language. Participants primarily drew their awareness of one another's presence during each MOO session from the exchange of dialogue. This was made plain through instances in the data where silence on the part of a participant was perceived by his peers as social absence. The MOO transcripts in all four classes also contained abundant language consistent with Tu's (2002) three-part

model of social presence. A social context consistent with social presence was indicated through the abundant relational language noted above as well as through pervasive (though not universal) language suggesting that participants were comfortable communicating within the MOO forum and that participants were familiar with one another. Actual online communication consistent with social presence was more consistently indicated across both programs through plentiful expressions of emotion and expressions of a lack of understanding (such as clarifying questions). Lastly, all of the MOO sessions demonstrated strong interactivity through the use of pedagogy designed to generate discussion, expressions of enjoyment, and strong responsiveness and immediacy of the interactions, though all three were more consistently strong in the counseling sessions than they were in the special ed MOO sessions. Blackboard, on the other hand, demonstrated weaker social context due to the absence of some relational communication elements and weaker interactivity due to the lack of responsiveness and immediacy of its interactions. All told, social presence was indicated to a slightly higher degree in the counseling classes than in the special ed classes, and to a far greater degree in MOO than in Blackboard.

Finally, the sense of community construct, evaluated in terms of Rovai's (2002) model, was strongly indicated in the counseling class online sessions (both MOO and Blackboard) through expressions of interest and concern, language indicating mutual helping and reliance, expressions of interest and learning, and language of receptivity and trust. These indicators were far less common in the special ed class online materials from both forums. The MOO and Blackboard differed in both programs with respect to

timeliness and volume of feedback and evenness of participation, both indicators of sense of community. The focus group and interview comments further reinforced this finding that sense of community manifested itself far more strongly in the online sessions of the counseling classes than in the special ed online meetings, but was fairly consistently indicated between MOO and Blackboard across all four classes.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Having largely addressed the first of the four research questions concerning how the four constructs of presence, social presence, social interaction, and sense of community manifested themselves in the courses analyzed for this project, it is useful prior to addressing the remaining three research questions to revisit briefly the important role that having four different class settings from two different programs has played in this study. As was evident in the material from Chapter IV, the two settings were far from 100% redundant with respect to the manner in which the four constructs manifested themselves. In fact, while there were a number of consistencies between the two programs and four classes, there were also numerous instances where they diverged, and those divergences more often took place between the two programs rather than between classes within a program. As described in Chapter III, the value of employing settings that are not fully homogeneous is in the ability to note commonalities and divergences between the settings which then help to qualify and contextualize the findings. For example, the substantially different per student posting frequencies evident between the counseling MOO sessions and their special ed counterparts, and also between the first and second special ed sessions, suggests that a factor (or factors) other than medium itself was impacting on participation rates. Likewise, the highly divergent degree to which the counseling classes and special ed classes exhibited language of similarity and depth

(disclosures) across all media indicates that a factor other than medium was influencing participant communication behavior. In the same manner, examining classes that use two different online media (MOO and Blackboard) rather than just the online virtual environment that is the focus of this study serves to permit comparative findings that temper and qualify the conclusions. For example the finding that the language in both MOO and Blackboard across all four class settings supported social interaction in most of Burgoon and Hale's categories with the notable exception of informal language and humor allowed the researcher to focus on how the virtual environment supported those specific elements of social interaction whereas Blackboard did not. The value of these divergent settings and the insights from the different ways in which the constructs manifested themselves therein is reflected in the ensuing consideration of the remaining three research questions.

The Impact of the Virtual Environment on the Constructs

Presence

The second of the four research questions guiding this study concerned how the use of a virtual environment as an online instructional forum contributed to the development of presence, social presence, social interaction, and a sense of community among students in an online course. Going into the study, the researcher anticipated that the virtual environment would foster a sense of physical presence among participants and that said sense would be transmitted primarily through the spatial theme of the MOO, as contrasted with Blackboard which lacks a spatial theme and which was expected to lack a sense of presence. While the findings supported the presumption that the virtual

environment would support a sense of presence far greater than that evident in Blackboard, the data did not suggest that the spatial cues were the primary means through which presence was communicated or that they played any substantive role in fostering presence among class participants. Indeed, while the spatial elements built into the MOO system, such as the use of "rooms" and the language of "arriving" and "departing" to describe people logging in and out may have contributed to the establishment of a subtle context that promoted a sense of presence, the primary feature of the MOO that drove presence among class participants was the rapid, synchronous nature of the communication it supported and encouraged which demanded participants' attention.

A central observation about the MOO environment, based on the posting frequencies, comments within the sessions, comments on Blackboard, and comments in the focus group and interview sessions, was that it involves fast-paced communication that demands the attention of the user in order to keep up. Though the substantial impact that the fast-pace of the discussion had on student experiences was noted by the researcher during the MOO session transcript reviews, it was the focus group comments by participants from both programs that highlighted the centrality of this phenomenon to the manifestation of presence. This one factor, above all others, was what prompted participants to focus their attention exclusively on the virtual environment to the exclusion of their real-world surroundings during MOO class sessions. The absence of this one factor, the ability to support rapid, synchronous communication, was also the reason why Blackboard, despite its reliability and relative ease of use, did not generate an analogous sense of presence among users. One limitation to these conclusions

concerning the impact of the virtual environment upon the presence construct centers on the lack of focus group data for the special ed students. Because of the subjective nature of the presence construct, the researcher relied heavily upon the reports of participant experiences from the focus group and interview sessions to supplement the indicators of presence contained in the online class transcripts themselves. The absence of focus group data from the special ed students, however, made an evaluation of the presence construct in the special ed online sessions far more difficult to assess. As a result, the conclusions about the medium impact on this one construct were primarily drawn from the counseling class data, and were merely consistent with the available special ed class data. The member checking process served to mitigate this limitation by allowing the special ed students to review these findings and conclusions and to provide feedback if the researcher was misrepresenting their experience. However, as noted below, the member checks did not yield any responses, suggesting the possibility that the special ed students did not read them. Recognizing this limitation, the researcher compensated somewhat by asking in-depth follow-up questions of the special ed instructor through personal communications in order to gain a more thorough understanding of her own perceptions. The adverse impact of the absence of a special ed student focus group was not as pronounced with respect to the other three constructs, however, each of which had more associated language indicators that could be assessed from the transcripts than did the presence construct.

The finding concerning the impact of MOO on the development of presence is interesting given one of the presupposed limitations of MOO as compared with other

virtual environments. The preponderance of the literature on presence suggests that a virtual environment such as MOO, with its relatively limited graphics and heavy reliance on text to deliver its spatial theme, should be far less capable of establishing presence than an environment with a rich, lifelike, 3-D graphical display such as Second Life (www.secondlife.com). Yet while some studies (Nowak & Bicca, 2003, Picciano, 2002, among others) have suggested that interaction can support a sense of presence among learners, the present study goes farther in suggesting that fast-paced synchronous interaction, even in the form of plain text and in the absence of highly realistic graphics, is alone sufficient to establish a highly functional and palpable sense of presence among users. These findings suggest future research comparing the presence effect of a primarily text-based environment, like MOO, with a more graphically realistic environment, when both support and utilize similar fast-paced, synchronous interaction among class participants. These findings also suggest further research comparing the sense of presence generated by MOO with that of an alternative forum such as Instant Messenger or IRC chat which permits the same kind of fast-paced, synchronous exchanges afforded by MOO but without the spatial cues. Such a study would highlight the contribution that MOO's graphical and textual spatial cues make to users' experience of presence.

Social Presence

With respect to social presence, there were four medium factors that were indicated as providing the primary support for social presence in the online class sessions. The first was the ability to broadcast slides thereby establishing a mutually experienced

context for discussion. As noted in the findings, the instructors in all four classes copiously utilized the slide broadcast feature of MOO to both disseminate information and to stimulate discussion. In the latter mode, after the display of a slide, participants would begin commenting on the slide thereby affirming to other participants that they were all seeing the same thing. Those that couldn't see the slide or had the wrong one were quick to ask for it to be displayed so they could also take part in the shared class discussion context. As suggested by Tu (2002), this shared context immediately established through the broadcasting of slides facilitated social presence by supporting the perception among participants of the MOO as a social medium. The second medium factor that positively influenced social presence was the emote feature, allowing participants a method of communicating emotion and sentiment that, in the words of the counseling instructor, made the experience "real." The ability to offer winks, nods, giggles and hugs which the MOO emote feature permitted and which Blackboard could not emulate, helped to foster the exchange of sentiment that, in turn, promotes and indicates social presence. In Tu's conceptualization, this feature of the MOO substantively added to the social nature of the online communication and took it to a level that the asynchronous discussion forum could not match.

The third medium factor in MOO that supported social presence and that was absent from Blackboard was the manner in which the MOO announced the arrivals and departures of participants, thereby enhancing the sensation that participants were "walking through the door" as the counseling instructor put it. These announcements always generated greetings from those already in the virtual classroom, thereby

immediately establishing a mutual sense of social presence among those in the "room." It was during one of these warm up periods that a counseling student, upon arriving and being showered with greetings, said that he felt like "Norm walking into the Cheers bar": An effective description of social presence. The medium factor that most strongly communicated social presence to participants, however, and through which they assessed the presence of their peers was the same factor that primarily promoted physical presence as described above: Synchronous communication. Though the MOO offers two graphical interfaces that allow participants to see who is "in the room" with them, there is no evidence to suggest that anyone other than the counseling instructors used those displays to gauge social presence. Rather, the posting of comments, more than any other factor, was the means by which participants knew one another were "there" in the session. As the instructors in both classes noted in their interview sessions, you don't exist to others in a MOO session if you don't post (others don't see you), and you don't perceive others as being aware of your existence if they don't respond to your posts (you don't see others seeing you). This was evident in the instances where a student who was silent for long periods was presumed by his peers to be absent. Just as was the case in the online student interactions studies by Haythornthwaite and colleagues (2000), such lapses in participation resulted in these students' "fading" from the group consciousness. Hence, through typing and transmitting comments, questions, and expressions of emotion, students made it known that they were present in the sessions. Then, the students were reinforced in their perception that others were aware of their presence through receiving immediate (or near immediate) feedback. With its inability to foster

such a high level of interactivity, as Tu (2002) calls it, the Blackboard medium was unable to support the level of social presence seen in MOO.

Social Interaction

Turning to social interaction, the comparison of the language patterns in Blackboard with those in the MOO revealed that the Blackboard medium was capable of facilitating many of the same kinds of social interaction as was the MOO including expressions of sentiment conveying warmth and immediacy, expressions of receptivity to the contributions of others, and expressions conveying composure or tension (usually the former). Hence, the present study supports the conclusions of Walther (1996, 2002) that asynchronous discussion forums, given enough time and student engagement, can support relational communication. However, more salient were the differences in relational communication patterns between the two media which included the degree of formality and the use of humor. This distinction held true across all four subject classes, underscoring its consistency and suggesting a medium-related factor as instrumental in driving it. On first analysis, the two MOO features most likely to facilitate the humor and informal communication seen in MOO but largely absent in Blackboard were the synchronous nature of the communication and the ability of students to "emote" in the MOO. Just as with presence and social presence, it could be that the fast-paced synchronous communication afforded by MOO fostered humor, teasing and general informality in ways that the asynchronous forum could not. As is commonly noted, humor requires timing, being in the moment and seizing an opportunity to react quickly to something said by another, something that cannot be done effectively when posts are

separated by hours rather than seconds. This may help to account for the pronounced absence of expressions of laughter seen in Blackboard as compared with the MOO. In humor, laughter is inappropriate after the moment is gone, and this concept is consistent with the conclusions drawn by Kanuka, Collett, and Caswell (2002) that a lack of spontaneity in asynchronous discussions was a substantial barrier to the development of social interaction therein. Also, as was noted by the instructors in the counseling focus group, the use of emote substantially contributed to the effective communication of feeling in the MOO environment. Said one of the counseling teachers, "I was continually amazed how well the affective experience of students came through. It is just different but the messages are still there . . . sometimes it comes in the form of silence other times emoting or even the pace of responses." As highlighted by Oren, Mioduser, and Nachmias (2002), the text-only nature of the communication media used in most online classes requires participants to innovate and use alternative means of communicating social meaning. The present study would suggest that the availability of one such alternative means, the emote function in MOO, made a substantive difference in the communication experiences of participants in that forum as opposed to Blackboard.

While the ability to emote and communicate synchronously in MOO and not in Blackboard may plausibly account for the differences in social interaction patterns seen between the two forums, it must be noted that other factors could also have played a role. One possibility, for instance, is the differential teacher effect between the two media, since the instructors were copiously involved in the MOO sessions but hardly contributed to the Blackboard sessions at all. Perhaps the humor and informality demonstrated

frequently in the MOO sessions by the instructors prompted similar behavior from the students, whereas the absence of this modeling in Blackboard had the opposite effect in that forum. The one consideration that tends to work against teacher effect as the primary factor driving the differing social interaction patterns in Blackboard and MOO is the fact that the instructors in all four classes had already set the tone for communication within the class and continually reinforced it during each term in the primary meeting setting (f2f for special ed and MOO in counseling). Even in the absence of modeling in Blackboard, then, one would reasonably expect the communication patterns established in the other forums to carry over to the asynchronous forum, if it were capable of supporting them.

A third factor, other than medium difference and instructor effect, that might account for the social interaction differences observed between MOO and Blackboard is pedagogy. Both instructors used similar pedagogy for their Blackboard sessions which consisted of the establishment of a prompt with specific issues that each student was required to address in an initial response. Following the initial response, the expectation was that students would respond to one another's initial posts. That expectation was spelled out explicitly in the special ed classes and made implicit in the counseling classes. In this way, the Blackboard sessions were in some ways more like a weekly assignment than a class meeting resulting in posts with a tone more akin to the submission of a quiz response or short essay rather than a conversation among peers. This "assignment" tone may have been reinforced by the instructors' abstention from the "discussion" for the most part and would be consistent with Picciano's (1998) observation that participation in

an asynchronous discussion forum is seen by students as being more laborious in terms of the time and effort necessary to interact than do synchronous exchanges. This "assignment" pedagogical context may account not only for the relative lack of informal language and humor but may also explain the relative lack of dialogue in Blackboard across all four classes examined. In both programs, as noted previously, the Blackboard posts tended to stand alone, whether initial posts (as were the norm in counseling) or initial posts and required replies. The overtly communicated requirement of a specific number of replies from every student in the special ed sessions only generated more stand-alone posts and did not translate into dialogue. If anything, the counseling sessions exhibited more examples of conversation/dialogue even though no overt reply requirement was used. In this way, these findings were consistent with those of Dysthe (2002), Tiene (2000) and others who also observed a lack of dialogue and a preponderance of "parallel posting" in an asynchronous discussion forum.

All told, that qualities of the media involved had an impact on social interaction appears likely given the role that media factors have been shown to play in terms of generating presence and, more importantly, social presence. Nevertheless, instructor involvement and pedagogy also play an important role in fostering social interaction in any forum, f2f or online. Unfortunately, designing a study to compare social interaction in different media which completely controls for pedagogy and instructor involvement is impossible because the types of pedagogy and manner of instructor involvement are, in part, confined by the qualities of the media employed. As noted in the discussion above,

Blackboard and MOO function in different ways with respect to communication, making it impossible for instructors to conduct class in exactly the same way in both forums.

Sense of Community

Finally, of all the constructs, the direct medium impact on sense of community was the least clear. There was only one medium-specific characteristic that had a direct bearing on sense of community: The degree to which the forum supported timely feedback. As noted in the findings, the MOO was far superior to Blackboard in all four subject classes with respect to the volume of feedback participants received and with respect to how quickly they got that feedback. At worst, feedback in a MOO session would come a few minutes after a post was made, and most of the time students could reasonably expect to receive some kind of feedback to their contributions. In Blackboard, the earliest someone might expect a reply was within a few hours, but the reality was that many of the posts did not receive replies, even in the special ed sessions where replies were required. As such, to the extent that it supported timely feedback, the MOO medium contributed to the development of sense of community among learners. In basic terms, the findings herein were consistent with those of Ellis (2003) and Woods and Ebersole (2003) who both noted the important role that synchronous communication played in the development of sense of community. However, given the complexities of the sense of community construct and the ways in which it develops, the findings suggest more indirect ways in which the virtual environment may have contributed to the development of sense of community, namely by facilitating the establishment of an

environment in which sense of community could arise primarily from online interaction. This concept is addressed more fully in the discussion of research question number three.

Medium, Pedagogy, and Instructor Effects

In summary, the synchronous nature of MOO coupled with its ability to display slides and the "emote" functionality, allowing students to express sentiment, were the key medium factors of the online virtual environment that positively contributed to the development of presence, social presence, social interaction, and sense of community. However, these medium functionalities only opened the door for the phenomena observed in the subject classes and did not generate them on their own. As noted above numerous times, and as suggested by the literature and the model proposed at the beginning of Chapter IV, the capabilities of the virtual environment merely offered a vehicle for the instructor effect observed in this study which had an enormous impact on all of the phenomena discussed so far. The prolific, near-immediate feedback observed in these classes, for instance, would not have come about, despite the ability of the medium to support synchronous communication, had the instructors not demonstrated the commitment and effort to fully utilize the medium to provide that feedback. The role of the instructor in realizing the potential of the medium was made evident during the counseling student focus group session during which some of the students talked about how the instructors in some of the other classes in the counseling post-masters certification program (which were taught by instructors other than those who taught the classes observed for this study) were not as quick and thorough in offering feedback. As

a result, the students sometimes felt ignored or misunderstood when their posted comments received no response.

In addition, the impact of the capabilities of the virtual environment on the manifestation of the four constructs was clearly mitigated by the pedagogy employed by the instructors during the online MOO sessions. As the findings indicated, the MOO forum clearly supports multiple forms of pedagogy, and the pedagogy used has an impact on the pace and nature of student postings. Whereas a discussion prompt tossed out to the class with the expectation that everyone can respond at once might generate a rapid flurry of chaotic, voluminous discussion (as was commonly seen in the counseling MOO sessions), a lecture mode in which many slides are displayed in succession with the expectation that students will only speak up if they have questions might generate long stretches of silence (as was seen in the first special ed MOO session). Clearly, then, the degree to which the medium impacted upon the manifestation of the four constructs in the online sessions observed for this study was a function of the manner in which the instructor designed and implemented pedagogy in those sessions.

The role of the instructor in effectively utilizing the capabilities of the virtual environment and the impact of the instructor's approach to the teaching on the manifestation of the four constructs cannot be overstated. Though the purpose of this study is not to compare online and face-to-face learning, a comparative theme that was communicated by both the student and instructor focus groups from the counseling classes concerning the level of interaction in the MOO sessions speaks to the impact that the combination of medium, pedagogy, and instructor activity can have in online classes.

Participants in both focus groups suggested that through setting the tone for egalitarian communication overtly and through modeling early, and then reinforcing it through pedagogy, active facilitation, and abundant feedback using the combination of technology and pedagogy available in MOO, the counseling classes were not only interactive, but even more interactive than a f2f class. The common refrain was that this was accomplished due to the openness supported by the forum and encouraged by the pedagogy and modeling of the instructors. Nobody had to "raise their hand" and be recognized before they could contribute to the discussion, so therefore, everyone was able to talk at once, meaning that everyone could be writing and posting at the same time and not interrupt one another. The result, all agreed, was a volume and pace of discussion that no face-to-face class could match. As one of the counseling students put it, "The good thing about MOO is that everyone actually gets to talk more than if we were together in person. We couldn't all talk at once like we do online."

Another way of stating the role of pedagogy and instructor involvement in the manifestation of the four constructs in different online settings is to highlight the fact that the four constructs manifested themselves with differing relative strengths in the special ed online sessions than in the counseling sessions never mind the fact that all four classes utilized the same online media. Even despite the "advantage" of having the preponderance of their meetings f2f, the special ed online sessions displayed weaker manifestations of social interaction, social presence, and sense of community than did the counseling classes, which only met f2f twice over the two-term period. If nothing more, these discrepancies illustrate that the use of any specific medium or set of media alone

does not guarantee a certain amount of interaction or a strong manifestation of any of the constructs examined in this study. Rather, the use of those media only offer the tools which, in conjunction with pedagogy, instructor, and student characteristics, can generate the phenomena strongly observed in the counseling online sessions and more weakly observed in the special ed online sessions. The findings and resultant conclusions, then, support the conceptual model presented in Chapter 4 which posits social presence and social interaction in online class sessions as a product not only of media factors, but also of pedagogy, student characteristics and instructor characteristics. One inconsistency of the model with respect to these findings, however, is its presumption that presence is largely a function of medium characteristics and, to a lesser extent, student characteristics. Instead, just as with social interaction and social presence, the findings point to presence as a combined product of medium, pedagogy, and instructor characteristics primarily, with student characteristics still serving a possible lesser role. In this way, the present findings support the work of those researchers (Canning, 2002; Anderson, Rourke, Garrison, and Archer, 2001) who cited the powerful role that the instructor plays in shaping student learning experiences online and contradict the conclusions of Oren, Mioduser and Nachmias (2002) that a weak instructor role promotes more student interaction in online courses.

The Mutual Influence of Constructs

Turning to the third research question guiding this study, concerning how the four constructs of presence, social presence, social interaction, and sense of community mutually influence one another in an online class, the findings from the four subject

classes served to support several aspects of the conceptual model built from the literature and offered in the preceding chapter. One obvious factor entering into this discussion is the fact, evident from the analysis protocol guiding this study and the literature on which it is based, that these four constructs are defined in ways that have overlapping conceptual components. For example, informal language is a component and indicator both of social presence and social interaction. Likewise, timely feedback is a factor both of social presence and sense of community. This discussion seeks to build on those presumed theoretical relationships by exploring how the manifestations of the constructs overlapped, influenced, and shaped one another in the realtime unfolding of these four subject classes.

Presence and Social Presence

As indicated in the discussion above, presence and social presence in the online portion of these classes were both primarily established through the interaction of the MOO's capabilities, pedagogy, and instructor engagement in all four classes studied, factors that were in place from the very first moment of the very first MOO session in all four classes. Correspondingly, indicators of both constructs were evident in the transcripts from the outset of each term, suggesting that at some minimum level, social presence and presence were in play from the very beginning and helped to set the context for everything that would happen in the online sessions observed from that point on. Also, interestingly, the only indication of a change trend in presence across any term was the reduction in technical problems after the very first MOO session of each two-class series. After that, all of the indicators leveled out and remained relatively consistent

throughout the remainder of the sessions, suggesting that after an initial period of getting used to and working the bugs out of the software, presence was more or less a constant during the MOO sessions. This view is consistent with the descriptors of presence given by instructors and students in the focus group and interview sessions in which they talked about presence as an intrinsic quality of the class environment, rather than something that built up over time. On the other hand, there were indications that social presence strengthened over the course of the initial term in the counseling series and between the two MOO sessions in the special ed series, and this increase was related to the development of the third construct: Social interaction.

Social Interaction and the Presence Constructs

Social interaction, like presence and social presence, was also indicated in both MOO and Blackboard from the outset of the online component of all four courses, suggesting that the initial online learning context established through the media, pedagogy, instructor and student characteristics, and also through whatever f2f meetings had taken place in all four courses prior to the first online session was able to support at least a baseline level of social interaction in both online forums. However, the social interaction in the MOO environment changed quite rapidly over the course of the first counseling term, with the addition of more humor, less formality, an increasing propensity to make disclosures, and more expression of emotion as students began to get the hang of using the "emote" feature and "got to know one another." Some of these same social interaction changes were also evident in the Blackboard discussions, as disclosures increased and became more personal and as expressions of emotion became

more common. Given that such relational communication is one of the components of social presence, as conceived by Tu (2002), one would expect that increases in social interaction would be accompanied by increases in social presence, and the observations from the counseling classes bear that out. As the counseling students in their focus group intoned, after an initial period of getting comfortable with one another, the class became really "connected" rather than feeling "out there on your own." The counseling instructor also underscored the manner in which increases in social interaction impact on social presence, saying that increased emoting made the class seem more real. Similarly, there were indications from both the instructors and the students that the increases in social interaction were themselves supported and reinforced by the context of social presence. Said one student, "There were . . . many 'events' in peoples lives that they were willing to share as we gathered for class and were waiting for everyone to arrive." As noted previously, that "warm up" period of initial gathering was a time in each session when social presence was made salient through the display of arrival messages and the resultant greetings. It was also during these "off topic" periods (which also included breaks and wrap ups) that the freedom from content constraints allowed participants to focus almost exclusively on social interaction. These moments serve as a microcosm of a phenomenon strongly indicated throughout all of the studied classes and consistent with existing literature (Picciano, 2002; Tu and McIsaac, 2002): Social presence and social interaction mutually reinforcing one another and growing beyond their baseline levels.

The Rise of Sense of Community

As social presence and social interaction built upon one another in a context

characterized by openness, egalitarian participation, timely abundant feedback, and receptivity, class participants deepened their familiarity with one another which promoted the beginning of group identity development and sense of community as described in the literature (Brown, 2001; Wegerif, 1998). The development of sense of community as familiarity changed to trust in turn reinforced the deepening and broadening of social interaction in the sessions, as made evident through more frequent and personal disclosures and expressions of mutual interest, concern, and support. These patterns of social interaction, in turn, further strengthened the developing sense of community among class participants. The end result of this process was the kind of bond described by the participants of the counseling class series, who were clearly a closer group of people at the end of their online class experiences than they were at the beginning when they were mostly acquaintances.

The role of trust development in the establishment of sense of community among the learners observed in this study cannot be overstated. The instructors in both counseling classes used a combination of media, pedagogy, and modeling to establish a forum of open and egalitarian communication in which anyone could talk and everyone was encouraged to give feedback. The openness and comfort of this communication context, reinforced through a sense of presence and social presence on the part of the class participants, yielded a rapid escalation of social interaction that promoted the relatively rapid building of trust observed in this study. In this way, the present findings sharply contrast with those of MacDonald and Thompson (2005) and those of Kanuka et al. (2002) on the basis of which these researchers collectively concluded that, due to a

lack of social interaction, online classes could not support the kind of trust seen in f2f settings. The development of trust, and the deepening of social interaction resulting from it, more than any other factor, promoted the development of sense of community among learners in the counseling series, and this conclusion is consistent with those drawn by Poole (2000) who also found trust to be central in the development of community among online learners.

Blackboard and the Constructs

Turning to the role of the Blackboard sessions in the manifestation and mutual influence of the four constructs, all of the informants interviewed for this study across both programs were quite clear in their perception that the interaction patterns in Blackboard were a reflection or derivative of those developed and displayed in the primary class meeting setting (MOO in the counseling series and f2f classroom in special ed). This would suggest that the Blackboard communication patterns were more the product of the processes through which that language developed rather than a factor influencing those processes. This would be an overstatement, however, because the discussion in the Blackboard sessions in both programs built upon the class proceedings in the primary forum and also carried over into the proceedings in the primary forum, at least in the counseling series. The pattern of communication evident in both the MOO and Blackboard sessions in the counseling series gave evidence that the latter served not only to reflect but also to reinforce the communication patterns developing in the MOO. For instance, as disclosures began to become more substantial and more personal in the MOO, the same trend was seen in the Blackboard discussions, and some of those

disclosures made in Blackboard were expounded upon in the subsequent MOO session. As such, the use of the Blackboard sessions to compliment and reinforce the academic topics being covered in MOO served a similar complimentary and reinforcing role with respect to the development of social interaction and sense of community in the counseling classes.

As the literature on asynchronous forums (Picciano, 1998; Cartwright, 2000; Tiene, 2000) would suggest, the Blackboard discussions in all four classes tended to exhibit longer, more thought-out statements and responses than did the synchronous MOO. Whereas the longest MOO contribution was no more than a few lines, the Blackboard contributions in all four classes were frequently a few paragraphs in length. All of the instructors and students interviewed for this study concurred that Blackboard allowed more reflection and thought in student contributions than did MOO, and in doing so, Blackboard added value to the class. However, all of the informants were equally unified in their sense that the Blackboard discussions were not as interactive as those in the MOO. While this difference is certainly attributable to the relative absence of the presence and social presence constructs and to some of the relational language deficiencies noted in Blackboard, such as the relative lack of humor, one additional factor stands out: The lack of dialogue. As noted in the findings, the Blackboard sessions in all four classes primarily involved parallel, stand-alone posts with relatively few examples of students responding to one another, even though much of the language employed in the posts was relational in nature according to Burgoon and Hale's schema. This contrasts sharply with the MOO sessions in all four classes where feedback and dialogic exchanges

were the norm. This finding in conjunction with the informants' perception of Blackboard as far less interactive than MOO suggests that it takes more than relational language content for a discussion to be perceived as socially interactive. In addition, for social interaction to take place, the discussion must also contain dialogue between participants.

The Counseling - Special Ed Divergence

Certainly evident to anyone reading this chapter thus far, the conclusions concerning the impact of medium on the four constructs and the discussion on the mutual influence of those constructs have been based largely on the online phenomena observed in the counseling series, a pair of consecutive classes conducted primarily online with only one f2f meeting per term. In turning the focus to the special ed series, then, one might reasonably expect to see stronger manifestations in both online forums of the constructs observed in the counseling classes, especially social presence, social interaction, and sense of community. This expectation would be reasonable, first of all because the special ed students, unlike the counseling students, used the f2f classroom as their primary meeting forum, which the literature on online learning presupposes as better suited to the development of these constructs than any online forum. Secondly, the expectation would be reasonable because the special ed students had more opportunities for exposure to one another than the counseling students over the course of the two terms in which they were observed because the former were taking other classes together in addition to the ones observed for this study, again conducted mostly f2f. Lastly, the expectation would be reasonable because the counseling class observations have already

established that an online forum can both support and display strong social presence, social interaction and sense of community among a group of students. However, the expectation would have been incorrect, because counter to conventional wisdom, the special ed online sessions demonstrated somewhat weaker manifestations of social presence, social interaction, and sense of community than did the counseling sessions.

The fact that the special ed classes revealed a different outcome pattern with respect to the four constructs than did the counseling series yields substantive insights into the developing model of how the four constructs develop within the larger context of online and mixed forum learning. So how could it be that a class meeting primarily online would demonstrate stronger online manifestations of these constructs, especially social interaction and sense of community, than a class conducted primarily face to face? The findings point to four possible factors: Student characteristics, instructor characteristics, characteristics of pedagogy, and a specific subset of the first two – the degree of participant investment in the online forum. To begin, student and instructor characteristics, such as personalities and the relative comfort of both with computers and online technology, have already been noted in the literature as having an influence on learning experiences online (Valenta, Therriault, Dieter, and Mrtek , 2001). With respect to the special ed students observed for this study, the instructor revealed that this group was the first cadre consisting of students from two very different specialties within the major to go through the two-semester series together. In the past, students from one of the two specialties had been exempt from this two class series. This mixing of students, said the special ed instructor, yielded a group that was slower to show cohesiveness than

any of the others she had taught in this series, not beginning to "gel" until midway through the second term. Interestingly, the MOO and Blackboard sessions (especially the former) observed for this study support her contention by exhibiting stronger manifestations of social presence, social interaction and sense of community in the spring than the sessions in the fall.

As for the possible impact of instructor and pedagogy characteristics on the lower construct manifestations in the special ed online sessions, one sees a stark contrast between the pedagogy and instructor modeling demonstrated in the counseling MOO sessions and that seen in the two special ed MOO sessions. Whereas the pedagogy employed by the counseling instructors centered on using the slide broadcasting feature of MOO to create a shared context for discussion and the teachers actively encouraged that discussion and modeled the open exchange they wanted to create, the special ed instructor displayed slides primarily as a means of information dissemination and for much of the session encouraged students to read them silently rather than commenting. This difference in pedagogy and instructor involvement resulted in special ed sessions with a far lower rate of synchronous communication than seen in the counseling sessions, and as discussed above, the pace of the synchronous communication plays a substantial role in creating a sense of presence and social presence and helps to create the context that promotes social interaction and sense of community. This conclusion is consistent with and also helps to account for Ellis' (2003) finding that instructor and pedagogy factors that serve to reduce the level of synchronous interaction also serve to adversely impact on the sense of community in an online course.

One last factor that may help to account for why the special ed online sessions exhibited social presence, social interaction, and sense of community more weakly than did the counseling sessions is the relative investment of the instructor and students in the online medium. The concept of investment in the online medium was suggested through comments made by the key informants during the focus group and interview sessions during which one of the counseling instructors suggested that the counseling students worked harder and more quickly at learning how to use the MOO than they did Blackboard because the MOO was their primary class meeting forum and Blackboard was merely seen as a supplement. Given that the counseling students only met f2f once per term, they had to invest themselves not only in learning how to use the MOO but in actually using it to communicate because to do anything less would have been tantamount to being absent from the course. This same idea was echoed by the special ed instructor when she suggested that her students may have lacked motivation to interact actively in the online class sessions because, "They knew they would be able to talk face to face the next week." This conclusion is consistent with the findings of Walther (2002) and Oren, et al., (2002) that online interaction leading to online community takes an effort and time investment from students. The conclusion is likewise supported by Brown's (2001) findings that students' progress toward community building in an online course was dependent upon the amount of time and effort they invested in the online class sessions.

Summary on Mutual Influence

Overall, observations from all four subject classes lend support to and inform the

literature-based model of how the four constructs of presence, social presence, social interaction, and sense of community influence one another. The baseline presence, social presence and social interaction supported by the online environment and pedagogy used in the class serve as a context from which the remainder of the process model springs forth. The extent to which (a) the medium permits dialogic, synchronous interchanges between students and the establishment of a mutually experienced context for discussion, (b), the pedagogy takes full advantage of those capabilities, (c) the instructor actively models a highly interactive and informal style that promotes egalitarian participation and comfort among students, and (d) the students are motivated to invest themselves in the online interaction will set the stage for everything to come. The extent to which the four preceding factors are maximized determines the degree to which presence, social interaction and social presence are initially manifested for the participants in the online sessions and the likelihood that social interaction and social presence will begin to mutually reinforce one another, serving as a vehicle through which participants move from becoming acquainted to becoming familiar with one another. As social interaction builds and incorporates voluminous immediate feedback incorporating humor, warmth, and receptivity to the ideas of others, trust is encouraged and leads to disclosures. Over time, continued interaction strengthens trust and the disclosures grow more frequent and more personal, encouraging expressions of concern and support which constitutes the development of sense of community among the class participants. Note, however, that the extent to which the media or pedagogy, teacher characteristics or student characteristics serve to minimize synchronous interaction and shared discussion context,

the development of the four constructs and everything that comes after is compromised.

Looking back to the literature review from Chapter II, the conclusions from the present study are consistent with and expand upon the findings from prior studies on the factors that contribute to the development of sense of community. For instance, the present results are consistent with Swann's (2001) conclusion that strong content, teacher, and student interaction lead toward the development of community in online classes, though the present study goes further in delineating how the use of a virtual environment supports such interaction. Similarly, the present study supports Wilson's (2001) findings that sense of community in online classes is supported through extended opportunities for collaboration, the use of user-friendly communication tools, and creating an environment of mutual respect among participants. The current project clarifies Wilson's conclusions by delineating how one user-friendly communication tool contributes to creating both opportunities for collaboration and an environment of mutual respect. With respect to the work of Brown (2001), Chidambaram and Bostrom (1996) and Wegerif (1998), the current study offers insight into the mechanics of how online class sessions contribute to the progression that a group of participants traverses in moving from acquaintances to a class community. Finally, the observations and conclusions described herein are consistent with the factors and models delineated by Rovai (2002b), Ludwig-Hardaman (2003), and Wilson et al. (2004), but go beyond mere support of those models by describing how the factors play out in terms of the four constructs of presence, social presence, social interaction, and sense of community.

The Constructs and Student Learning Experience

The final research question to be addressed by this study turns the focus toward the last part of the conceptual model discussed above. It concerns how the interplay of presence, social presence, social interaction, and sense of community in an online class impacts upon student learning experiences, including students' sense of isolation and degree of persistence. The answer to this question, as informed by the observations from the four classes examined for this study, points back to three of the same four initial elements of the conceptual model: Instructor characteristics, student characteristics, and pedagogy. In the counseling series, the instructors used a constructivist, process-based learning method where the primary mode of learning was through collaborative discussion of the concepts introduced in the readings. This pedagogy, strongly consistent with prevailing models of instructional design for adult learners, appeared well matched to the students' expectations for the course and was fully supported through the efforts and modeling of the instructors and through the media employed during the course. In this way, the present findings are consistent with those of Dysthe (2002) and of Smith et al. (2001) who concluded that online media were very capable of supporting constructivist learning approaches. As noted above, the discussions, conducted primarily in MOO and continued in a different way on Blackboard, served not only as the primary vehicle for learning but also as the primary vehicle through which all four of the constructs developed. In the counseling class series, then, learning and growth of the class sense of community walked hand in hand and were both maximized. As the students in the focus group commented, they learned a great deal, grew together as a

group, and had a highly positive experience. One called it, "The best professional development experience I've ever had." In short, then, the present study also serves to support the findings of Swan (2001), Picciano (2002) and others who concluded that high levels of the social interaction construct were strongly related to student satisfaction in online learning. The present study goes beyond those studies, however, in suggesting that the reason for that high level of satisfaction is not solely due to social interaction, but also due to the social presence and sense of community that arise from it.

With respect to the learning experiences in the special ed online sessions, the verdict is mixed. The instructor's intent in the online MOO sessions was primarily to convey information to the students in an efficient and convenient manner. As a result, she minimized discussion and used the slides as a means of conveying information. Whether this approach matched the students' expectations for the MOO sessions is difficult to say based on the available data. Based on the instructor's description of the way she would normally conduct the f2f class sessions, which was quite a bit different from her MOO pedagogy, it is possible that the MOO sessions did not meet the expectations of many of the participants. Nevertheless, some of the students clearly indicated that they liked doing the class in MOO even though they gave no direct indication of their learning. On the other hand, at least two students questioned the value of doing the class that way and one of them cast doubt on her learning in the session. Perhaps most telling with respect to the special ed classes was the statement made by the instructor that she wasn't sure during those classes that her students were "getting it" because she couldn't see their faces. Had the instructor employed pedagogy prompting

for student comments and discussion concerning the slides, she would have been able to see the students responding to the information in the only way that is visible in the MOO: Synchronous exchange of communication. In a very real way, then, her pedagogy did not match her own expectations and thereby resulted in a less than fully successful online learning experience for her, if not for the students.

Attrition and Retention

As for attrition and retention, nobody quit during a class. One student thought about withdrawing due to personal reasons during the first counseling term but did not quit. Based on her own account both in the class and during the focus group session, her election to persist was due, at least in part, to the support she felt and received from her peers in the class. As such, the sense of community that developed among the participants in the counseling series helped to prevent the attrition of at least one student. The attrition that took place in the special ed series, during which seven students were lost to the program, all took place between terms and mostly due to circumstances beyond the classes themselves (one student moved out of state, another's work responsibilities precluded continuing). Hence, the attrition that took place was due to factors other than a sense of isolation, presuming that the special ed instructor's version of events is correct. Whether the avoidance of a sense of isolation in the counseling series contributed to the strong retention and persistence patterns observed among the counseling students is the subject of another study. For now it can suffice to say that the counseling students clearly did develop a strong mutual connection through their primarily online interactions, thereby avoiding the commonly cited sense of isolation, and

that sense of community had a positive influence on learning experiences. All told, it was the degree of matching between media characteristics, student characteristics, instructor characteristics, and pedagogy that yielded the learning experiences observed, both positive and negative.

Limitations of the Study

With respect to limitations of the present study, the most evident and pervasive is the narrow focus of the study. By limiting the data gathering to only four classes and two cadres of students, the study is vulnerable to charges of insignificance due to a lack of transferability of the findings and conclusions. The narrow focus of the study was purposeful, however, and made it possible to give the voluminous data set the thorough examination that the research questions demanded within the time constraints under which this study was conducted. The transferability issue was also addressed through the inclusion of four classes that, while similar enough to warrant comparisons, exhibited numerous differences that, as revealed in this chapter, served to qualify and contextualize the findings, thereby strengthening transferability. Had the four classes been more homogeneous, the transferability of the findings would have been undermined as the impact of pedagogy and instructor involvement may have been less salient. The purpose of this study was to develop an understanding of processes that affect online learning experiences, such that online course designers and online instructors might be able to apply the conclusions toward maximizing participant experiences in their own online classes. A set of suggested strategies resulting from those findings follows this

discussion of limitations. Ultimately, it is up to the reader to decide if the findings are applicable to their own instructional setting and design.

Two other potential limitations of this study addressed elsewhere in this document include the lack of inclusion of direct data from the face-to-face sessions in any of the four subject courses and the absence of the voices of students who did not consent to participate, both of which are potential threats to the credibility of the findings. One additional limitation not addressed previously concerns the lack of response from the class participants with respect to the member checks. Though the researcher shared the initial biases, summary of findings, and resultant conclusions from the study with the study participants via email, few responses were received. This silence from the participants could be indicative of their concurrence with the material submitted as an accurate representation of their class experiences. On the other hand, their silence could indicate that they did not review the materials submitted, thereby devaluing the member checking protocol and the value it adds to the credibility and dependability of the findings. Unfortunately, in the continued absence of participant responses, the researcher must presume that silence confirms concurrence as there is no way to know otherwise. The one factor that balances this concern in small degree is the fact that the researcher shared some of his observations and beginning conclusions with the study participants during the focus group and interview sessions and incorporated their feedback into the evolving findings and conclusions from the study. In large part, those students and instructors who participated in the focus group and interview sessions concurred with the findings and conclusions that were shared at that time.

Summary and Future Directions

This study set out to investigate how the use of an online, virtual environment impacts on online collegiate learning experiences in terms of four constructs: Presence, social presence, social interaction and sense of community. The study sought to fulfill this purpose through an ethnographic examination of the online learning component of four subject classes. Using online transcript analysis from two different online media in addition to focus group and interview data, the researcher conducted an in-depth analysis of all the online sessions from the four subject classes and, from the resulting findings, drew a number of conclusions. First, the use of the virtual environment as a forum for online learning clearly had facilitated presence, social presence and social interaction in ways that the asynchronous forum could not. As such, this study stands in clear support of the views of Kozma (1994), Wegerif (1998), Ellis (2003), Poole (2000) and many others that media can have a substantial impact on online learning experiences. By the same token, the study stands in marked contrast with the work of Clark (1983), Rovai (2002b), and others who have argued that media have no influence on learning or the constructs examined herein. Rather, in line with McLuhan (1964), these findings reinforce the notion that to the extent that the media employed in online learning filter, shape, and transmit information between and among participants, they in effect define that information as it is experienced by users.

Having highlighted the significant potential impact of media in online classes indicated by these findings, it must also be noted that the use of the virtual environment was not a panacea, miraculously creating strong social interaction and online sense of

community by virtue of its own capabilities. Rather, it was only through the blending of the medium's capabilities, the pedagogy enacted in the sessions, the instructor's level of involvement in fostering interaction, and the students' motivation to invest themselves in the online meetings that the constructs examined for this study were maximized. While not a panacea, the findings from this study definitively establish that an online class utilizing a MOO or perhaps another virtual environment that supports rapid-paced, synchronous communication can facilitate presence, social presence, and social interaction in such a way as to foster the development of a strong sense of community among course participants over time. As the juxtaposition of the counseling and special ed classes clearly showed, the use of a certain medium is not enough on its own to foster the kind of social interaction and social presence that breeds sense of community among learners. Using the same online resources in very different ways can make a big difference in how the constructs examined in this study emerge and mutually influence one another. Likewise, this study reinforced the concept already established in the literature that online group identity formation comes in stages and highlighted how that process can happen in a mostly online format over time through intensive, facilitated participant social interaction in the online setting.

In light of the findings and conclusions drawn from this study, the researcher makes the following recommendations to designers and instructors of online class sessions, whether they be isolated online class meetings in a largely f2f context (like special ed) or instead classes taught almost exclusively online:

1. Take care to match the online pedagogy to be employed in the class to an online medium or media that effectively support that pedagogy. For pedagogy centered on intensive discussion, a synchronous forum may be better.

2. Consider the use of multiple online media for conducting the class sessions. Sometimes, the use of a 2nd forum can "fill in the gaps" of information that was not as well addressed in the other.

3. Fully invest yourself in the pedagogy to be used in an online forum, whether that is Blackboard, MOO, or something different. As indicated in the first special ed Blackboard session, instructor modeling of the expected communication patterns can have a strong influence on student communication behavior.

4. No matter the forum, provide ample feedback to student posts. In a synchronous forum, this contributes to social interaction, social presence, and eventually sense of community. In an asynchronous forum, it at least builds receptivity and trust.

5. Place an emphasis on participation online and communicate to students the value of participating, thereby increasing student motivation to participate in the virtual classes.

6. Recognize that no online medium is a panacea and that a successful online class or class session that maximizes student learning experiences is one that properly balances the goals and pedagogy of the class with the media to be employed in the class.

While this study has taken large steps toward shedding light on the processes through which the four constructs manifest themselves in online learning involving a virtual environment, many questions still abound. For instance, if synchronous

communication is the key medium feature supporting presence and social presence, could this same impact be achieved through any synchronous medium like Instant Messenger or a standard IRC chatroom even if that medium had fewer spatial cues than MOO? Likewise, could a synchronous forum without the ability to display slides foster levels of social interaction and social presence comparable to that seen in MOO or does the ability to create a mutual context for discussion through broadcasting slides make as much of a difference as these results indicated. As noted previously, a study to compare the manifestations of presence between a primarily text-based environment, like MOO, and a more graphical environment, like Second Life, with comparable interactive capability would help to address the relative strength with which a text-based medium can promote presence. And finally, the conclusions garnered from this study bear further examination in other settings, such as classes that are fully online with no f2f component whatever, to further determine whether the processes observed in the counseling series classes could be replicated in an exclusively online class. Until then, let it suffice to say that these findings lead the researcher to conclude that online classes designed with a proper match of medium, pedagogy, instructor involvement, and student commitment can, in fact, bridge the distance and quell the isolation that persistently plagues online classes, through supporting the kind of connectedness among students seen in the counseling sessions that could reduce attrition among class participants.

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APPENDIX A. TABLES

Table 1: Spring Term Counseling MOO Session Post Volumes and Frequencies

Session	1	2	3	4	5	6	7	8	10	11	12	TOTAL	AVG	% of posts
Taylor Monroe	47	51	48	46	43	72	55	42	40	0	41	485	48.5	5%
Susan Blake	75	90	0	68	62	91	91	90	61	0	95	723	80.3	9%
Monique Dar	45	59	82	68	65	70	60	68	68	62	63	710	64.5	7%
Cynthia Johnson	56	54	46	36	26	63	54	55	8	24	41	463	42.1	5%
Megan Wright	93	67	48	30	56	52	47	41	48	29	44	555	50.5	6%
Nathan Hardy	46	36	74	50	55	52	35	28	28	43	29	476	43.3	5%
Jill James	106	88	110	108	102	84	113	93	0	113	98	1015	101.5	11%
Tonya Jernigan	40	36	53	42	42	41	41	32	29	37	49	442	40.2	4%
Margaret Smith	27	34	47	30	26	62	62	52	54	52	36	482	43.8	5%
April Shultz	36	46	80	68	49	69	76	49	32	48	38	591	53.7	6%
Edwina Simpson	0	112	88	140	120	95	81	91	62	76	63	928	92.8	10%
Dwight Morrison	116	169	58	145	133	0	0	131	169	96	191	1209	134.3	15%
Anna Felton	0	0	120	94	123	238	200	101	34	101	52	1063	118.1	13%
TOTAL	687	842	854	925	902	989	915	873	633	681	840	9142	831.1	
Transcript Duration (min)	72	104	110	110	120	108		119	94	108	96	1041	104.1	
Transcript Length (pg)	24	31	30	33	31	34	31	29	23	25	28	319	29	
Pace (min/pg)	3.00	3.35	3.67	3.33	3.87	3.18	0.00	4.10	4.09	4.32	3.43	3.26	3.6	
Post freq (posts/min)	9.54	8.10	7.76	8.41	7.52	9.16	0.00	7.34	6.73	6.31	8.75	8.78	8.0	
Post length (posts/pg)	28.63	27.16	28.47	28.03	29.10	29.09	29.52	30.10	27.52	27.24	30.00	28.66	28.7	
Posts per person													63.9	
Posts per student													62.2	
posts/pers/min													0.6	
posts/stu/min													0.6	
posts/instructor/min													1.2	
student posting freq													6.6	

= absent

=data unavailable due to absence of beginning timestamp

=data affected by absence of session 7 duration data

Table 2: Summer Term Counseling MOO Session Post Volumes and Frequencies

Session	1	2	3	4	5	6	7	8	9	**totals**	**avg**	**% of posts**
Taylor Monroe	85	25	62	46	53	33	30	48	33	415	**46.1**	**6.2%**
Susan Blake	131	46	85	89	72	31	49	67	0	570	**71.3**	**9.6%**
Monique Dar	62	25	78	48	48	41	41	48	36	427	**47.4**	**6.4%**
Cynthia Johnson	36	34	89	53	67	26	29	48	40	422	**46.9**	**6.3%**
Megan Wright	24	32	0	35	60	26	19	30	23	249	**31.1**	**4.2%**
Nathan Hardy	53	18	45	27	41	55	39	53	4	335	**37.2**	**5.0%**
Jill James	84	61	103	89	96	0	106	100	71	710	**88.8**	**12.0%**
Tonya Jernigan	49	27	52	41	56	45	35	44	50	399	**44.3**	**6.0%**
Margaret Smith	26	20	23	50	37	28	43	58	32	317	**35.2**	**4.7%**
April Shultz	0	15	42	32	31	36	51	59	32	298	**37.3**	**5.0%**
Edwina Simpson	44	24	55	42	60	31	23	39	22	340	**37.8**	**5.1%**
Dwight Morrison	139	102	198	180	132	132	160	185	115	1343	**149.2**	**20.1%**
Eryn Jordan	75	28	107	134	199	82	0	145	82	852	**106.5**	**14.4%**
Chris Allison		61								61		
Dorapatha Patel							42			42		
TOTAL	808	518	939	866	952	566	667	924	540	6780	**753.3**	
		**										
Transcript Duration	118	67	122	119	110	83	117	118	86	940	**104.4**	
Transcript Length	29	18	33	31	31	20	22	32	18	234	**26.0**	
Pace (min/pg)	4.07	3.72	3.70	3.84	3.55	4.15	5.32	3.69	4.78	4.02	**4.02**	
Post freq (posts/min)	6.85	7.73	7.70	7.28	8.65	6.82	5.70	7.83	6.28	7.21	**7.21**	
Post length (posts/pg)	27.86	28.78	28.45	27.94	30.71	28.30	30.32	28.88	30.00	28.97	**28.97**	
Posts per person	67.33	37.00	78.25	66.62	73.23	47.17	47.64	71.08	45.00	521.54	**57.95**	
Posts per student	59.40	29.73	63.40	50.18	56.45	35.20	42.27	54.00	34.30	416.82	**45.24**	
posts/pers/min	0.57	0.55	0.64	0.56	0.67	0.57	0.41	0.60	0.52	0.55	**0.55**	
posts/stu/min	0.50	0.44	0.52	0.42	0.51	0.42	0.36	0.46	0.40	0.44	**0.43**	
posts/instructor/min	0.91	0.95	1.25	1.32	1.50	1.29	0.86	1.40	1.15	1.22	**1.22**	
student posting freq											**4.76**	

=absent

Table 3: Special Ed MOO Session Post Volumes and Frequencies

Session	Fall	Spring
Henrietta Miles	111	147
Delores Carry	22	25
Sarah DeVray	14	20
Maria Bynum	18	
Pamela Singletary	21	32
Tara Edwards	16	31
Andrea Henry	41	
Terry Hunter	14	10
Laura McCants		9
Rorie Ferguson		50
Nancy Pate		38
Simone Harrington		24
Orla Betts		18
TOTAL	257	404
Transcript Duration	82	104
Transcript Length	11	15
Pace (min/pg)	7.45	6.93
Post freq (posts/min)	3.13	3.88
Post length (posts/pg)	23.36	26.93
Posts per person	32.13	50.50
Posts per student	20.86	36.71
posts/pers/min	0.39	0.49
posts/stu/min	0.25	0.35
posts/instructor/min	1.35	1.41
student posting freq	1.78	3.53

= absent

Table 4: Spring Term Counseling Blackboard Session Post and Reply Volumes and Frequencies

Session	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTALS	Posting %	Mean
Taylor Monroe		1	1	2	2	2	1	1	1	4	3	2		20	10%	1.82
Susan Blake	3	3	2	6	2	2	1	2	1	2	2	1	1	28	13%	1.54
Monique Dar	1	1	2	4	2	3	2	1	2	1	2	2		23	11%	1.92
Cynthia Johnson		1	2	2	2	2	1	1	1	1	1	1		15	7%	1.36
Megan Wright		1	1	1	1	1	1	1	1	1	1	1		11	5%	1.00
Nathan Hardy		2	1	1	1	2	2	1	1	1	2	1		15	7%	1.36
Jill James	1	3	4	2	5	5	2	1	2	2	2	2	1	32	15%	1.15
Tonya Jernigan		3	2	2	1	1	3	1	1	1	2	1	1	19	9%	1.58
Margaret Smith	1	1	5	2	1	1	2	1	1	1	1	2		19	9%	1.58
April Shultz		1	1	1	1	2		1	2	1	1	1		12	6%	1.09
Edwina Simpson		1	1	1	2	2	1	1	1	1	1	1		13	6%	1.18
Dwight Morrison		2												2	1%	
Anna Felton														0	0%	
TOTAL	6	20	22	24	20	23	16	12	14	16	18	15	3	209		16.08

Replies

Session	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTALS	Posting %	Mean
Taylor Monroe				1	1	1	1			3	2	1		10	16%	0.77
Susan Blake	1	1	1	4	1		1	1		1	1			12	19%	0.92
Monique Dar			1	2	1	1	2		1		1	1		10	16%	0.77
Cynthia Johnson				1	1		1							3	5%	0.23
Megan Wright		1		1			1							3	5%	0.23
Nathan Hardy											1			1	2%	0.08
Jill James	1		2	1	2	3							1	10	16%	0.77
Tonya Jernigan							2				1			3	5%	0.23
Margaret Smith			2	1			1		1			1		6	10%	0.46
April Shultz						1			1					2	3%	0.15
Edwina Simpson					1		1							2	3%	0.15
Dwight Morrison														0	0%	0.00
Anna Felton														0	0%	0.00
TOTAL	2	2	6	11	7	6	10	1	3	4	6	3	1	62		4.77

Number of posts With at least one reply	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
Initial posts	3	17	16	11	13	17	5	11	12	12	12	13	3	145
initial posts w/reply	3	4	4	6	4	5	3	1	1	3	3	2	1	40
Percentage w/reply	100	24	25	55	31	29	60	9	8	25	25	15	33	28

Table 5: Summer Term Counseling Blackboard Session Post and Reply Volumes and Frequencies

Session	1	2	3	4	5	6	7	8	TOTALS	Posting %	Mean
Taylor Monroe	2	3	1	3	3	1	1	1	15	11%	1.88
Susan Blake		1	1	4	4		1		11	8%	1.57
Monique Dar	2	3	2	4	3	1	2	2	19	14%	2.38
Cynthia Johnson	1	3	1	1	1		2	1	10	7%	1.43
Megan Wright	1	1		1	2		1	2	8	6%	1.14
Nathan Hardy	2	1	1	4	2	1	3	2	16	12%	2.00
Jill James	1	1	2	2	3		1	3	13	10%	1.86
Tonya Jernigan	4	2	1	2	1	1	1	1	13	10%	1.63
Margaret Smith	3	2	1	4	1		1	1	13	10%	1.86
April Shultz	2	1	1	1	1		2	1	9	7%	1.29
Edwina Simpson	1	1	1	1	1		1	1	7	5%	1.00
Dwight Morrison									0	0%	
Eryn Jordan									0	0%	
TOTAL	19	19	12	27	22	4	16	15	134		16.75

Replies

Session	1	2	3	4	5	6	7	8	TOTALS	Posting %	Mean
Taylor Monroe	2	2		2	2	1			9	17%	1.13
Susan Blake				3	3				6	12%	0.75
Monique Dar	1	2	1	3	2			1	10	19%	1.25
Cynthia Johnson		2							2	4%	0.25
Megan Wright		1			1			1	3	6%	0.38
Nathan Hardy				3	1	1	1		6	12%	0.75
Jill James			1	1	2				4	8%	0.50
Tonya Jernigan	3	1		1					5	10%	0.63
Margaret Smith	2	1		3					6	12%	0.75
April Shultz							1		1	2%	0.13
Edwina Simpson									0	0%	0.00
Dwight Morrison									0	0%	0.00
Eryn Jordan									0	0%	0.00
TOTAL	8	9	2	16	11	2	2	2	52		6.50

Number of posts With at least one reply	1	2	3	4	5	6	7	8	TOTAL
Initial posts	10	10	10	11	11	2	14	13	81
initial posts w/reply	6	4	0	3	7	2	2	3	27
Percentage w/reply	60	40	0	27	64	100	14	23	33

Table 6: Fall Term Special Ed Blackboard Session Post and Reply Volumes and Frequencies

Session	1	2	3	4	TOTAL	Percentage	Mean
Henrietta Miles	1				1	0.01	0.25
Delores Carry	1	3	3	3	10	0.12	2.50
Sarah DeVray	1	1	3	3	8	0.10	2.00
Maria Bynum	1	3	3	2	9	0.11	2.25
Pamela Singletary	1	4	3	6	14	0.17	3.50
Tara Edwards	1	4			5	0.06	2.50
Andrea Henry	1		3		4	0.05	2.00
Terry Hunter	1	1	3	3	8	0.10	2.00
Laura McCants	1	1		3	5	0.06	1.67
Simone Harrington	1	3	3	3	10	0.12	2.50
Orla Betts	1	3	3	3	10	0.12	2.50
TOTAL	11	23	24	26	84		21.00

Replies							
Session	1	2	3	4	TOTAL	Percentage	Mean
Henrietta Miles					0	0%	0
Delores Carry		2		2	4	9%	1
Sarah DeVray			2	2	4	9%	1
Maria Bynum		2	2	2	6	14%	1.5
Pamela Singletary		2	2	3	7	16%	1.75
Tara Edwards		2			2	5%	1
Andrea Henry			2		2	5%	1
Terry Hunter			2	2	4	9%	1
Laura McCants				2	2	5%	0.67
Simone Harrington		2	2	2	6	14%	1.5
Orla Betts		2	2	2	6	14%	1.5
TOTAL	0	12	14	17	43		10.75

Number of posts						
With at least one						
reply	1	2	3	4	TOTAL	Last three
Initial posts	11	9	8	8	36	25
initial posts w/reply	0	4	6	6	16	16
Percentage w/reply	0	44	75	75	44	64

Table 7: Spring Term Special Ed Blackboard Session Post and Reply Volumes and Frequencies

Session	1	2	3	TOTAL	Percentage	Mean
Henrietta Miles				0	0%	0
Delores Carry	3	3	3	9	12%	3.00
Sarah DeVray	3	4	3	10	13%	3.33
Maria Bynum	3	3	3	9	12%	3.00
Pamela Singletary	3	3	3	9	12%	3.00
Tara Edwards	2			2	3%	0.67
Nancy Pate	3	3	3	9	12%	3.00
Terry Hunter	3			3	4%	1.00
Laura McCants	3	4	3	10	13%	3.33
Simone Harrington	3	3	1	7	9%	2.33
Orla Betts	2	3	3	8	11%	2.67
Rorie Ferguson	3	4	4	11	14%	3.67
Danner_Stone	2		3	5	7%	1.67
TOTAL	28	30	22	76		25.33

Replies						
Session	1	2	3	TOTAL	Percentage	Mean
Henrietta Miles				0	0%	0
Delores Carry	2	2	2	6	12%	2.00
Sarah DeVray	2	3	2	7	14%	2.33
Maria Bynum	2	2	2	6	12%	2.00
Pamela Singletary	2	2	2	6	12%	2.00
Tara Edwards	2			2	4%	0.67
Nancy Pate	2	2	2	6	12%	2.00
Terry Hunter	2			2	4%	0.67
Laura McCants	2	3	2	7	14%	2.33
Simone Harrington	2	2		4	8%	1.33
Orla Betts	1	2	2	5	10%	1.67
Rorie Ferguson	2	3	3	8	16%	2.67
Danner_Stone	2		2	4	8%	1.33
TOTAL	19	21	14	51		17

Number of posts With at least one reply	1	2	3	TOTAL
Initial posts	10	9	10	29
initial posts w/reply	8	9	8	25
Percentage w/reply	80	100	80	86

APPENDIX B: INTERVIEW PROTOCOL

Initial Contextual Information

How comfortable are you with using computers?

How much experience have you had with taking classes online?

Have you ever used a system like the MOO before? What kind of system was it?

How familiar were you with the instructor and the other class participants before taking this class?

Social Presence

Social Context (user perceptions of the environment, itself)

How did the use of the MOO affect student-teacher communication during the class? Student-student communication?

What kind of tone did the MOO set for class communication and how was this tone set?

Was it your perception that the MOO environment was a comfortable or uncomfortable means of communication, and why?

Describe what it was like for you to communicate with others in the MOO.

What were some of the challenges of doing class in the MOO?

What were some of the benefits of doing class in the MOO?

How did your experience of communicating and doing class in the MOO compare with that of Blackboard?

Online Communication (user perceptions of the language used online)

How would you describe the language you and your classmates and instructor used in the MOO class sessions?

What kinds of messages were conveyed to you through the MOO communication? Were some messages conveyed better than others and if so, which ones?

How well did the language used in the MOO convey feeling and sentiment? Were some feelings conveyed better than others, and if so, which ones and why?

How well did the language used in the MOO convey "nonverbal" meanings? Why?

How well were you able to understand what your classmates were trying to say in the MOO?

Was there any difference in the kinds of language used in the MOO and that used in Blackboard? If so, what?

Interactivity (activities and communication styles employed by users)

Were the class activities and communication conducted in the MOO pleasant? Why or why not?

How would you describe the feedback you received from the other class participants and the instructor during the MOO sessions?

Sense of Community

How did your relationship with your instructor and classmates change over the course of the class?

What is your relationship with your instructor and classmates like now (or what was it like at the end of the class)?

How comfortable were you and your classmates with asking questions, both of one another and of the instructor? What prompted your comfort or lack thereof?

How would you describe the manner in which your questions were addressed and/or the feedback you received from others in the class?

How connected to or isolated from the instructor and other students did you feel during in the course, and why?

To what extent did you feel you could trust or rely on the other class participants, and to what extent do you think that they felt they could depend on you and why (or why not)?

How would you describe your learning in this course? Did and your fellow students play a role in helping one another learn, and if so, what was that role?

To what extent were your educational needs met in this course and were you given enough opportunities to learn?

How did the course promote (or fail to promote) a desire to learn among students?

Was there any difference in the sense you got about your classmates during your Blackboard interactions when compared with during the MOO sessions? If so, what?

Social Interaction

Would you say that it was easy to communicate with other course participants in the MOO? Why or why not?

Were you able to get a good impression of your classmates through your MOO sessions? Why or why not?

To what extent did the MOO allow you and other course participants to work together collaboratively, and how did that go? What was your role on the team?

What proportion of the interactions in the MOO were task oriented and what proportion served other purposes? What were some of the "non-task oriented" communications?

Were you able to make friendships through the MOO interactions? If so, how did these develop? If not, why not?

Presence

To what extent did you feel that you could control the MOO environment, and how well did it respond to your commands? How did you feel when interacting with the environment itself? How confident and proficient did you feel in using it?

When doing class sessions in the MOO, how much was your attention focused on the MOO as opposed to the real world around you?

When participating in MOO class, how aware of the computer, keyboard and mouse were you as opposed to what was happening on the screen?

Did the classes seem to take about as long as you expected or did they drag or fly by, instead?

Did you create or manipulate objects in the MOO (like a room) and (if so) what was that like?

When you were performing tasks in the MOO (like moving around or “talking”) how cognizant were you of the technical steps you were taking to perform those actions (clicking on icons and clicking “say”) as opposed to them just happening naturally?

APPENDIX C: ANALYSIS PROTOCOL

Social Presence

Language indicating a perception of the presence of others consistent with the conceptual definition.

Social Context (user perceptions)

Social or relational language as described under Social Interaction below which indicates student perceptions of the class setting as a social, personal, and sensitive communication forum

Informal and casual language by participants such as colloquialisms, slang, humor, indicating that participants perceive the class setting as an informal or casual forum.

Use of first names and nicknames by participants in messages addressed to others, use of informal language, humor, indicating a comfort in communicating with others and a familiarity with others.

Online Communication

Language and symbols that convey states of emotion such as "emoticons."

Language conveying understanding or a lack thereof, such as clarifying questions.

Interactivity (activities)

Language indicating that participants are enjoying their experiences and finding the session pleasant

The degree of responsiveness and immediacy of the interaction as measured by how often student inquiries receive a response and by the amount of intervening material between inquiry/comment and response.

Sense of Community

Language indicating concern for one another or interest in one another.

Language from participants that encourages questions

Indices of participants providing help and assistance to one another, and a lack thereof.

Indices of timely feedback as described above.

Language through which students identify gaps in their understanding

The degree to which all students participate in the class discussion and activities.

Language of receptivity and trust as indicated below.

Expressions that indicate participants are gaining an understanding of the material and are learning.

Indices of participants requesting assistance of one another and receiving that assistance suggesting that participants can rely on one another.

Language from students indicating an interest in learning, such as clarifying questions.

Social Interaction

Language that conveys **immediacy and affection**, which includes language of inclusion, involvement, and warmth toward others such as greetings, personal inquiries, and expressions of emotion.

Language that conveys **similarity and depth**, which serves to deepen relationships through self-disclosure.

Language that conveys **composure**, a sense of calm as opposed to tension.

Language that communicates **dominance** of one party over another or the reverse, a sense of **equality** among parties.

Language that establishes a sense of **formality** or the reverse, a **casual** informal tone.

Language that conveys **receptivity and trust**, including language conveying a sense of rapport, openness to the ideas of others, and an interest in what others have to say.

Presence

Language of intent followed by corresponding successful action, suggesting students can control the environment and that it is responsive to their actions.

Indications of real-world distractions or language suggesting that students are engaged in activities other than the class.

Indications of technical issues suggesting that the equipment is impacting on the experience of the class environment

Language indicating that students are able to anticipate what will happen in response to actions they perform

Indications of participants examining, moving, and/or otherwise manipulating objects in the environment

There amount of delay between an action and the expected outcome in the environment as indicated by intervening events

Indications that students are losing track of time in class sessions

APPENDIX D: INITIAL CONCEPTUAL MODEL