AN INVESTIGATION OF SOCIAL PRESENCE IN POSTSECONDARY LEARNERS
ENROLLED IN ONLINE LEARNING ENVIRONMENT

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This dissertation titled

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ENROLLED IN ONLINE LEARNING ENVIRONMENT

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Abstract

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AN INVESTIGATION OF SOCIAL PRESENCE IN POSTSECONDARY LEARNERS ENROLLED IN ONLINE LEARNING ENVIRONMENT (201 pp.)

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This study examined the perceived social presence of postsecondary learners enrolled in online learning environment. More specifically, the study investigated whether facilitation, affective responses, involvement, course design, community size, age, and gender significantly predicted perceived social presence in postsecondary learners enrolled in online learning environments. The study also sought to investigate the relative importance of predictor(s) facilitation, affective responses, involvement, course design, community size, age, and gender in accounting for social presence in online learning environment.

The data were collected from 900 students randomly selected from a list of 1,857 students enrolled in online learning in the spring and summer quarters of the 2005/2006 academic year in a Midwestern university. A total of 218 of the 900 students sampled responded to the online questionnaire. This represented a response rate of 24.2%.

The findings of this study showed that there was a strong positive relationship between perceived social presence, the dependent variable and the predictor variables involvement, facilitation, affective responses, community size, course design, gender, and age when combined, \( R = 0.834, R^2 = 0.695, \text{Adjusted } R^2 = 0.685, F (7, 210) = 68.379, P = 0.000 \). Independently, community size, gender, and age did not significantly predict perceived social presence in postsecondary learners enrolled in online learning in this
study. Involvement, affective responses, facilitation, and course design were crucial factors that predicted and enhanced perceived social presence in postsecondary learners investigated in the study.

In evaluating the importance of significant predictors, affective response had the highest contribution and/or importance followed by facilitation, and involvement, respectively in accounting for perceived social presence in postsecondary learners enrolled in online learning in this study. Interestingly, in the context of other significant predictors, course design is robbed of its predictive power. In other words, course design impacts social presence through other predictors, namely, affective response, involvement, and facilitation in the case of the present study.

From the findings of the study, we might conclude that affective response, facilitation, involvement, and course design are factors that seemed important for postsecondary learners in this study who wished to relate, connect, share ideas and information, speak with one another, and establish relationships despite the physical separation. It can be interpreted to mean that what is needed and important for students to feel as part of the group or team online is how the students are involved, how the online class is facilitated, how the online class/course is designed, and the pleasant, supportive, and personable exchanges among students and among students and instructors.

Approved: _____________________________________________________________

Teresa Jean Franklin
Associate Professor, Educational Studies
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What a great moment to triumphantly shout “Ebenezer”-- this far the Lord has brought me, as I cross the finish line of a great academic marathon that started in Kaptalelio, a tiny school on the slopes of Mt. Elgon in Kenya in the 1980s. As I cheerily reflect on my academic adventures, nothing hits me more soberly than the saying of my great people: “It takes the entire village to rear a child.” True to their words, this dissertation would not have been brought to meticulous completion without the diverse contributions of great women and men who were always willing to lend me their ears, thoughts, and, more importantly, constructive criticism.

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CHAPTER ONE: Introduction

Background of the Study

The large increase in the use of information and communication technology continues to transform society. It has radically transformed the way people work, learn, communicate, and relate to each other. With the advent and rapid diffusion of the Internet, the ever-falling costs of technology accessories (Moore’s law), and the rolling out of new technologies within short time intervals as result of business firms competing to outdo each other or holding onto their market niche and share, there are no indications the trend is slowing. Technology is becoming ubiquitous (Castells, 2001; Tapscott, 1998) within every echelon of society, even in places where a decade ago it would have been impossible to have technology due to prohibitive costs. The current tremendous technological evolution may be comparable to what society experienced during the industrial revolution.

The rapid diffusion of disruptive information and communication technology (Christensen, 1997) in what is touted as the “information/knowledge era” has not spared institutions and centers of learning (Archer, Garrison, & Anderson, 1999). Many current changes in the academic enterprise, right from kindergarten to higher education, with, among others, ultramodern telecommunication equipments, are generated and shaped by technology. The delivery of teaching and learning at a distance or online through the World Wide Web, one of the many products of technological advancements, is proliferating at a spectacular speed and is increasingly becoming a staple of the educational system (Wagner, 2001). The amount of money spent by U.S. companies on Information Technology-based delivery of training grew from $3 billion in 1999 to $11
billion in 2003 (Koprowski, 2000). Setzer and Lewis (2005) report that during the 2002-2003 school year, about one-third of public school districts, which represented 5,500 out of a total of 15,040 public school districts, had students enrolled in distance education courses.

Universities and colleges continue to see extensive increase in online or web-based course offerings tailored to meet the needs of diverse audiences, such as working adults who would otherwise have limited access to further their studies (Haugen, LaBarre, & Melrose, 2001; Liaw & Huang, 2002; McEwan, 2001). A study conducted by the National Center of Education Statistics (NCES) in 2003, notes that 1,680 of the two-year and four-year higher institutions in the United States offered distance education courses in 1998 with approximately 1.6 million enrollees.

The study concludes that distance education appears to have become a common feature of many postsecondary education institutions and that by their own account it will become only more common in the future. The growth of distance education is further highlighted by the 2000 edition of *Peterson’s Guide to Distance Learning Programs*. The guide reported that 900 accredited institutions offered 1,000 degrees and certificate programs online (Kenny, 2000). Meyen, Aust, Gauch, Hinton, and Isaacson (2002) suggest that online offerings will continue to increase significantly in educational as well as corporate settings in years to come.

In the midst of this changing trend in learning, teaching, and technological advancement, mixed results are reported. On the one hand, a significant breakthrough is being witnessed in the emergence and rapid rise of new ways of teaching and learning. This is in response to curricular and organizational changes demanding new ways of
delivering education to individual by colleges, universities, and other institutions (Moonen & Collins, 2002). The rising recognition of virtual learning environments across the globe via the World Wide Web, as already mentioned in institutions of learning, is living testimony (Moonen & Collins, 2002). Institutions of higher learning are experimenting with and adopting novel ways of teaching and learning. The induction of the new learning methods has given “birth” to what may be termed as a trilogy of learning, where programs are delivered through three different methods.

First, some programs are offered through the traditional face-to-face method, where there is physical interaction between instructors and learners and among learners themselves in a classroom setting. Second, courses are offered purely online so that students and instructors are physically separated from each other and technology, such as the Internet and web tools, are utilized to bridge physical and transactional distances. In other words there is no face-to-face interaction among the instructors and learners or among the learners themselves. The third strategy in use is the blended or hybrid method. In this method, programs and courses are offered through a combination of both traditional face-to-face and online/distance learning. In essence, the spread of technology has provided increased educational opportunities through access to a wide range of courses, as well as professional development services, and opened doors to the physically challenged. It has enabled learners to learn through methods that meet their individual preferences and needs (Swan, 2002; Swan & Shih, 2005).

In spite of the great promises of technology, institutions of learning are also contending with, negotiating with, and adapting to myriad challenges encountered in embracing the disruptive technologies (Archer et al., 2001; Christensen, 1997). The
challenges may well be broadly classified into situational, epistemological, philosophical, psychological, pedagogical, technical, social and/or cultural (Espinoza et al., 1996; Kaye & Rumble, 1991; Lewis & Romiszowski, 1996; Sherritt, 1992; Shklanaka, 1990; Spodick, 1996).

The challenges have a significant bearing not only on how online learning is structured and delivered but also on the learners’ feelings of “being there” and “being together” in a technology-mediated learning environment. The feeling of “being there” and “being together” is commonly associated with the notion of social presence, an essential ingredient for effective learning in both face-to-face and online learning environments because it provides a conducive environment for collaboration among learners (Swan, 2001). Social presence, the focus of this study, dictates and informs to a larger extent the learning process and strategies to be summoned (Swan, 2001; Swan & Shih, 2005).

The notion of presence is a complicated issue (Tu, 2002a) that cuts across diverse disciplines ranging from psychology, communication, education, cognitive science, computer science, engineering, philosophy, and the arts. In spite of its centrality and importance, presence has not been thoroughly explicated, operationalized, and studied (Lombard & Ditton, 1997). The work that has been accomplished so far is disjointed and unsystematic. This could be attributed partially to the fact that the people interested in presence come from many diverse academic fields (Lombard & Ditton, 1997). The case is complex in an online and/or distance learning environment where social presence has not been deeply explored despite the significant rise in technology-mediated learning (Tu, 2002a).
Citing seminal studies on presence (Champness, 1972; Garramone, Harris, & Anderson, 1986; Short, Williams, & Christie, 1976), Tu (2002a) affirms that most studies have been conducted in noneducational settings, and are difficult to apply to learning environments with certainty, especially in the area of distance learning. Even in disciplines that have carried out detailed studies of presence there are issues that remain thorny and contestable. At best, social presence is a construct still evolving and yet to stabilize (Tu, 2000a). Social presence is usually judged by subjective interpretations of individuals (Lessiter, Keogh, & Davidoff, 2001; Lombard & Ditton, 1997).

Studies acknowledge that several important issues about presence remain unresolved (Biocca, Harms, & Burgoon, 2003; Lombard & Ditton, 1997; Russo & Benson, 2005). Some of the unsettled issues concerning presence include the definition of presence, the methods of measuring presence, the identification of factors that generate or obliterate presence, and the relation of presence to task performance (Lombard & Ditton, 1997).

With the phenomenal rise in online learning, fueled and propelled in part by the internet technology and the accompanying social interaction among and between people, there is urgent need for a deep and detailed theory and better understanding of learners’ behavior in mediated environments (Gunawardena & McIsaac, 2003; Swan, 2001). Tu and McIsaac (2002) note that the understandings of learners’ behaviors in computer-mediated communication provides pertinent information to educators and other stakeholders on how best to manage and design such learning environments to ensure effective learning.
Technology-mediated learning has gained currency, increasingly becoming a staple of many educational institutions trying to reach out to new nontraditional learners and/or those determined to diversify their teaching, training, and learning to meet the ever-evolving demands of student learning in the 21st century (Woods & Ebersole, 2003). Because of the latest surge in online learning and the accompanying pressure to keep up, there has been a haphazard transfer of learning materials directly from the traditional face-to-face learning environment to an online/web-based environment without serious consideration and examination of factors that encourage, sustain, and enhance students’ learning and satisfaction in an online learning environment (Tu, 2002b).

Koohang and Durante (2003) propose that developers and deliverers of online learning need more understanding of how students perceive and react to different elements of online learning and need to know how to apply these elements more effectively to enhance learning. Smart and Cappel (2006) add that the perception and attitude of students to different elements of online learning are critical motivators to their learning. It is therefore imperative to expend intensive effort and interest in studying the pedagogical aspects of online learning and what could make such learning experiences more appealing, sociable, and satisfying to learners.

Numerous studies on technology-mediated learning have been conducted (Freeman & Capper, 1999; Hiltz, 1997; Hoffman, 1999; Maki, Patterson, & Whittaker, 2000; Shea, Fredericksen, Pickett, Pelz, & Swan, 2001). The bulk of these studies have been comparative in nature, comparing traditional learning and computer-based or technology-mediated learning. These studies have yielded what has been commonly

**Statement of the Problem**
referred to as the “no statistical significance phenomenon,” hence, less input for improving practice. For this reason, several researchers (Arbaugh, 2000; Gunawardena & McIsaac, 2003; Phipps & Merisotis, 1999; Russell, 1999; Surry & Ensminger, 2001) have called for a move away from comparative studies and, instead, stressed that we must delve more deeply into understanding the pertinent components of instructional techniques and their impact on students’ learning and satisfaction in the distance/online learning environment.

Some critical issues that beg urgent examination include social presence, delivery and access, control, interaction, human-machine interface, symbolic characteristics, and online instructional theories (Gunawardena & McIsaac, 2003). This study is an endeavor to move a way from media comparative studies. The study seeks to probe social presence, factors responsible for its perception in learners, and how the factors could be integrated into the design and development of effective instruction in online learning environments.

Systematic research on social presence and its impact in educational settings is at best disjointed, with glaring gaps that require investigation. According to Lombard & Ditton (1997) little is understood about the characteristics and behavior of medium users that encourage a sense of presence and the effects of presence once it is evoked. Richardson and Swan (2003) suggest further research to determine the extent to which perceptions of social presence influence student satisfaction, student motivation, and other attitudinal factors as well as students’ actual cognitive and affective learning. A better grasp by both educators and learning institutions of what encourages and discourages social presence in users, its conceptualization, and effects in online learning is not only timely but much needed.
Tu (2002a) decries the inadequacy of the current instruments used to measure what he terms as the complicated issue of online presence. Most studies over the years have adopted the four-item measures proposed by Short, Williams, & Christie (1976) to measure presence: personal-impersonal, sensitive-insensitive, warm-cold, social-unsocial. Tu (2002a) indicates that the notion of social presence in computer-mediated communication extends beyond the four items. Thus, the four-item measure does not capture the complete picture of social presence in technology-mediated learning environment. There are numerous variables of social presence beyond the four items (such as affective responses, interactive indicators, cohesive indicators, facilitation, community size, and course design) cited in the current literature (Aragon, 2003; Rourke, Anderson, Garrison, & Archer, 2001; Swan, 2002).

The loss of face-to-face interaction and the associated cues among learners to learners and learners to instructors as they are physically separated from each other presents different dynamics in teaching and learning in an online learning environment compared with the traditional face-to-face learning environment. The physical separation sometimes has a tendency to reduce the sense of community among learners, resulting in feelings of disconnection, isolation, distraction, and lack of personal attention. Woodley, De Lange, and Tanewski (2001) argue that the level of satisfaction and the degree of persistence in college programs increases when learners feel involved and develop relationships among members of the learning community.

The learning community aids an interactive group process in which learners actively construct knowledge and build upon the knowledge learned through the exchange of ideas with peers and other people (Vygotsky, 1978) making learning richer
and rewarding. In the learning community or community of inquiry, members also experience a sense of psychological comfort, arising from the feeling of immediate support by those around them in case of any difficulties. The notion of presence among learners is one of the key engines that drives and sustains the learning community (Tu & McIsaac, 2002). Tu and McIsaac suggest the need for a deeper examination of how social presence could be enhanced and applied to the online learning environment to make learning communities, teaching, and training more effective.

It is against the highlighted background that this study sought to probe disjointed studies on presence, factors claimed to be responsible for perceived social presence in online learning, and how best to integrate factors responsible for perceived social presence in the design and development of effective instruction in online learning environments. The study achieved this by specifically addressing the following issues:

1. The relationship between factors thought to be responsible for social presence (affective responses, facilitation, involvement, gender, age, community size, and course design) and perceived social presence of postsecondary learners enrolled in online learning environments
2. The relative importance of factors (affective responses, facilitation, involvement, gender, age, community size, and course design) in explaining perceived social presence amongst postsecondary learners enrolled in online learning environments

Significance of the Study

Sadly, a huge number of online learning instructions are designed and reproduced without putting into serious consideration the learners’ social environment (Aragon,
2003). In extreme instances, instructions have been transferred from face-to-face to online environment without any significant adjustment, yet these are two different learning environments (Dhanarajan, 2001; Ellis, 2000; Tu, 2002b). While it is possible to apply learning technologies in a variety of ways in distance education, it is vital to be aware of multiple factors that come into play, for instance, the perception of social presence among learners and how this may impact learning. This study is timely because it endeavors to expound the understanding of social presence, how to generate it, how to sustain it, and the value learners attach to different factors of social presence. The understanding of these aspects is central and critical in the online learning enterprise. Aragon (2003) underscores this need and notes that “the challenge in online learning environments is facilitating some degree of interpersonal contact with the instructor and other participants” (p. 59).

The findings of this study may further underscore (Bibeau, 2001; Vygotsky, 1978) observations that teaching and learning are inherently social endeavors; hence, it is helpful to understand the various effects of the geographic, temporal, and psychological distance between the instructors and participants. Aragon (2003) notes that social presence theory is the lens through which these distances are examined. Educators, policymakers, and hardware and software producers will benefit from the study in their attempt to create meaningful and engaging learning resources and environments.

There is pressing need to devise means, ways, and theory that takes into account students’ personal constructions of social presence or meaning in order to sustain and enhance a sense of community and collegiality in computer-mediated learning. The computer-mediated learning environment has been cited as notoriously devoid of social
cues (Friedman & Currall, 2003). The lack of face-to-face communication and its accompanying cues in an online learning environment may widen the transactional distance among learners and instructors. Tinto (1993) underscored the importance of a community of learners and postulated that learners would increase their levels of satisfaction and likelihood of persisting in a college program if they feel involved and develop relationships with others in the learning community. By fleshing out the predictors of social presence, the study will address the concerns raised that a significant number of researchers on computer-mediated communication have failed to account for the different social processes, settings, and purposes within computer-mediated communication where learners have to base attributions about others on the content and linguistic features of the words used (Ramirez, Walther, Burgoon, & Sunnafrank, 2002).

As more and more colleges turn to online learning as a way of improving revenue streams and expanding educational opportunities, it is important that these institutions of learning understand variables that enhance or hinder the perceived success of online instruction and learning. Social presence is one variable among many that contributes to building a sense of community among learners in online learning (Aragon, 2003). Rovai (2001) suggests that apart from student-instructor ratio, transactional distance, instructor immediacy, lurking, social equity, collaborative learning, group facilitation, and self-directed learning, social presence has a great impact on the sense of community within online learning environments. The understanding of social presence and how it impacts or is impacted by these factors would aid in aligning learning environments to learners’ needs allowing for effective teaching and learning (Swan & Shih, 2005).
According to Biocca, Harms, & Burgoon (2004) there is need for a detailed theory of social presence not only to understand the role of presence in human-to-human and human-computer interaction but also to bring to light critical underlying factors necessary to experience social presence. It is still unclear as to which factors when present for sure, will promote social presence amongst learners enrolled in online learning environments. Richardson and Swan (2003) suggest that when factors, which constitute positive social presence are established, institutions, and instructors could incorporate them into their courses to enrich online learning environments. This could be achieved through training and professional development of instructors in strategies that equip them to cast favorable social presence responses (Richardson & Swan, 2003).

Research Questions

This study sought to answer the following questions considered pertinent for effective learning and teaching in online learning environments:

Q1. Do affective responses, facilitation, involvement, gender, age, community size, and course design predict social presence in an online learning environment? In other words, is there a significant relationship between affective responses, facilitation, involvement, gender, age, community size, and course design with perceived social presence of postsecondary learners enrolled in online learning?

Q2. Which of the predictors (affective responses, facilitation, involvement, gender, age, community size, and course design) are more important in predicting perceived social presence of postsecondary learners enrolled in online learning?
Theoretical Framework

This study was guided mainly by transactional distance theory proposed by Moore (1973) and Goffman’s (1967) face theory.

Transactional Distance Theory

According to Moore’s transactional distance theory, distance is defined as a psychological and communication gap that is a function of the relationship between structure, dialogue, and autonomy. Structure is associated with elements of the course design, such as assignments, scheduled interactions, learning objectives, and evaluation. Dialogue refers to communication between the learners and instructors whereas autonomy is the characteristic of the learners who control and manage their learning independently (Moore, 1980; Moore & Kearsley, 1996).

Transactional distance theory posits that high levels of dialogue and less predetermined structures allow learners more flexibility. This is so because learners are able to modify instructional materials to meet their needs as they receive ongoing guidance from facilitators. In the process, transactional distance is lessened (Moore & Kearsley, 1996). Along the same line of argument, high structure and low dialogue results in greater transactional distance, which places more responsibility on the part of the learner to be autonomous in order to succeed (Moore & Kearsley, 1996).

According to transactional distance theory, success in online and or distance teaching hinges upon the degree to which facilitators/instructors and institutions of learning are competent to offer appropriate structure and suitable quantity and quality of dialogue among instructors and learners, while taking into consideration learners characteristics (Moore & Kearsley, 1996).
Face Theory

Face theory is broadly associated with the linkage of the use of language to define social roles and exchange relationships (Brown & Levinson, 1987; Goffman, 1967). This is important in online learning because how instructors and/or learners express their views provides important information about their intentions and how they perceive each other.

According to face theory, parties in communication have two choices, either to give face or attack face. By face “giving” or face “attacking,” Goffman (1967) meant that what parties say and do that can be interpreted as either building up or undermining the other party’s perceived sense of respect. These communications are known as “giving” and “attacking” face. The choice of words or language that protects the other person’s character and is intended to preserve the relationship gives or builds face. On the contrary, words or language that implies the other partner or party is unremorseful, arrogant, uncooperative, or untrustworthy attacks the face by indicating that the speaker is willing to risk loss of a relationship (Brett, Olekalns, Friedman, Goates, Anderson, & Lisco, 2007).

Tjosvold and Sun (2000) note that the giving or attacking of face is not directly measurable; rather, it is implied through individuals’ choices of words and the message that those words convey when received and decoded by the receiver. Communications that give face also provide information about the relationship between the speaker and recipient. They may establish verbal immediacy, an ingredient necessary for reducing social distance and fostering positive relationship (Brett et al., 2007). Words, whether written or spoken, that give face to the other would stimulate openness to new ideas and
further discussion. When people feel that their “face” is under attack, they are more likely
to withdraw completely from further discussion or respond in ways that are defensive and
uncooperative.

Face theory provides a critical lens through which the relationship among online
learners and their perceived social presence is understood. The researcher proposes that
the choice of words used by online learners provides a great deal of information about
their perception of online learning, colleagues, instructors, preferences, and the likelihood
that the learners experience social presence. The likelihood that learners will experience
social presence in online learning hinges on whether they perceive their colleagues, as
well as facilitators, as giving them face and vice versa. When online learners feel that
their faces are preserved rather than attacked, the transactional distance is reduced
because open dialogue ensues and/or is easily enhanced.

To understand more about how the choice of words used and how they can affect
online learning environment, the work of Pennebaker, Francis, and Booth (2001) on the
usage of words as markers of emotional states, social identity, and cognitive style, among
others, can be consulted (Brett et al., 2007; Pennebaker, Mehl, & Niederhoffer, 2003).
Pennebaker et al. (2001) developed the Linguistic Inquiry and Word Count (LIWC), in
which 2,300 words were categorized into broad groups, some of which represent
affective or emotional, cognitive, social, and sensory and perceptual processes.

Definition of Terms

Online learning - is delivery of learning through the use of information
communication technology via the Internet where learners and instructors are physically
separated.
Social presence - in the context of this study is conceptualized to mean how participants in online learning environments relate, connect, share ideas and information, speak with one another, and establish relationships (through an agreed-upon means), despite the physical separation, to create a feeling of togetherness or intimacy.

Gender – is the biological gender of the student surveyed.

Age – is self reported number of years lived.

Student satisfaction - is defined as a favorable or positive attitude toward the learning experience in a distance-learning course (Arbaugh, 2000).

Affective responses/indicators - are personal expressions of emotions, feelings, beliefs, and values. It is a way of projecting personal immediacy or social presence into online discourse as ways of making up for the lack of gestures, facial expressions, and/or intonation in face-to-face communication (Rourke et al., 2001).

Cohesive responses/indicators/factors - are verbal immediacy behaviors that build and sustain a sense of group commitment, and presence and support the development of community (Rourke et al., 2001).

Online learning environment – is a web-based environment in which technology and teaching strategies are combined to deliver knowledge.

Facilitation – is defined as the role of the instructor or any individual tasked with guiding student learning in an online learning environment.

Course design – refers to all aspects of course structure.

Community size – is defined as the number of students enrolled in a given online course at a specific time.
Limitations of the Study

While it was the goal of this study to determine the importance (value) learners attach to different factors that influence social presence, it is by no means exhaustive due to the method of analysis that was utilized, regression analysis. In multiple regression analysis, it is recommended that fewer variables be utilized for the purposes of parsimony (Hinkle, Wiersman, & Jurs, 2003).

The study was also limited in that it relied on self-reported measures of social presence. While utmost care was exercised to ensure that the results were objective, subjectivity of participants could not be overruled based on their experiences using online learning environments. In addition, recency and prima effects could have affected the results.

The study was not able to survey all the learners enrolled in online programs. It was the assumption of the researcher that all factors associated with social presence were present in all the courses the students/respondents were enrolled in. This might not have been the case because of the feedback respondents sent back explaining why they responded the way they did. A few respondents indicated that some items in the online questionnaire did not match their experiences.

Delimitations of the Study

There are several factors that could influence the perceived social presence of online learners, some internal and others external. The current study was concerned with few of these factors, specifically users’ use of social rules to interpret and respond to others in computer-mediated communication. The study was restricted to learners enrolled in online courses administered by one large Midwestern university. Students
enrolled in the program/courses were largely from the state where the university is located.

Organization of the Study

This study is organized in the following way: Chapter one contains the introduction of the study, the statement of the problem, research questions, the significance of the study, the definition of terms, the limitation and delimitation of the study, and finally the organization of the study.

Chapter two consists of a critical review of the literature. Chapter three reviews the methodology employed in the study, including the development of the pilot study and the selection process. Chapter four presents results of data analysis and findings. Chapter five summarizes and interprets the findings of the study. The implications of the study for practice, recommendations, and conclusions of the study are also presented in chapter five.
CHAPTER TWO: Literature Review

The purpose of this chapter is to present a review of the literature relevant to the study. The literature is organized into nine sections. The first section traces and gives a brief review of the historical roots of social presence. In the second section, a conceptualization of the broader and general concept of presence, which entails social presence, telepresence, and co-presence, is presented. Once the history of presence and its conceptualization is laid out, the third part of the chapter summarizes literature on social presence and the definitions of the same that have been suggested and used by different researchers. The remaining section of the chapter focuses on the different ways in which social presence and presence in general have been measured. More specifically, subjective self-reported measures, behavioral measures, and psychophysical measures are addressed. Additionally, an examination of how social presence is generated is reviewed in terms of affective responses, cohesive responses, interactive responses, course design, and community size.

Historical Foundations of Social Presence

The roots of social presence can be traced back to the influential work of Mehrabian’s (1969) idea of immediacy, which he defined as those communication behaviors that enhance closeness to and nonverbal interaction with another. That is, social presence refers to those communication behaviors that enhance closeness and bonding among people. Immediacy is both verbal and nonverbal. A verbal immediacy behavior is a sense of psychological closeness produced by word selection. In other words, verbal immediacy behaviors are linguistic differences in expression from which feelings of like and dislike are inferred (Gorham, 1988). For example, the employment of
“ours,” addressing individuals by name, use of humor, discussion, and sharing of personal examples are verbal behaviors, which produce immediacy and contribute to a sense of psychological closeness. In contrast, nonverbal immediacy is the mental or psychological closeness produced in the course of the physical communicative process. The nonverbal cues can be expressed through facial expression, eye contact, posture, touch, body movement, and proximity. Mehrabian (1969) found that nonverbal cues increase sensory awareness and stimulation of interlocutors or participants prompting more intense, affective, and immediate interactions.

Following up Mehrabian’s (1969) work were studies conducted by communication theorists (Short, Williams, & Christie, 1976) who examined an array of media such as voice mail, facsimile machines, and audio-teleconferencing in organizational settings. From the findings of the studies, Short et al. (1976) suggested that the incapacity of these media to transmit nonverbal cues would negatively affect interpersonal communication as proposed by Mehrabian. Short et al. (1976) introduced the term “technical social presence” and defined it as the medium’s capacity to present “the salience of other person in a mediated communication and the consequent salience of their interpersonal interactions” (p. 65). They asserted that different communication media transmit varying degrees of social presence based on their ability to send out nonverbal and verbal information. Byam (1995), Gunawardena and Zittle (1997), and Walther (1994), questioned this view, and explained that perceived social presence in online interactions differs among participants in the same mediated exchange. Gunawardena and Zittle (1997) concluded that social presence was as much a matter of individual perception as an objective quality of the medium.
The concept of social presence, “the degree to which a person feels ‘socially present’” (Leh, 2001, p. 110) or “the degree to which participants are able to project themselves affectively within the medium” (Garrison, 1997, p. 6) has its base in the umbrella notion of presence, “being there.” Social presence cannot be studied exhaustively without understanding and referring to the general concept of presence. Different impressions come to mind when the term “presence” is suggested. They are as diverse as there are disciplines, individual orientations, and experiences. Lombard and Ditton (1997) aptly affirm that the concept of presence has been studied from a variety of viewpoints in a number of fields such as cognitive science, psychology, communication, engineering, and arts yet no one precise concept has been accepted. On reviewing extensive analysis of presence in media and communication literature, Lombard and Ditton (1997) present six interconnected but distinct conceptualizations of presence, namely, presence as social richness, presence as realism, presence as transportation, presence as immersion, presence as social actor within medium and presence as medium as social actor. These conceptualizations can be summarized as:

1. Presence as social richness is related to the degree to which media used is capable of making the participants “feel” or perceive the sociability, warmth, sensitivity, closeness, and personality of others in a mediated communication encounter (Lombard & Ditton, 1997).

2. Presence as realism is concerned with the degree to which a medium can produce representations that look, sound, and feel like the actual/real thing. This conceptualization of presence is often used in a vague manner that misses or fails
to distinguish between two key types of realism, social realism and perceptual realism (Lombard & Ditton, 1997). Lombard and Ditton define social realism as the extent to which a media portrayal is “true to life” because it reflects events that do or could occur in the nonmediated world.

3. Presence as transportation involves three different types. First, you are there, where the user is transported to another place. Virtual reality could be used as an example where the user is ideally taken to the world generated by the computer environment. Second, it is here, this is where another place and the objects within that place are transported to the user, such as watching a television program or a movie. Third, we are together, where two or more communicators are transported together to a place that they share (Lombard & Ditton, 1997).

4. Presence as immersion entails perceptual and psychological immersion. Biocca and Delaney (1995) define perceptual immersion as “the degree to which a virtual environment submerges the perceptual systems of the user” (p. 57). According to Palmer (1995), when users feel immersive presence they are involved, absorbed, engaged, and engrossed. Shin (2002) adds that with the help and use of technical devices attached to communication media, users feel that they exist physically, psychologically, and perceptually in a different world. Shin (2002) moves on to say that with eyes covered with a head-mounted display, ears covered with headphones, and hands covered by gloves, users could be convinced that they are in a different world.

5. Presence as social actor within a medium refers to the fact that users’ perceptions and their resulting psychological processes lead them to illogically
overlook the mediated or even artificial nature of an entity within a medium and attempt to interact with it (Lombard & Ditton, 1997). In other words, this conceptualization addresses media users’ social responses to entities within a medium. Examples may include responses of users to television and/or radio programs where they join, for instance, in singing, kicking the ball, or cheering on the side they support as they watch or listen. It could also be demonstrated by the response of users to computer or virtual actors in digital games.

6. Presence as a medium as a social actor, according to Lombard and Ditton (1997), involves social responses of media users not to entities within a medium but to cues provided by the medium itself. Social presence has rich interrelationships with these conceptualizations. Studies have shown that users respond to social cues exhibited by the medium and react to the medium as though it were a social entity (Nass, Steuer, & Tauber, 1994; Nass, Moon, Foggs, Reeves, & Dryer, 1995).

Out of the six conceptualizations of presence, presence as social richness is probably the most applicable to education as it describes the nature of communication among people (Shin, 2002).

*Transactional Distance, Interaction, and Social Presence*

Moore (1989) conceived transactional distance as a function of dialogue, structure, and learner autonomy. He postulated that distance was a pedagogical phenomenon rather than a function of geographical separation, which exist in face-to-face classes as well as online learning environments. Woods and Baker (2004) concur. According to Moore (1989), interaction is a complex, contentious, and multifaceted term that carries so many
meanings as to be almost useless unless specific submeanings can be defined and generally agreed upon. Moore described three distinct types of interaction in distance education, namely, learner-content, learner-instructor, and learner-learner. Similarly, Reigeluth (1999) broadly classified student interactions into human and nonhuman interaction.

Moore and Kearsley (1989) note that “every learner has to construct knowledge through a process of personally accommodating information into previous existing cognitive structures. It is by interacting with content that results in changes in the learner’s understanding” (p. 128). It can be implied that learner-content interaction is the process by which students examine, consider, and process course information presented. Learner-instructor interaction is communication between the instructor and the student.

In the case of online learning, the learner-instructor interaction occurs through computer-mediated communication. It entails varied interactions that expand beyond the instructional communication that occurs during the educational experience to encompass interactions related to advising, offline communication, and personal dialogue (Wood & Baker, 2004). Learner-learner interaction is communication between two or more students in a course, bringing into focus the community of inquiry. This interaction may take place in different formats and duration. The existence of weak social presence compounds difficulties in learner-learner and learner-instructor interactions, bringing with it the outcomes of low morale, frustration, and loneliness in learning. Learner-learner interaction can occur through synchronous or asynchronous computer-mediated communication, as well as small group communication online and offline.
Other researchers have extended Moore’s “triple” interaction. Hillman, Wills, and Gunawardena (1994) added learner-interface interaction, defined as a process of manipulating tools to accomplish a task. They noted; “When dealing with any tool, it is necessary for the user to interact with the device in a specific way before it will do his/her bidding” (p. 34). Hillman, Wills, and Gunawardena (1994) further distinguished between learner-interface interaction and the necessary mediation of an interface, which occurs in any interaction. They noted that for the technically challenged learner, the interface itself becomes an independent force which the learner must contend with in learning. This can have implications for perceived social presence. A learner not well versed with technology will make fewer contributions in an online discussion whether asynchronous or synchronous. Such learners while negotiating the interface through the trial-and-error method normally waste valuable time (Gunawardena & McIsaac, 2003). At times, they feel isolated and left behind in discussions, as they cannot keep up in communing with others in online forums. Thus, the learners experience less social presence.

Burnham and Walden (1997) have added their voice to the discussion. They recommended the inclusion of learner-environment interaction, which they described as a reciprocal action or mutual influence between a learner and the learner’s surroundings, which either assists or hinders learning. Burnham and Walden (1997) reported on the notion that interactions have objects (things learners interact with or that influence the learner) and subjects (things that the interaction is about). They recommended that the two parts should play a significant role in any classification of interaction. Burnham and Walden (1997) further observed that interaction triggers other events for yet another interaction, a phenomenon they referred to as “chaining” of interaction. Burnham and
Walden (1997) believe their views impact and are impacted by social presence. To them, objects that learners interact with in the course of learning either immerse them into or draw them away from a task, depending on the perceived level of social presence.

Anderson and Garrison (1998) added teacher-teacher interaction, teacher-content interaction, and content-content interaction to Moore’s original model, which further expanded the debate on interaction. As a result, teacher–teacher interaction considers the professional development efforts of teachers as they engage one another to enhance their pedagogical abilities through conferences, peer mentoring, seminars, electronic informal communications, team teaching, and peer evaluation. Teacher-content interaction is considered a component in the interactive model as a result of new technologies that enable teachers to interact with the content far more easily and more creatively than ever before. The growth in sophistication of online tools, such as databases, search engines, blogs, wikis, and content aggregators, increases the likelihood of significant content-content interaction occurring. Teachers who supposedly know and understand the “nitty-gritty” of rich interactions are more likely to transfer the same skills to their students and teaching, thereby enriching learning and connections among learners (Anderson & Garrison, 1998).

Anderson (2003) made a further revision of the interaction model. He distinguished between interaction that leads to learning in any informal context and those types of interactions that occur in a formal interaction context. Research in interaction, which is presumed to affect social presence, has implications for those tasked with designing online-learning environments. Gunawardena and Zittle (1997) observed that despite the characteristic of the medium, student perceptions of social and human
qualities of computer-mediated communication hinge on social presence created by the instructor/moderators and the online community. This finding echoes Eastmond (1993) results, who reported that characteristics often associated with computer-mediated-communication such as interactivity, collaboration, and reflectivity are not inherent to the medium but can result based on design, moderator roles, participation patterns, and involvement. It is the combination of these skills and techniques by those tasked with designing online learning environments that will influence learners’ perception of interaction and social presence (Eastmond, 1993).

Other studies have emphasized the need for the inclusion of interaction in online learning. Schrum and Hong (2002) propose that the most important role of the instructor in online classes is to ensure a high degree of interactivity and participation, which supports an increase in the sense of social presence. Similarly, Parker and Gemino (2001) underscore the pedagogical benefits of student interaction and caution that it is less likely to occur without careful instructor planning. They drive home the point home by stating:

The sentiment of many faculty is to teach the same course offered on campus with the addition of a few more handouts. To those experienced in the art of distance delivery, it is evident that the addition of a few more handouts is not the solution for interactive course design….The challenge lies in the refocusing of the instruction to embody a component of interaction. (p. 16)

The refocusing of instruction may take the form of increased group discussions, debates over a topic when students are divided into groups supporting or opposing the topic, peer critique and support, and problem-based activities (Gunawardena, Lowe, & Anderson, 1997). Woods and Ebersole (2003) found that encouraging student interaction
in personal discussion folders contributes to productive faculty-student relationships, positive relationships among the students, a sense of community, and satisfaction with the overall learning experience.

*Research on Social Presence*

The definition of social presence and its measurement continues to be debated by researchers in both face-to-face and technology-mediated learning. Social presence is a construct that has a number of varied definitions but none that is acceptable to all players in both distance and traditional face-to-face education. The difficulty of how to define, measure, control, and design for social presence continues to be a challenge and a practical problem in communication theory, virtual environment design, and psychological measurement (Barfield, Zeltzer, Sheridan, Slater, 1995; Draper & Blair, 1996; Ellis, Dorighi, Menges, Adelstein, & Jacoby, 1997; Freeman, 1999; Held & Durlach, 1992; Lombard & Ditton, 1997; Palmer, 1995; Short et al., 1976).

Social presence has been defined and operationalized in many ways based on researchers’ perspectives, goals, and field of study. Some operational definitions that have been advanced and used in the literature include Short et al. (1976), who in their study of face-to-face, audio, and closed-circuit television, defined social presence as the "degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships" (p. 65). They postulated that the critical factor in a communication medium is social presence. To assess social presence, participants carry out various assignments using different media and evaluate each media by a series of bipolar seven-point semantic differential items comprising impersonal-personal, unsociable-sociable, insensitive-sensitive, and cold-warm. In this case, the status and
level of social presence is determined by the interaction of the medium and the task being performed and is based on the individual opinion of the user. Short et al. (1976) measurement of social presence has been criticized because of its inability to thoroughly capture the perception of social presence (Tu, 2002a). It has been argued that the measure leaves out some important variables of social presence, such as privacy and recipients’ topics (Tu, 2002a).

Durlak (1987) proposed three dimensions of social presence; potential of immediate two-way exchange, ability to convey nonverbal cues, and ability to convey the context in which nonverbal cues are used. These dimensions were redefined by Tu (2002b) in an online learning environment utilizing computer-mediated communication (CMC) as social context, online communication, and interactivity. He notes that social context is constructed from the CMC users’ characteristics and their perception of the CMC environment while online communication consists of the attributes of the language used online and the applications of online language. Interactivity includes the activities in which CMC users engage and the communication styles they use.

According to Picciano (2002), social presence is defined as a student sense of being in a course. In his article titled “Beyond Student Perceptions: Issues of Interaction, Presence, and Performance in an Online Course,” Picciano (2002) replicated survey items used by Gunawardena and Zittle (1997) and Richardson and Swan (2001) to examine and assess perceived social presence, interactivity, and learning among students. The results of the study indicated a high correlation among the variables. Interestingly, the study found no correlation between these variables and actual student performance on tests or written assignments.
Christophel (1990), Gorham (1988), and Kearney, Plax, and Wendt-Wasco (1985) described social presence in terms of teacher immediacy. They stated that social presence entails both verbal and nonverbal behaviors which creates a sense of immediacy, through actions such as gesturing and smiling, humor and vocal variety, personalizing examples, addressing students by name, questioning, praising, initiating discussion, encouraging feedback, and avoiding tense body positions (Hackman & Walker, 1990). Raising a similar sentiment, Tu and McIsaac (2002) note that factors, which contribute to the degree of social presence in a face-to-face encounter, are facial expressions, the direction of a gaze, posture, dress, nonverbal and vocal cues.

Echoing a related opinion on the concept of immediacy, Gunawardena and Zittle (1997) added the concept of intimacy to typify social presence as a term associated with both intimacy and immediacy. The authors averred that intimacy is expressed by nonverbal factors, including physical distance, eye contact, and smiling. They defined social presence as the degree to which a person is perceived as real in mediated communication. In order to examine students’ notion of the social presence of others in a global education computer conference, Gunawardena and Zittle (1997) constructed and utilized a survey questionnaire. Using regression to analyze their findings, Gunawardena and Zittle reported that perceived social presence accounted for 60% of the variance in student satisfaction with the conference. Their results indicated that students who experienced a higher notion of social presence augmented their online communication through the use of emoticon to convey missing nonverbal cues in a textual form.

In another study examining the relationship between student perception of social presence in online courses, the students’ perceived learning and satisfaction with the
instructor, Richardson and Swan (2003) employed a modified version of the Gunawardena and Zittle (1997) survey. They reported that all three variables were highly correlated. The results of their study revealed that 42% of the variability in perceived learning was predicted by perceived social presence. Surprisingly to the authors, the study also found a strong correlation between perceived social presence and perceived learning from individual course activities, tests and individual assignments that are normally not considered as social activities.

Rourke, Anderson, Garrison, and Archer (2001) viewed social presence from a constructivist perspective and describe it as the ability of learners to socially and affectively project themselves in communities of inquiry. Garrison, Anderson, and Archer (2000) opined that the primary importance of social presence is the role it plays in supporting cognitive presence, thereby facilitating the process of critical thinking carried out by learners in a community of inquiry. Social presence becomes a critical direct contributor to the success of the educational experience when affective goals of the educational process are required (Rourke et al., 2001). It is also important when participants need to find group interaction personally meaningful and supportive. According to the research, this will encourage cohorts of learners to remain in the group and complete the program of study (Garrison, Anderson, & Archer, 2000).

Reaffirming the results of Rourke et al. (2001), Garrison et al. (2000) considered social presence as one of the three essential presences that support learning. The other two are cognitive presence and teaching presence. To elaborate on their views, Garrison et al. (2000) advanced a conceptual model, which they called a community of inquiry (Figure 2.1).

*Figure 2.1. Community of inquiry model*

The model posits that learning occurs through the interaction of three core elements in the community of inquiry, namely, cognitive, teaching, and social presence. In the model, cognitive presence is the extent to which the participants in any configuration of a community of inquiry are able to construct meaning through sustained communication. Teaching presence is characterized by designing and managing learning sequences, providing subject-matter expertise, and facilitating active learning (Garrison et al., 2000). Social presence, in contrast, consists of three indicators, namely, affective, cohesive, and interactive responses (Rourke et al., 2001). Affective responses contain personal expressions of emotion, feelings, beliefs, and values. Cohesive responses are communication behaviors that build and sustain a sense of group commitment, such as greetings and salutations and group or personal reference. While interactive responses are behaviors that provide evidence that others are attending, such as agreement/disagreement, approval and referencing previous messages, Rourke et al.
(2001) rightly pointed out that social presence supports cognitive objectives through its ability to instigate, sustain, and support critical thinking in a community of learners through exchange of ideas among learners. Moreover, social presence supports affective objectives by making the group interactions appealing, engaging, rewarding, and motivating. This quality of social presence leads to an increase in academic, social, and institutional integration--hence, increased persistence and course completion.

Garrison et al. (2000) viewed social presence in terms of emotional expression, open communication, and group cohesion. They noted that emotions are linked to task motivation and persistence. In their account, emotional expression is indicated by the ability and confidence of learners to express feelings related to the educational experience. Some emotional expressions that bring people together in a community include the expression of humor, which serves to decrease social distance and convey goodwill (Garrison et al., 2000), and self-disclosure. Proceeding on a similar note, Eggins and Slade (1997) stressed that the construction of group cohesion frequently involves the use of conversational strategies such as humorous banter, teasing, and joking. Eggins and Slade (1997) further argue that these strategies allow differences between group members to be presented without seriously challenging the consensus and similarity of the group. Self-disclosure, described as a sharing of feelings, attitudes, experiences, and interests, is another example of emotional expression that contributes to the development of social presence among individuals. Self-disclosure encourages others to be more open and forthcoming, leading to an increased sense of belonging, trust, and support.
Measurement of Social Presence

Numerous measures of presence have been proposed; however, none is widely accepted as a satisfactory measure. Tu (2002a) argues that current instruments are inadequate in measuring the complicated issue of online presence. Tu adds that a literature review reveals that most studies use a measure of the subjective quality of the communications medium created by Short et al. (1976) to measure and assess social presence. This approach uses a set of semantic differential scales that capture some of social and emotional capabilities of the medium: personal-impersonal, sensitive-insensitive, warm-cold, and sociable-unsociable. Several difficulties may be encountered in the use of the Short et al. (1976) social presence instrument (Tu, 2002a). First, Tu asserts that the four items of the test are too general to measure user perception of social presence in computer-mediated communication, a complicated human perception. Many variables, such as topics on recipients’ privacy, tasks, social relationships, and communication styles, are reported in the literature (Lombard & Ditton, 1997; Rourke et al., 2001); but these are hardly captured by the four general items advanced by Short et al. (1976), for example. The second difficulty stems from the faults of semantic differential techniques, when different respondents ascribe to different definitions and meanings. Third, Tu (2002a) points out that Gunawardena and Zittle's (1997) social presence instrument, like Short’s, is also unable to capture a thorough perception of social presence; this is because the test does not consider several important variables of social presence, such as privacy of recipients and questions created for specific groups of students.
Most research on social presence was conducted in noneducational settings, making the findings difficult to apply to learning environments, especially in the area of online learning (Tu, 2002a). Additionally, many of the studies were conducted using a single computer-mediated conference, and none examined the differences among CMC systems. The relational dynamics should be considered by the tests to minimize the feelings of isolation among learners and address the, high levels of attrition, reduced levels of student satisfaction, and poor academic performance (Woods & Baker, 2004).

Another difficulty encountered in measuring social presence is the variation of social presence between both different media and different versions of the same medium. It also varies based on characteristics of the medium and the different context arrangements (Tu, 2002a). The definition of social presence continues to be contentious without agreement on any one definition. Many researchers have opted to define social presence as the degree of salience of another person in an interaction and the resulting interpersonal relationship (Short et al., 1976; Walther & Burgoon, 1992). It is argued that this definition does not provide a clear concept of social presence. Moreover, the components of social presence and what affects the degree of social presence in CMC environments are not captured. Rafaeli (1990) observes that social presence theory is a vague concept because it lacks a clear definition. Despite the contention, measures of presence seem to be broadly clustered under subjective self-reported, behavioral, and psychophysical measures.

*Subjective Self-Reported Measures*

Subjective self-reported measures rely on the self-reported judgment of participants. These are the most commonly used measures of presence, despite their
inherent limitations given that social presence is generally a subjective sensation. They also vary widely in span and appearance based on the researchers’ conceptualization of presence and their setting of application. Sheridan (1992) contends that a subjective account is the fundamental basic measurement of presence. Thus, most studies have employed subjective evaluations to measure presence in the form of posttest questionnaires and rating scales. These are credited for their ease of use in form of administration, analysis, and interpretation as well as their inherent face validity; that is, they appear to measure the intended concepts while not disrupting the experience since the tests are administered afterwards. The self-reported measures are also cheap in terms of equipments required and time needed. It is equally possible to extract fundamental dimensions of the measured constructs by conducting factor analysis.

The main downside of the self-reported measures in the form of posttest questionnaires is their retrospective nature. Therefore, they are prone to numerous biases arising from the overreliance on participant’s memories, which at times may be incomplete reflections of the experiences. At other times, the participant’s judgments are likely to be influenced by the recency effect (events closer to the end of the experience). Another disadvantage of posttest questionnaires is their sensitivity to demand characteristics, hints and cues in research situations that may bias participant response. For example, in their study Freeman, Avons, Meddis, Pearson, & Ijsselsteijn (2000) have shown that simple posttest presence ratings are sensitive to the effect of unrelated prior training sessions.

On reviewing literature on subjective self-reported measures, it is clear that the posttest presence questionnaires have been categorized into measures that address
physical presence, those that measure both physical and social presence, and measures that address social presence. Several studies have employed subjective self-reported measures to measure presence (Barfield & Weghorst, 1993; Cho, Park, Kim, Hong, Han, & Lee, 2003; Dinh, Walker, Song, Kobayashi, & Hodges, 1999; Gerhard, Moore, & Hobbs, 2001; Gunawardena & Zittle, 1997; Hendrix & Barfield, 1996; Witmer & Singer, 1998). A commonly cited self-reported measure of social presence is one developed by Gunawardena and Zittle (1997) whose 14-point Likert-scale items were used to measure perceived social presence in their study “Examining Social Presence as a Predictor of Satisfaction within Computer-Mediated Conferencing Environments.” They found that social presence was a strong predictor of overall course satisfaction.

It is pertinent to note that other subjective measures of presence that do not directly appraise presence exist. These measures, called subjective corroborative indicators, furnish information about mental processes that are apparently connected to presence, such as attention, memory, and spatial cognition (IJsselsteijn, Oosting, Vogels, De Kort, Van Loenen, 2006; IJsselsteijn, De Ridder, & Freeman, 2001), and may reinforce the validity of presence measures.

Behavioral Measures

Social interaction involves behavior. Biocca, Harms, and Burgoon (2004) note that some definitions of presence include explicit or implicit references to some level of behavioral engagement, especially behavioral interaction or synchronization either as the essence or an indicator of social presence. Biocca et al. (2004) move on to say that, until the 1990s, most social presence research dealt with low bandwidth and as a result had limited emphasis on interactive behavior; hence, behavior variations were minimal and
rarely extended beyond the text-based verbal behavior and a narrow range of nonverbal communication behavior.

According to IJsselsteijn et al. (2001), behavioral measures are grounded on the impression that the participant's feeling of presence in an online environment is similar to what his/her responses will be to stimuli she/he will encounter in a similar real environment. Behavioral measures are not prone to participant bias, as they are usually not under users’ conscious control and do not require precise instruction from the experimenter. Behaviors indicating excitement, surprise, immersion, and body position, among others, occur impulsively without disrupting experiences such as watching an interesting movie by the participant. That is not to say that behavioral measures are without limitation, as they are likely to suffer from bias stemming from the experimenter tasked with observing and interpreting the observed behaviors. Additionally, data analysis can be time consuming and tricky to interpret. Behavioral measures are difficult to generalize to other settings or environments; instead they are usually applicable to a specific environment. To deal with the problem of experimenter bias, IJsselsteijn et al. (2001) suggests the utilization of independent observers who score the behavior based on a categorization selected in advance, followed by the calculations of interrater reliability.

Some of the behavioral measures that have been proposed to measure presence include facial expression, postural responses, reflex responses (Held & Durlach, 1991; Loomis, 1992; Nichols, Haldane, & Wilson, 2000); nulling (Prothero & Parker, 2003; Prothero, Furness, & Wells, 1995); pointing or conflicting cues (Slater, Usoh, & Chrysanthou, 1995); and social responses (Bailenson, Blascovich, Beall, & Loomis, 2001, Bailenson, Blascovich, Beall, & Loomis, 2003; IJsselsteijn, De Ridder, Freeman, &
Avons, 2000; Sheridan, 1992). Huang & Alessi (1999) proposed that facial observations could be used to examine emotional components of presence; nevertheless, the technique has not been widely used. Facial expressions are either scored by human observers or automatically recognized. Several methods exist to aid manual scoring; however, the Facial Action Coding System (FACS) and the Maximally Discriminative Affect Coding System (MAX) are the most commonly used (Ekman, 1982).

**Psychophysiological Measures**

Psychophysiological methods are used to measure physiological issues such as heartbeat, blood flow, electrodermal processes, reactions of the eyes, and muscular responses. It can be implied that as the sense of presence in virtual environments increases, the physiological reaction to the environment will become more similar to those displayed in a similar real environment (Ijsselsteijn et al., 2001). In general, psychophysiological measures are more objective and consistent, permitting the appraisal of time-varying qualities of presence. However, they suffer from the disadvantage of having difficulty extracting what is being measured. In addition, some psychophysiological measures, such as skin temperatures, take time to change (Insko, 2003). It is also noted that measurement equipment is expensive and the wearing of sensors may interfere with the participant’s experience.

**Generating Social Presence in Online Learning Environments**

A template for assessing (the presence or absence of) social presence in a computer-mediated communication has been proposed by Rourke, et al. (2001). The template identifies three factors, which the authors suggested contribute to social presence: emotional expression (affective responses), open communication (interactive
responses), and group cohesion (cohesive responses). To validate their content analysis findings that generated the template, Rourke, et al. (2001) tested the coding scheme used in their study by analyzing two graduate-level courses. The study reported high interrater reliability and concluded that the template could be used for formulating and testing hypotheses in which social presence is a variable. The social presence template of Rourke et al. (2001) has been revised further by (Swan, 2002) who added more items to the original template. A summary of Rourke’s, et al. (2001) template is shown in Table 2.1.
Table 2.1

_Model and Template for Assessment of Social Presence_

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Affective responses</th>
<th>Interactive responses</th>
<th>Cohesive responses</th>
</tr>
</thead>
</table>

| Definitions | 1. Conventional or unconventional expressions of emotion, use of emoticons 2. Teasing, cajoling, irony, understatements, sarcasm. 3. Details of life outside of class, or expresses vulnerability | 1. Using software features to quote others entire message or cutting and pasting selections of others’ messages 2. Direct references to contents of others’ posts 3. Complimenting others or content of others’ messages 4. Expressing agreement with others or content of others’ messages | 1. Addressing or referring participants by name 2. Addresses the group as we, us, our group 3. Communication that serves a purely social function |

| Examples | 1. “I just can’t stand it when…!” 2. The banana crop is looking good this year 3. “Where I work, this is what we do…” “I just don’t understand this question” | 1. Software dependent, e.g. “Martha writes.” Or text prefaced by less-than symbol 2. “In your message, you talked about Moore’s distinction between…” 3. “I really like your interpretation of the reading” 4. “You really hit the nail on the head.” | 1. “I think John made a good point”. “John, what do you think?” 2. “Our textbook, we veered off track…” 3. “Hi all” “That’s it for now” weather here |

Affective Responses

Affective responses are personal expressions of emotion, feelings, beliefs, and values (Rourke, et al., 2001). It is further suggested that affective responses are a way of projecting personal immediacy or social presence into online discourse. It is a means for making up for the lack of gestures, facial expressions and/or intonation present in face-to-face communication (Rourke, et al., 2001). The use of phatics, defined as communications used to share feelings, establish mood of sociability rather than to communicate information or ideas and intended to reinforce ties among groups, is an example of an affective indicator (Swan, 2002). See Table 2.2 for examples of affective indicators.
Table 2.2

*Affective Indicators*

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Features of text outside formal syntax used to convey emotion</th>
<th>Use of descriptive words that indicate feelings</th>
<th>Expressing personal values, beliefs, and attitudes</th>
<th>Use of humor-teasing, cajoling, understatement, irony, sarcasm</th>
<th>Sharing personal information, expressing vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>How awful for you :- ( Mathcad is definitely NOT stand alone software;</td>
<td>When I make a spelling mistake, I look and feel stupid; I get chills when I think of...</td>
<td>I think that commercialize -tion is a necessary evil; I feel our children have the same rights</td>
<td>God forbid leaving your house to go to the library; Now it is like brushing my teeth</td>
<td>I sound like an old lady; I am a closed writer; We had a similar problem....</td>
</tr>
<tr>
<td>Source</td>
<td>Bussman, 1998; Rourke, et al., 2001; Poole, 2000</td>
<td>Rourke, et al., 2001</td>
<td>Emergent</td>
<td>Eggins &amp; Slade, 1997; Rourke, et al., 2001; Poole, 2000</td>
<td>Cutler, 1995; Rourke, et al., 2001; Poole, 2000</td>
</tr>
</tbody>
</table>


According to Cutler (1995), “the more one discloses personal information, the more others will reciprocate, and the more individuals know about each other, the more likely they are to establish trust, seek support, and thus find satisfaction” (p. 326).

Additionally, Tinto (1995) observed that “social interaction via friendship support is directly related to persistence in college” (p. 107). Echoing related views on affective
indicators of presence, Yoon (2003) found that social behavior accounted for 26.3% of the total performed behaviors by virtual teams. Greetings, sharing of one's personal life, conversing about work and professional interests, discussing the course, pairing and member support, and expressing humor were identified as examples of social behavior that foster social presence (Yoon, 2003). Yoon further posits that virtual team members attempt from the onset to enhance the social presence within an online environment, and those relationships between group members gradually transform from formal to informal over time.

Cohesive Indicators

Cohesive indicators are verbal immediacy behaviors that build and sustain a sense of group commitment and group presence (Rourke et al., 2001). They also support the development of community. Learning is facilitated and optimized when students see themselves as part of a group rather than as individuals. Building cohesion and a sense of belonging is important for sharing personal meaning and for participation and emotional support. Open communication and constructive criticism that appreciates strengths, weaknesses, and the presence of others should be encouraged in the learning community. Reciprocated awareness helps to shape the learning activities of each participant (Swan, 2002).

Responses and rejoinders build and sustain relationships, express a willingness to maintain and prolong contact and directly or indirectly indicate interpersonal support, encouragement, and acceptance of others (Eggins & Slade, 1997). Personalizing responses or questions brings learners closer. During discussions in an online educational setting, an instructor or any other group member may ask probing questions that require
learners to provide more support, and to be more focused, clear and specific. Examples of these are asking questions, “How did you arrive at that conclusion?” “I don’t quite understand” “please, explain a bit more.” Adding names of learners into such questions makes the presence and support of others more realistic (Hackman & Walker, 1990). For example, asking, “Moore, please tell me, how did you arrive at that conclusion?” “Please, Selina, explain a bit more on the point you raised.” “Barbara, I do not quite understand what you mean, do you have any more hints or insights into your reasoning” bring more perceived closeness when encouraged (Hackman & Walker, 1990). This reduces the transactional distance between and within members of community of inquiry. Examples of cohesive indicators, their definition, examples, and research sources are given in Table 2.3.
### Cohesive Indicators

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Greetings, closures</th>
<th>Addressing classmates by name</th>
<th>Referring to the group as we, us, our</th>
<th>Phatics, sharing information unrelated to the course</th>
<th>Reflection on the course itself</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Examples</strong></td>
<td>Hi Mary; That’s it for now, Tom</td>
<td>You know, Jane ...; I totally agree with you Charles</td>
<td>We need to be educated; Our use of the Internet may not be free</td>
<td>Happy Birthday! to both of you!!!</td>
<td>A good example was the CD-ROM we read about</td>
</tr>
</tbody>
</table>

Source: Swan (2002, p. 26)

### Involvement/Participation and or Interactive Indicators

Interactive indicators provide evidence that the other is attending (Rourke et al., 2001). Moreover, interactive indicators might be thought of as suggesting interpersonal presence, immediacy, and support among communicators (Swan et al., 2001). Tu (2002b) notes that in online learning environments, a heavy workload occurs for both teachers and students and may have a negative impact on the level of interaction. Multiple messages are allowed to occur simultaneously, unlike in face-to-face discussions. Students can
easily lose a sense of who is talking about what and to whom, which can inhibit interaction and the sense of community (Tu, 2000b). To enhance interaction, research suggests that the design of system interface is critical. It facilitates the sharing of meaning thus increasing understanding between learners and their point of view during interaction (Tu, 2000b).

The amount of student interaction/participation is a vital factor in the success of online learning environments. According to Winograd (2002) “full participation in a conference (computer-mediated communication) is critical to its success and it has been found that a good way to achieve this is to contract for participation” (p. 2). A study conducted by Winograd (2002) found that only 20% of students posted anything online when participation was voluntary. Since full participation was critical to the success of online learning, Winograd (2002) proposed that there needed to be an agreement or expectation provided not only on the frequency but also on the quality and length of the participation.

Salmon (2000) conducted another study on online participation. The study reported that 75% of participants indicated that they had actively participated online. Salmon (2000) also reports that half of the participants commented on the value of passive participation, which she described as browsing, listening, or “lurking” (reading messages sent to an online discussion forum without contributing). Salmon agrees that passive participation impacts the sense of social presence among participants in online learning environments. Her study further found that the active participants became upset with the passive participants in online courses.
Well-organized and coordinated online communities can be successful forums for both collaborative and cooperative learning, where learners take on particular roles and play significant parts within the established community of learners. Ramondt and Chapman (1998) reported that groups sharing and learning together felt a sense of fun and adventure which the authors described as true delight. Tu and McIsaac (2002) found that timely responses to CMC messages, use of stylistic communication styles, casual communications, communication strategies, appropriate length of messages, planning, creativity, decision making, social tasks, and appropriate communication size are all critical to online interaction, particularly in asynchronous communication.

Hannifin and Peck (1988) enumerated the functions that interaction purport to support in an education context - - pacing, elaboration, confirmation, navigation, and inquiry. According to Hannifin and Peck (1988), interactive pacing of the educational experience operates in a distance context from both a social perspective, as in keeping an educational group together, and an individual perspective, as in prescribing the speed with which content is acted upon and presented. Elaborative interactions serve to develop links between new content and existing schema, allowing learners to build more complex, memorable, and retrievable connections between existing and newly acquired information and skills. Confirmation interaction serves to reinforce and shape the acquisition of new skills. Traditionally, confirmational interaction takes place between student and teacher but is also provided by feedback from the environment through experience and interaction. These experiences include interaction with content in laboratories, working through content formatted in computer-assisted tutorials and from peers in collaborative and problem-based learning. Navigational functions prescribe and
guide the way that learners interact with each other and with content. Hannifin’s conception of inquiry focused on a computer system that displayed content and monitored student response. The interconnected and more widely accessible context for inquiry provided by the Internet now opens the door to much greater quantity and quality of interaction.

Raising related sentiments, Ekhaml (1999) presented a number of activities, such as online debate, guest speakers, online peer evaluation, bulletin boards, and case studies, as ways of fostering participation. Ekhaml, concludes:

Collaborative learning increases student’s motivation levels, eliminates their sense of isolation in online learning, and enhances the entire atmosphere of the online community. Just as there is no best medium or best instructional technique, there is no best way for establishing interactions in online distance learning. (p. 4)

Examples of interactive indicators are given in Table 2.4.
### Table 2.4

**Interactive Indicators**

<table>
<thead>
<tr>
<th>Acknowledgement (AK)</th>
<th>Agreement/disagreement (AG)</th>
<th>Approval (AP)</th>
<th>Invitation (I)</th>
<th>Personal advice (PA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referring directly to the contents of others’ messages;</td>
<td>Expressing agreement or disagreement with others’ messages</td>
<td>Expressing approval, offering praise, encouragement</td>
<td>Asking questions or otherwise inviting response</td>
<td>Offering specific advice to classmate</td>
</tr>
</tbody>
</table>

**Explanation**

<table>
<thead>
<tr>
<th>Examples</th>
<th>Acknowledgment</th>
<th>Agreement/disagreement</th>
<th>Approval</th>
<th>Invitation</th>
<th>Personal advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Those old machines sure were something! I agree that it is the quickest way; I also agree that software can make or break it</td>
<td>I’m with you on that; I agree; I think what you are saying is absolutely right</td>
<td>You make a good point; Good luck as you continue to learn; Right on!</td>
<td>Any suggestion(s)? How old are your students? Would you describe that for me; I’m unfamiliar with the term</td>
<td>Also the CEC website might have some reference I would be happy to forward</td>
<td></td>
</tr>
</tbody>
</table>

**Source**

Rourke, et al., 2001; Poole, 2000; Rourke et al., 2001; emergent

**Community Size**

Community size in computer-mediated environments greatly influences learning (Rice, 1994). A meta-analysis study conducted on traditional classrooms by Glass and Smith (1979) continues to be central in discussions on class size. The meta-analysis consisted of 80 studies that examined small and large class sizes with respect to student achievement, classroom processes, and teacher and student attitudes. The study reported
that smaller classes were significantly better than larger classes as related to student achievement, classroom processes, and teacher and student attitudes. Contributing further to the significance of community size, Rovai (2002) notes that too few members generate fewer interactions and too many members generate a sense of being overwhelmed. Hiltz and Wellman (1997) disagree and argue that large classes or other types of large online communities do not necessarily lead to information overload and a loss of feeling “normal.” They go on to say that special software tools and software-supported interaction structures and roles can aid coordination of large online groups. In addition, dividing up larger classes into small teams with role structures that facilitate the teams’ specific collaborative work will help larger classes function reasonably well (Hiltz & Wellman, 1997; Rovai, 2002). It is also argued that when learners have a wider audience for their writing or other scholarly work, they tend to invest more effort in the process and learn more because there are more learner-learner and learner-content interactions (Jonassen, 1996).

Arriving at the exact numbers to determine optimal community size is difficult to establish because the chemistry of the community, as noted by Rovai (2002) is situational and varies with learners, instructors, and content area (Rovai, 2002). Tu and McIsaac (2002) point out that the size of discussion group exerts a major impact on online learners, especially in real-time discussions. They recommend that the real-time discussion group or chat be limited to two or three participants. If a larger group is necessary, Tu and McIsaac (2002) agree with Hiltz and Wellman (1997) that strategies that provide equal turn-taking among the community members must be applied.
**Course Design**

The design of online courses is pertinent to better learning in online environments. Research has reported that the sense of community, which is integral to the concept of social presence in online learning environments, can be initiated through course design (Garrison, Anderson, & Archer, 2000). Emphasizing the role of course design in online learning, Aragon (2003) suggests that social presence should be initiated through the actual design of an online course. He goes on to present different course design strategies that can facilitate establishment of social presence, such as developing a welcoming message for the course, inclusion of student profiles in the course, incorporation of audio, limiting class size, and structuring collaborative learning activities. Swan and Shih (2005) further underscore the importance of instructional design in supporting the development of social presence in the online learning environment.

The organization of the course is equally important in the online learning environment. It is reported that learners are pleased when their first visit to the online course provides them with all the information they need to begin their learning and in an organized manner (Conrad, 2002). Conrad further notes that anxieties of many learners in the online learning environment seem to revolve around the fear of not receiving all the pertinent details of assignments and course organization when needed, which to many students means as soon as possible. Courses that are well organized, with a clear timeline, brief introductions, clear expectations, and explanation of course outline, and have well-written course notes, along with clear and early descriptions and establishment of group work, are important contributors to good course start (Conrad, 2002).
Chapter Summary

In this review of the literature, the study underscored and condensed the disparate research on social presence in an educational setting. This was achieved by highlighting relevant work from, specifically, literatures related to historical roots of social presence, conceptualization of social presence, measurement of social presence and factors touted as necessary for the generation of social presence in an online learning environment.

The literature reviewed revealed the importance of social presence in online learning and viewed learning as a social activity. It is also revealed from research cited that social presence has been operationalized in a number of distinct but related ways. While social presence has been defined and measured differently in different fields, the literature seems to settle on three broad ways, namely, self-reported measures of presence, behavioral measures, and psychophysical measures. Affective responses, involvement, facilitation, course design, and community size were fleshed out from the literature as some factors that are thought to be necessary for the generation of social presence in online learning environment.

From the literature reviewed, none of the studies attempted to address the central focus of the current study that sought to find:

1. The relationship between factors thought to be responsible for social presence (affective responses, facilitation, involvement, gender, age, community size, and course design) and perceived social presence of postsecondary learners enrolled in online learning environments.

2. The relative importance of factors (affective responses, facilitation, involvement, gender, age, community size, and course design in explaining
perceived social presence amongst postsecondary learners enrolled in online learning environments.

Furthermore, in the literature reviewed, small sample size was a cause for concern in most studies.
CHAPTER THREE: Research Design and Methodology

Research Design

The purpose of this study was to explore the role of social presence in online learning environments. More specifically, the study examined whether affective responses, involvement, facilitation, gender, age, community size, and course design reliably predict social presence in an online learning environment. In addition, the study sought to analyze which of the predictor(s), affective responses, involvement, facilitation, age, gender, community size, and course design was more important in predicting social presence amongst postsecondary learners enrolled in online learning environments.

The research questions that guided the study were:

Q1. Do affective responses, facilitation, involvement, gender, age, community size, and course design predict social presence in an online learning environment?

Q2. Which of the predictors, affective responses, facilitation, involvement, gender, age, community size, and course design is more important in predicting social presence in online learning environment?

The following statistical hypothesis was tested in order to address research question one (Q1):

$H_0$: Affective responses, facilitation, involvement, gender, age, community size, and course design do not significantly predict social presence among postsecondary learners enrolled in online learning environments.

$H_A$: (the alternative hypothesis) stated that affective responses, facilitation, involvement, gender, age, community size, and course design significantly predict
social presence among postsecondary learners enrolled in online learning environments.

Symbolically, the statistical hypothesis for question one (Q1) was stated as:

\[ H_0: R^2 = 0 \]
\[ H_A: R^2 \neq 0, \text{ where } R^2 \text{ is the multiple regression coefficients.} \]

The research hypothesis tested for questions two (Q2) was stated as:

\[ H_0: \text{All the predictor variables (involvement, facilitation, affective responses, course design, community size, age, and gender) had the same effect on perceived social presences of postsecondary learners enrolled in online learning environments.} \]

\[ H_A: \text{All the predictor variables (involvement, facilitation, affective responses, course design, community size, age, and gender) had different effects on perceived social presence of postsecondary learners enrolled in online learning environments.} \]

Symbolically, the statistical hypothesis was represented as:

\[ H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 \ldots = \beta_K = 0 \]
\[ H_A: \text{Not all } \beta \text{ are } = 0 \]

Where \( \beta_1 \ldots \beta_K \) are regression coefficients of the predictors

**Population of Study**

The participants for this study were students enrolled in the Lifelong Learning program delivered online at a Midwestern university through the Office of Lifelong Learning. The students in the program were mostly drawn from around the state of Ohio and took their classes from any location where they had access to computers and the
Internet from their homes, libraries, or even workplaces. The students were enrolled in many different courses taught by different professors. The students were also enrolled in different majors. Blackboard was the main learning management system used to deliver course content. The study utilized a simple random sampling procedure to draw a random number of students to survey (using SPSS random number generator) from a pool of all registered students in the program.

Students in different stages of their study, from beginners to those in final year of study, were targeted as the accessible population. The students were selected by the researcher based on the assumption that the training given to learners on how to access course materials, specifications of software and hardware needed, the general requirements at the beginning of the course, and the readily available help services to learners were sufficient to address technical complications and complaints that sometimes plague online learners. The assumptions were reaffirmed by personal communication with, an administrator of the program who echoed similar sentiments. The researcher hoped that the training on technical issues and help available to students would help check and address any influences on students’ perception of social presence that would arise outside of what was being studied, such as frustrations arising from not being able to access course materials or enter chat sessions.

**Sampling Plan**

A complete listing of all students enrolled in online courses and programs, and their contact information (email addresses) was sought from the Office of Lifelong Learning, tasked with the administration of the program. The estimated minimum sample size required was doubled to account for nonresponses, usually considered high in online
surveys (Crawford, Couper, & Lamis, 2001; Sax, Gilmartin & Bryant, 2003). The sample was then randomly drawn using simple random sampling procedure from a list of all students who took classes in the spring and summer quarters of the 2005/2006 academic year. It was hoped that the random sampling took care of variations that could arise among learners/students such as students’ past experiences, course differences, and instructors teaching styles.

**Power and Sample Size Determination**

How large should the sample be is always a difficult question in research and one which has no definite answer. Multiple factors come into play in determining appropriate sample size. This study considered the level of significance and the power of the test. The level of significance is defined as the probability of making a Type I error (rejecting a null hypothesis when it is true). In this study a priori, that is, the acceptable risk of making a Type I error, was set at 0.05. This was based on findings reported and utilized in much social science research (Hinkle, Wiersman, & Jurs, 2003).

Power is defined as the probability of rejecting a false null hypothesis. It is what precisely a researcher seeks to accomplish. Researchers have recommended that it is usually more befitting to consider the question of desired power before collecting data. In other words, the issue of appropriate and/or acceptable level of power is actually a priori question.

In order to ensure sound findings, this study sought to minimize both Type I and Type II errors. Several authors (Hinkle et al., 2003; Tabachnick & Fidell, 2001), among others, have suggested that for most behavioral science studies, Type I errors are generally more serious than Type II. They propose a 4:1 ratio of beta ($\beta$) to alpha ($\alpha$). In
the case of this study, the level of significance was established at 0.05 and the corresponding power, based on the 4:1 ratio of beta to alpha was set at 1-4(0.05) = 0.80.

Since the study examined seven predictors (independent variables), from the rule of thumb (Green, 1991; Tabachnick & Fidell, 2001), the appropriate minimum sample size was arrived at using the formula: \( N \geq 50 + 8m \) (where \( m \) is the number of independent variables) for testing the multiple correlation and \( N \geq 104 + m \) for testing individual predictors. The rule of thumb assumes a medium-size relationship (effect size) between the independent variables and the dependent variable, \( \alpha = 0.05 \) and \( \beta = 0.20 \) (Tabachnick & Fidell, 2001). Based on the aforementioned rule of thumb, this study required a minimum of \( 50 + (8) (8) = 114 \) cases to test regression and \( 104 + 8 = 112 \) cases for testing individual predictors. Tabachnick and Fidell (2001) recommend that if one is interested in both the overall correlation and the individual predictors (independent variables), then the calculation of \( N \) in both ways should be conducted and the larger number of cases chosen, which for this study was at least 114 cases.

**Measurement and Instrumentation**

An independent variable is a variable that is believed to have some influence on a criterion or a dependent variable. Independent variables may also be referred to as factors or predictors in the case of regression analysis. In an experiment, the independent variable is the variable directly manipulated by the researcher because of the assumption that it is the one that causes a change on the dependent variable. This study examined seven independent variables or predictors, namely, affective responses, facilitation, involvement, community size, course design, age, and gender. The dependent variable in
the study was the perceived social presence of post secondary learners enrolled in online learning environment.

The study utilized a survey methodology to collect data. Part of the survey instrument was adapted from GlobalEd Questionnaire, a social presence scale originally constructed by Gunawardena and Zittle (1997) for their research examining social presence as a predictor of satisfaction within computer-mediated conferencing environments. The GlobalEd Questionnaire was modified from the original in several ways to suit the goals of the current study (the authors of the instrument were consulted and consented to the use of their instrument). The original questionnaire contained 61 items on a 5-point rating scale measuring the variables for social presence (14 items), satisfaction (10), technical skills and computer-mediated conferencing (CMC) experience (3), attitude towards CMC (2), technical barriers (2), active participation (1), capability of mastering CMC (1), equal opportunities (1), and training (1).

Some items from the original GlobalEd Questionnaire, such as capability of mastering computer-mediated conference, and attitude towards computer-mediated conference, were dropped. These items were not directly of interest to the study and were not addressed by this study. The wordings and language of the questionnaire was also modified to correspond to the current study environment rather than the Global Education environment. The GlobalEd Questionnaire was selected because research has suggested that it was produced from the most extensive body of empirical research related to social presence and its influence on online learning environments (Aragon, 2003). The questionnaire was also selected because it showed a strong internal consistency of the social presence scale of 0.88.
Items measuring independent variables (predictors) were derived from literature. The work of Rourke, et al. (2001), who devised a template for assessing social presence, was greatly relied upon to construct items for predictors. Other research studies were consulted, including Aragon (2003); Arbaugh (2000); Biocca et al. (2001); Biocca & Harms (2002); Biocca, et al. (2004); De Greef & Ijsselsteijn (2001); Hiltz (1997); Lombard et al. (2000); Nowak & Biocca (2003); Swan (2002); Tu (2002a); Tu (2002b); Usoh, Catena, Arman, & Slater (2000); Witmer & Singer (1998). The final instrument was developed to contain a blend of items drawn from the cited literature and measured on a five-point Likert scale, ranging from 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = strongly disagree.

*Validity and Reliability Issues*

According to Light, Singer, and Willet (1990), validity describes how well a measure assesses what is being measured. They move on to say that validity is a relative concept, describing the soundness and appropriateness of a measure for one’s purpose. Light, et al. (1990) caution that because one researcher established a measure to be valid for his/her purposes, it will be equally valid for another researcher’s use. Light, Singer and Willet state that measures are not universally valid and recommend that each time a measure is used with different people, for a different purpose, in a different context, or at different time, validity should be reassessed. This study paid keen attention to the suggestions by Light, et al. (1990) and assessed validity with respect to all the measures it utilized.
Content Validity

In general, content validity examines how representative and comprehensive the items are in creating the constructs in a given instrument. A measure is content valid if its respective items together cover the different domains one want to measure (Light et al., 1990). It is assessed by examining the process by which the items were generated (Straub, 1989). Cronbach (1971) and Kerlinger (1964) state that a construct valid in content is one that has drawn representative questions or items from a universal pool. In this study, items measuring constructs of interest were derived from existing literature, where they had been shown to exhibit both face and sampling-content validity. Despite the reported validity of the constructs, the study consulted experts in the field to reassess the content validity of the instrument’s items. The experts asserted that the content of instrument was valid.

Construct Validity

Construct validity examines the extent to which a construct measures the variable of interest. If the constructs are valid in this sense, they should demonstrate relatively high correlations between measures of the same construct. In the same vein, construct reliability will be assessed using Cronbach’s alpha value. Rivard and Huff (1988) suggest that a measure for reliability should be higher than 0.5 and ideally higher than 0.70. Nunually (1978) also recommends that the Cronbach alpha of a scale should be greater than 0.70 for items to be considered reliable and to be used together as a construct.

Validating Regression Model

In this study, the validation of the regression model was done by assessing the value of adjusted $R^2$. The adjusted $R^2$ value indicates the shrinkage or loss of predictive
power; that is, it indicates how much variance in the outcome variable (dependent variable) would be accounted for when the model is applied to a new sample derived from the population from which the original sample was taken.

Statistical Package for Social Scientists (SPSS) derives adjusted $R^2$ value using Wherry’s equation (Field, 2000), which has been criticized because of its shortcomings in telling how well the regression model would predict scores of a different sample of data from the same population. To overcome this shortcoming, Stevens (1996) has recommended the use of Stein’s formula, stated as: Adjusted $R^2 = 1 - [(n - 1/n - k - 1) (n - 2/n - k - 2) (n + 1/n)] (1 - R^2)$, where $R^2$ is the unadjusted value from the SPSS output, $n$ is the number of cases/subjects, and $k$ is the number of predictors in the model; in the case of this study, there are seven predictors, namely, involvement, facilitation, affective responses, community size, course design, age and gender.

Data Collection Procedures

The survey was conducted online hosted by a commercial vendor, http://www.surveymonkey.com. The link to the survey was sent to participants. Each survey was accompanied by a cover letter containing instructions to assist participants in satisfactorily completing the survey. A statement of the purpose of the study and a confidentiality statement informing participants how the data collected were to be used and reported were also included. Confidentiality of respondents in the study was accorded the utmost seriousness it deserved. The survey was sent out in July 2006. Participants were given three weeks to respond to the survey, with three reminders. The first reminder was sent out in late July while the second one was dispatched in mid-August. A third reminder was sent towards the end of August because the response rate
was less than the expected 20% anticipated by the researcher. The third reminder was sent to participants who had not responded to the survey and who had not declined to participate in the study after the first two reminders.

Data Analysis Procedures

This study utilized correlation and regression analysis to analyze data. Social presence was the dependent variable while affective responses, facilitation, involvement, gender, age, community size, and course design were the independent variables in the study. Correlation analysis was performed between the dependent variable and independent variables. Regression analysis using the ENTER method in SPSS was performed on the data collected. Field (2000) notes that the ENTER method is encouraged when there is no sound theoretical base to explain the order in which predictors should be entered into the model. In the case of this study, the literature reviewed did not mention the importance of each predictor to warrant a hierarchical regression technique.

Before running the analysis, data cleaning was performed to get rid of errors and check for missing values. The study utilized the most commonly used methods of checking data, namely, descriptive statistics, scatter plots, and histograms. Descriptive statistics were run several times checking the resulting minimum and maximum values and comparing the values with the ones in the data. If items were found to be above maximum or minimum values, original questionnaires were rechecked to ensure the resulting discrepancies were not attributable to coding or data entry. Moreover, cases that were missing some items were dropped from analysis. Analysis was also performed with all data, that is, cases with missing data and cases without missing data, to assess whether
the analysis resulted in different findings. This study utilized standardized Z scores tests. The tests were performed to check data for extreme values.

Statistical assumptions guiding the use of multiple regression techniques were considered and tested before performing data analysis in the study. When the assumptions are violated, the generalizability of the findings is inadequate. The assumptions were tested using normal distribution curves, box plots, and scatter plots.

*Pilot Study Findings*

The questionnaire was pilot tested to ensure that the constructs or questionnaire items addressed what was intended to be measured and to ensure the general clarity of the questions. The questionnaire was pilot tested to students in a Midwestern university taking online classes.

From results of the pilot study performed, Cronbach’s alpha for perceived social presence scale was 0.93 with number of items in the scale = 14. This indicated that the scales items had internal consistency. The Cronbach’s alpha for the scales of facilitation, involvement, course design, community size, and affective responses were 0.917, 0.943, 0.726, 0.916, and 0.856, respectively.

The pilot test results further revealed questions that needed to be reassessed because they were left blank or because the items had negative values under corrected-item total correlation when reliability analysis were performed. No comments were given by respondents in the case of items left blank. The researcher assumed that the items might have been misunderstood, miswritten, or miscoded. The items were refined before the final instrument was sent out.
CHAPTER FOUR: Data Analysis Results

In this chapter, results of research analysis of the data collected from postsecondary learners enrolled in an online learning environment in a large Midwestern university are presented. Divided into three sections, the first section of the chapter presents results on background information of respondents. These included level of computer expertise, number of postings respondents made per week on the discussion board, information on the ease or difficulty of using technology to participate in online learning, respondents’ educational experiences participating in online learning, and information on whether respondents will email the people they met and interacted with during the course.

Results of reliability and correlations of independent variables (involvement, facilitation, affective responses, course design, age, gender, and community size) with the dependent variable are presented in the second part of this chapter. This is followed by results of the data analysis performed on the collected data to answer the following research questions:

1. Do affective responses, facilitation, involvement, gender, age, community size, and course design predict social presence in postsecondary learners enrolled in online learning environments?

2. Which of the predictor(s), involvement, facilitation, affective responses, course design, gender, age, and community size, is/are more important in predicting social presence in postsecondary learners enrolled in an online learning environment?
The fourth section of the chapter presents results of various assumptions for regression analysis and assessment of whether the data collected met or violated any of the assumptions. Results of supplemental analysis performed on data are also presented in this chapter.

Findings

The questionnaire items used to collect data from respondents were divided into nine parts, namely, items on general background information, involvement, facilitation, affective responses, course design, community size, gender, age, and perceived social presence. There were a total of 79 items on the questionnaire distributed as follows: 14 items measured social presence, 12 items measured involvement, 8 items related to affective responses, 5 items related to community size, 10 items related to facilitation, 8 items measured course design, 7 items were related to respondents’ general background information, and age and gender were stand-alone variables. The data collected were analyzed using Statistical Package for Social Scientists (SPSS) versions 14.0 and 13.0. SPSS version 13.0 was used to examine missing data.

The internal consistency and reliability of the scales (social presence, facilitation, involvement, affective responses, course design, and community size) were tested. The internal consistencies of the scales were assessed using Cronbach’s alpha, and they were social presence = 0.956, facilitation = 0.917, affective responses = 0.876, course design = 0.916, community size = 0.766, and involvement 0.943. This shows that items in the scales had high internal consistency.

A total of 218 of the 900 students sampled responded to the online questionnaire. This represented a response rate of 24%, which was 52% higher than the determined
minimum sample of 114 needed for the study, derived in chapter 3 of this document. From the total of 218 responses received, 45 cases had one to four items missing. The researcher decided to use all the cases by analyzing missing cases using expectation maximization method (EM) recommended by Schafer and Graham (2002).

The online questionnaire was sent to 900 students who were randomly selected (using a random generator of numbers in SPSS) from a list of 1,857 students enrolled in online learning in the spring and summer quarters of the 2005/2006 academic year in a Midwestern university.

**General/Background Information**

The results of the background information indicated that 60% of respondents had intermediate skills with regard to computer technical expertise, 6% reported that they were novices with limited technical expertise, and 34% indicated that they were experts with regard to computer technical know-how. With regard to the ease or difficulty of using technology for online learning, 66% of the respondents reported having an easy time using technology for online learning; while 1% of respondents reported having difficulties when using technology for their online learning.

It is interesting to note that 32% of the respondents reported that they had never posted any messages on the course discussion board. Another 29% reported posting messages once a week on the course discussion board. Moreover, 16%, 8%, and 15% of respondents reported posting messages twice a week, three times a week, and four or more times a week to the course discussion board, respectively.

Overall the respondents seemed to have had favorable online learning experiences. Specifically, 17% reported that their overall online learning experience was excellent,
33% reported having very good experiences, and 29% and 13% reported having had good and satisfactory online learning experiences, respectively. Another 7% of the respondents reported having poor online learning experiences.

Table 4.1 summarizes these findings.
Table 4.1

Results on Background Information

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-Categories</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Expertise</td>
<td>Novice</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>Advanced</td>
<td>75</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>Easy</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>Somewhat easy</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Difficult</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Somewhat difficult</td>
<td>4</td>
</tr>
<tr>
<td>Online Educational Experience</td>
<td>Poor</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Satisfactory</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Excellent</td>
<td>37</td>
</tr>
<tr>
<td>Weekly Rate of Messages Posted</td>
<td>Once a week</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Twice a week</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Three times a week</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Four or more times a week</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>69</td>
</tr>
<tr>
<td>Email Course Mate after the Course</td>
<td>Yes</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>168</td>
</tr>
</tbody>
</table>
Multiple Regression Analysis

Before proceeding further, it is important to note that regression analysis was performed to find out whether the coefficients on independent variables (involvement, facilitation, affective responses, course design, community size, age, and gender) were equal to or greater than zero. If the coefficients are greater than zero, then the independent variables have a genuine effect on the dependent variable. The null (default) hypothesis of the study assumed that each independent variable had absolutely no effect in predicting or explaining the perceived social presence in postsecondary learners enrolled in online learning environments.

The regression technique used to perform analysis on the data collected was the ENTER method. Under this method, all variables are entered into the analysis simultaneously by the SPSS program without the researcher deciding on the order of entry. This method was preferred because there was no previous research that indicated which predictor/independent variable was more important in predicting perceived social presence in online learning. In addition, no study was available that has determined the order in which independent variables touted to predict perceived social presence in online learning should be entered into regression analysis.

Stevens (1999) notes that the order in which predictors enter a regression equation can have a great impact on how much variance the predictors account for in the dependent variable. The order of entrance is more influential especially for predictors that are highly correlated. For uncorrelated predictors, which seldom occurs in practice, the order of entry into the regression equation does not make much of a difference (Stevens, 1999). Conceptually, predictors with the highest simple correlation with the dependent
variable enter the equation first, followed by the second highest, and so on, until all independent variables enter the model/equation. Table 4.2 provides Pearson correlations between the dependent variable and the predictors.
Table 4.2

*Pearson Correlations between Independent and Dependent Variables*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Involvement</th>
<th>Facilitation</th>
<th>Community Size</th>
<th>Affective Response</th>
<th>Course Design</th>
<th>Age</th>
<th>Gender</th>
<th>Social Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitation</td>
<td>.455**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Size</td>
<td>-.081</td>
<td>-.191**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective Response</td>
<td>.866**</td>
<td>.485**</td>
<td>-.003</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Design</td>
<td>.397**</td>
<td>.732**</td>
<td>-.278**</td>
<td>.349**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.244**</td>
<td>-.125</td>
<td>.090</td>
<td>-.233**</td>
<td>-.168*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.142*</td>
<td>-.226**</td>
<td>.080</td>
<td>-.119</td>
<td>-.188*</td>
<td>.038</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Social Presence</td>
<td>.756**</td>
<td>.607**</td>
<td>-.075</td>
<td>.771**</td>
<td>.483**</td>
<td>-.140*</td>
<td>-.173*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Correlations of the six predictors (facilitation, affective responses, involvement, course design, community size, age and gender) with social presence, the dependent
variable, are shown in Table 4.2. The Pearson correlation between affective responses and social presence was 0.771, the highest among the seven independent variables. Because of the high correlation with the dependent variable, affective response was expected to enter the equation first. However, this does not happen because of the ENTER method, chosen for this study. In this method, as already mentioned, all independent variables enter into the model irrespective of the sizes of their Pearson correlations with the dependent variable, social presence. The bivariate correlations of involvement, facilitation, course design, community size, age, and gender with perceived social presence were 0.756, 0.607, 0.483, -0.075, -0.140, and -0.173, respectively.

**Fear of Multicollinearity**

Multicollinearity is a problem that occurs when predictors are highly correlated so much so that they account for or explain almost the same amount of variance in the dependent variable. This makes it exceedingly difficult to determine which predictor is most important in explaining the variance in the dependent variable. Multicollinearity may result, particularly for small and moderate sample sizes, in lack of statistical significance of individual independent variables, while the overall model may be strongly significant. Multicollinearity may also result in wrong signs and magnitudes of regression coefficient estimates, and, consequently, in incorrect conclusions about relationships between independent and dependent variables.

One of the simplest methods for diagnosing multicollinearity is checking the values of Pearson correlations summarized in Table 4.2. The Pearson correlation values show the pairwise relationships between variables; that is, the relationship between each pair of independent variables as well as the dependent variable. From Table 4.2, the
highest Pearson correlation was between affective responses and involvement, which was significant at \((R = 0.866, P < 0.01)\). This coefficient is very large, greater than the absolute value of \(|0.80|\) sending serious signal of a possible collinearity problem between affective responses and involvement. The correlation between facilitation and course design is equally high and significant \((R = 0.732, P < 0.01)\). Despite the significance of this correlation, it is less than the absolute value of \(|0.80|\) normally associated with variables that are strongly interrelated.

To confirm results of Pearson correlations and ensure that multicollinearity was not a cause for great concern in the study, other robust techniques (tolerance and variance inflation factor) were used to detect presence of multicollinearity. Menard (1995) suggests that tolerance below 0.1 indicates a serious problem. On the other hand, tolerance below 0.2 indicates a potential problem. On variance inflation factor (VIF), Myers (1990) and Bowerman and O’Connell (1990) observe that there is cause for concern when the largest variance is greater than 10. From the findings in Table 4.3, the VIF values are all below 10, and the tolerance statistics are all above 0.2. In spite of the high Pearson correlations between affective responses and involvement, and between facilitation and course design, we can conclude that there was no collinearity within the model.
Table 4.3

*Diagnosis of Multicollinearity*

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>Involvement</td>
<td>0.234</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0.393</td>
</tr>
<tr>
<td>Community Size</td>
<td>0.898</td>
</tr>
<tr>
<td>Affective Responses</td>
<td>0.226</td>
</tr>
<tr>
<td>Course Design</td>
<td>0.426</td>
</tr>
<tr>
<td>Age</td>
<td>0.925</td>
</tr>
<tr>
<td>Gender</td>
<td>0.944</td>
</tr>
</tbody>
</table>

*R-Squared and Overall Significance of the Regression*

The R-squared of the regression is the fraction of the variation in the dependent variable that is accounted for or predicted by independent variables. In regression with a single independent variable, R-Squared is the same as the square of the correlation between the dependent and independent variable. The $P$ value tells how confident one can be that independent variables have a linear relationship with the dependent variable and whether the derived regression model either significantly or otherwise predicts the dependent variable.

Results of regression analysis presented in Table 4.4 indicate that the full regression model, with combined predictors (involvement, facilitation, affective...
responses, gender, age, community size, and course design) was significant in predicting perceived social presence, with $R = 0.834$, $R^2 = 0.695$, $Adjusted R^2 = 0.685$, $F (7, 210) = 68.379$, $P < .05$. $R = 0.834$ shows the multiple correlation coefficient between the combined predictors and the dependent variable. The combined predictors accounted for 0.695 in predicting social presence depicted by $R$ Square ($R^2$). This is interpreted as 69.5% of variance in social presence was accounted by involvement, facilitation, affective responses, gender, age, community size, and course design. The value of $Adjusted R^2 = 0.685$ indicates the amount of variance explained by the predictors when the model is applied to another sample in the same population. There was a small drop of 0.01 or 1% in validating the model depicted by the difference between $R^2$ and $Adjusted R^2$. The small difference showed that the validation of the model was good.

Table 4.4

**Summary of Regression Model**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Change</th>
<th>Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.834</td>
<td>0.695</td>
<td>0.685</td>
<td>0.695</td>
<td>7</td>
<td>210</td>
<td>.000</td>
</tr>
</tbody>
</table>

*Contributions (Effects) of Independent Variables on the Dependent Variable*

In simple or multiple linear regression analysis, the size of the coefficient for each independent variable (predictor) gives the size of the effect or contribution that variable
has on the dependent variable. In regression with a single independent variable, a positive or a negative coefficient shows how much the dependent variable is expected to increase or decrease, respectively, when the independent variable increases or decreases by one. With multiple independent variables like the case of the current study, the coefficients explains how much the dependent variable is expected to increase when that independent variable increases by one, holding all the other independent variables constant.

The second research question (Q2) asked:

Which of the predictor(s) involvement, facilitation, affective responses, course design, gender, age, and community size is/are more important in predicting social presence in postsecondary learners enrolled in an online learning environment?

To answer this, we look at the reported contributions (Table 4.5) made by each predictor and decide which one accounts for most variance in the dependent variable based on either part or partial correlations. Part or semipartial correlation is that correlation between each predictor and part of the dependent variable that is not explained by the other predictors in the model. In other words, part correlation measures the unique relationship between the predictors and the dependent variable. Partial correlation, on the other hand, is correlation between each predictor and the dependent variable, controlling for all other predictors in the model (Field, 2000). According to Field (2000), either part correlation or partial is good for assessing the contribution of predictors in the model. The researcher used partial correlation.

It is evident from the findings presented in Table 4.5 that the null hypothesis for research question 2, which stated that:
H₀: β₁ = β₂ = β₃ = β₄ = ....... = βₖ = 0

Where β₁...... βₖ, are the coefficients of predictors

Involvement, facilitation, affective responses, course design, community size, age, and gender had the same effect on perceived social presences of postsecondary learners enrolled in online learning environments, is untenable.

The alternative hypothesis:

Hₐ: Not all β are = 0

That is, involvement, affective responses, facilitation, course design, community size, gender, and age had different effects on perceived social presence of postsecondary learners enrolled in online learning environment, is accepted. Table 4.5 presents the results in detail.
Table 4.5

*Coefficients of Independent Variables*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Correlation</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>Part</td>
<td>Partial</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-0.417</td>
<td>0.309</td>
<td>-1.350</td>
<td>0.178</td>
<td></td>
</tr>
<tr>
<td>Involvement</td>
<td>0.286</td>
<td>0.073</td>
<td>0.308</td>
<td>0.261</td>
<td>3.914</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0.261</td>
<td>0.064</td>
<td>0.247</td>
<td>0.270</td>
<td>4.066</td>
</tr>
<tr>
<td>Community Size</td>
<td>0.011</td>
<td>0.043</td>
<td>0.011</td>
<td>0.018</td>
<td>0.264</td>
</tr>
<tr>
<td>Affective Responses</td>
<td>0.418</td>
<td>0.089</td>
<td>0.376</td>
<td>0.308</td>
<td>4.690</td>
</tr>
<tr>
<td>Course Design</td>
<td>0.062</td>
<td>0.062</td>
<td>0.059</td>
<td>0.069</td>
<td>1.003</td>
</tr>
<tr>
<td>Age</td>
<td>0.033</td>
<td>0.021</td>
<td>0.063</td>
<td>0.109</td>
<td>1.596</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.048</td>
<td>0.091</td>
<td>-0.021</td>
<td>-0.037</td>
<td>-0.533</td>
</tr>
</tbody>
</table>

From the results in Table 4.5, and considering the partial correlation values and their significance (Sig.), it is clear that affective responses, facilitation, and involvement are significant and important predictors in predicting perceived social presence in postsecondary learners enrolled in online learning environments. Community size,
course design, age, and gender, on the other hand, are not significant on their own in predicting social presence.

The values of partial correlations in Table 4.5 indicate that affective responses ($t = 4.690$, $p = 0.000$) had the highest partial correlation value of 0.308 among all the predictors, and was the most important in accounting for social presence in postsecondary learners. Based on this partial correlation value, it means that affective response on its own accounted for 30.8% of variance in perceived social presence of postsecondary learners enrolled in online leaning environment.

The second most important predictor was facilitation. From the partial correlation values, facilitation accounted for 27% ($t = 4.066$, $p = 0.000$) of the variance in perceived social presence of postsecondary learners enrolled in an online learning environment. Involvement was the third most important predictor. Given its partial correlation value of 0.261 ($t = 3.914$, $p = 0.000$) in Table 4.5, involvement accounted for 26% of variance in perceived social presence.

**Regression Equation**

Despite the overall significance of the regression model as presented in Table 4.4, $F(7, 210) = 68.379$, $p < 0.05$, not all the seven predictors in the study were used to derive the regression equation. Out of the seven predictors, only three predictors, affective response, facilitation, and involvement, were important and significant in predicting social presence in postsecondary learners enrolled in online learning. A regression equation was built from these three predictors.

The unstandardized and standardized regression coefficients were used to build the regression equation. The coefficients represent the weights of each predictor in the
model. Generally, regression equation takes the form of $\hat{Y} = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \ldots + \beta_n$

where $\hat{Y}$ is the predicted value, $\beta_0 = \text{constant}$, $\beta_1$......$\beta_n = \text{coefficient of predictors}$ and $n$ is the number of predictors. From the findings reported in Table 4.4, the regression equation for this study using unstandardized regression coefficients was as follows:

$\hat{Y}$ (Predicted perceived social presence) = -0.417 + 0.286 (involvement) + 0.261 (facilitation) + 0.418 (affective response)

The use of unstandardized regression coefficient in building regression equation does not take into account the inequality of scales used to measure independent variables. Because of this short coming, the researcher opted to use the standardized regression coefficient to develop the regression equation. Based on standardized regression coefficients, the regression equation was derived as follows:

$\hat{Y}$ (predicted perceived social presence) = 0.308 (involvement) + 0.247 (facilitation) + 0.376 (affective response)

An examination of the regression equation indicates that the three predictors, involvement, facilitation, and affective response, have a positive effect on perceived social presence. In other words, as facilitation becomes more effective, social presence among postsecondary learners enrolled in online learning increases. At the same time, as more and more affective responses are posted or used by postsecondary learners enrolled in online learning environments, social presence among the same group increases. As postsecondary learners enrolled in online learning environments become more involved in and with activities and with each other, social presence increases.
Regression Model Validation

The validation of the derived regression model is pertinent in order to determine whether regression equation/model holds in the wider population from which the sample was drawn. In this study, the validation of the model was done by assessing the value of adjusted $R^2$. The adjusted $R^2$ value indicates the shrinkage or loss of predictive power. That is, it indicates how much variance in the dependent variable would be accounted for when the model is applied to another sample drawn from the wider population from which the original sample was taken.

The adjusted $R^2$ reported by SPSS was 0.685 (Table 4.4). Based on the value of $R^2$ (R squared) of 0.695 and adjusted $R^2$ of 0.685 reported in Table 4.4, the shrinkage or loss of predictive value of the model was 0.010, or 1%, a small drop. The small drop/shrinkage between the $R^2 = 0.695$ and the adjusted $R^2 = 0.685$ supports the cross validation of the predictive equation for a wider population from which the sample was drawn. SPSS derives the adjusted $R^2$ value using Wherry’s equation, which has been criticized because of its shortcomings in telling how well the regression model would predict scores of a different sample of data from the same population. To overcome this shortcoming, Stevens (1996) has recommended the use of Stein’s formula, stated as:

$$\text{Adjusted } R^2 = 1 - \left[ \frac{1}{n} - \frac{1}{k} \right] \left[ \frac{2}{n} - \frac{2}{k} \right] \left[ \frac{1}{n} \right] \left(1 - R^2\right)$$

Where $R^2$ is the unadjusted value from the SPSS output, n is the number of cases or sample size. In this study, there were 218 subjects and k is the number of predictors; in the case of this study there were seven. The Stein’s formula provides a restrictive or a conservative test for shrinkage. From the formula, the Stein value for adjusted $R^2$ is 0.0673. Based on the value of $R^2$ (0.695) and the calculated Stein’s adjusted $R^2$ value
(0.0673), the shrinkage or loss of predictive value of the model is 0.022. This is a small shrinkage, which means that the cross validation of the prediction equation to an independent sample from the same population is tenable and supported.

**Outliers and Influential Cases**

To guarantee the accuracy of the derived regression model (prediction equation), data were examined to determine whether there were outliers or influential points that might have influenced the generation of the regression model (equation). An influential point is a single or multiple points that may have significant/big influence on a prediction equation.

There are various statistical techniques used to assess outliers or influential cases. This studied utilized Cook’s distance, standardized residuals, and leverage/hat value statistics to evaluate presence of outliers or influential points. Cook distance is a measure of the overall influence of a case on the regression model (Field, 2000). It is one of the most useful and recommended methods of assessing influential points. Stevens (1999) recommends a Cook’s distance of less than 1. When Cook’s distance is greater than 1, then the point is considered influential. Cook and Weisberg (1982) have also suggested that values of greater than 1 may be cause for concern. An examination of Cook’s distance statistics indicates that none of the cases has a Cook’s distance greater than 1. So, we can confidently conclude that none of the cases had undue influence on the model.

Leverage, or what is commonly called hat values, can also be employed to assess the influence of the observed value of the outcome variable over the predicted values (Field, 2000). The average value is defined as \((k+1)/n\) giving an average value of 0.0367, where \(k\) is the number of predictors in the model, and \(n\) the number of cases/subjects.
Leverage values lie within a range of between 0 and 1, with 0 indicating that the case has no influence and 1 indicating the case has significant influence over the prediction. Stevens (1996) recommends using three times the average $[3(k+1)/n]$ as a benchmark for delineating cases that have undue influence on the model. Steven’s recommendation results in an average leverage value of 0.1101 for the case of this study. A closer screening of the leverage values reveals that all the cases had leverage values of less than 1, with most, except for cases 41, 54, and 191, lying within three times the average value of 0.0367. None of these three cases was deleted because Stevens (1996) advises:

If a point is a significant outlier on Y, but its Cook’s distance is less than 1, there is no real need to delete that point since it does not have a large effect on the regression analysis. However, one should still be interested in studying such points further to understand why they did not fit the model. (p. 118)

It is also important to note that cases with large leverage values do not necessarily have a large impact on regression coefficients because they are measured on the dependent variables rather than the independent variables.

Field (2000) observes that in a normally distributed sample, 95% of standardized residuals, on average, should lie between -2 and +2 standard deviations of the mean, and 99% should lie between -2.5 and +2.5 standard deviation of the mean. Any standardized residuals with absolute values greater than 3 are cause for concern. This is so because in an average sample a value this high is unlikely to happen by chance (Field, 2000).

Checking the Assumptions of Regression

For the derived regression model to generalize and enable the researcher to draw accurate conclusions about the population based on regression analysis performed on the
sample, pertinent underlying assumptions must be examined, tested, and met. When these assumptions are violated, the generalizability of the regression model developed in this study to another population of interest is put into question. The assumptions of linearity, independence, homoscedasticity, normality, and collinearity were examined by the researcher.

The assumption of linearity implies that the mean values of the dependent variable for each increment of the independent variable (predictor) lie along a straight line (Field, 2000). That is, the relationship between the dependent variable and independent variable is linear. The assumption of independence implies that each value of the dependent variable comes from a different subject; that is, the subjects are responding independent of each other. This assumption was met through the random selection of the cases included in the sample from the population. The assumption of homoscedasticity implies that the residuals at each level of the predictor(s) should have the same variance (Field, 2000). The normality assumption implies that the difference between model and the observed data are mostly zero or very close to zero, and the differences greater than zero happen only occasionally (Field, 2000). The assumption of collinearity means that independent variables (predictors) should not be highly correlated. The assumption of collinearity was met as discussed under the earlier section, Fear of Multicollinearity.

The Assumption of Normality

Normality assumption was checked by the use of histograms of standardized residuals and normal probability plot of the data presented in Figures 4.2 and 4.3.
Figure 4.2. Histogram of the difference: Indicates the normality of dependent variable
The Plot for Assessing the Assumption of Normality

Dependent Variable: Social Presence

Figure 4.3. The Q-Q plot for assessing the assumption of normality

The Assumptions of Linearity and Homoscedasticity

The graph of ZRESID AND ZPRED (Figure 4.4) was used to test the assumption of linearity. If the assumption is met, the graph should look like a random array of dots evenly dispersed around zero (Field, 2000). On the other hand, if this graph funnels out, then there is heteroscedasticity in the data.
Figure 4.4. Scatter plot for regression assumptions: Linearity, normality, and homoscedasticity.

From Figure 4, the points are randomly and evenly dispersed. It indicates that the assumptions of linearity and homoscedasticity were met by the data.

Further Supplementary Analysis and Findings

This section presents results of supplemental analysis performed on the collected data that the researcher thought was important in enhancing further understanding of social presence in online learning in the study. The researcher was curious about what
data on background information of respondents would add to the findings of the study. The researcher was also curious to find out whether other methods of multiple regression analysis, namely, STEPWISE (Forward and Backward methods), would yield similar predictors of perceived social presence in postsecondary learners enrolled in online learning as ENTER (Forced Entry), the method used to answer the main research questions of the study.

Based on the background information provided by the respondents, the researcher was interested in finding out the following:

1. Whether the level of computer expertise had any impact on perceived social presence.
2. Whether the overall educational experiences in taking the course had any impact on perceived social presence.
3. Whether the number of times one posted messages on the discussion board had any impact on perceived social presence.

**Stepwise Regression Analysis**

In stepwise regression methods (Stepwise and Backward), the order in which predictors are entered into the model is determined by a mathematical criterion. In the Stepwise method, the predictor with the highest simple correlation with dependent variable and which significantly improves the ability of the model to predict the dependent variable enters or is retained in the model first. The process is continued until all significant predictors are entered into the model.
The findings of Table 4.6 indicate that affective response, the only predictor in model 1, had a simple correlation of $R = 0.773$ with social presence and contributed about 60% of the variance in social presence, $Adjusted R^2 = 59.5$. When a second predictor (facilitation) was added into the equation, as presented in model 2, the Pearson correlation increased to $R = 0.817$ with the two predictors, affective responses, and facilitation accounting for 66% of variance in social presence represented by $Adjusted R^2 = 0.664$. Facilitation added 7% of the variance over and above what the affective response contributed to the model represented by $R^2 Change = 0.07$ in model 2. When involvement, the third and last predictor to be included in the equation represented by model 3, Pearson correlation between affect, facilitation, involvement, and social presence rose to $R = 0.832$ with the three predictors explaining about 69% of variance in social presence, $Adjusted R^2 = 0.688$. From model 3, involvement contributed about 3% of variance in social presence over and above what affective responses and facilitation
had accounted. The other four predictors in the study (age, gender, course design, and community size) were excluded from the model. Clearly, the results of Forward regression analysis showed that affective responses, facilitation, and involvement were significant predictors of perceived social presence in postsecondary learners enrolled in online learning. This result is in agreement with the findings of the study using the Enter (Forced Entry) method.

**Backward Regression Analysis**

In Backward regression analysis method, all the predictors are placed into the model, then the significant contribution of each predictor is calculated by the computer. If a predictor does not make a statistically significant contribution to how well the model predicts the dependent (outcome) variable, it is removed from the model and the model is re-estimated for the remaining predictors. The significance value of each predictor is assessed against an established removal criterion (Field, 2000).

The findings of Backward regression (Appendix E) indicate that, in model 1 all the predictors of social presence in the study (affective responses, facilitation, involvement, course design, community size, age, and gender) were included. Model 2 has all the predictors except for community size. Based on this method of analysis, we can rightly say that community size was the least important predictor of social presence. It was the first to be dropped out of the model. The next predictor to be dropped from the model after community size was gender, followed by course design, and finally age. Three predictors, affective responses, facilitation, and involvement, were retained in the model. This finding is consistent with two earlier ones presented that utilized Forced Entry and Stepwise regression analysis methods. We can conclude that irrespective of
regression method used, affective responses, facilitation, and involvement are three significant predictors of social presence in postsecondary learners enrolled in online learning investigated in the current study.

*One-Way Analysis of Variance (ANOVA)*

One-way analysis of variance was utilized by the researcher to analyze data on background information. Precisely, the researcher was interested in answering the following questions:

1. Is there a significant difference among learners who reported different levels of computer expertise on their perceived social presence?
2. Is there a significant difference among learners who reported different educational experiences on their perceived social presence?
3. Is there a significant difference among learners, who posted messages on the discussion board different number of times on their perceived social presence?

To answer these questions, the researcher created four grouping variables, namely computer expertise, educational experiences, postings, and email to address questions one, two, and three, respectively. For question one, the grouping variable (computer expertise) was divided into three levels or groups: novice, intermediate, and expert. The grouping variable for question two (educational experiences) was divided into five groups, namely, poor, satisfactory, good, very good, and excellent. Posting, the grouping variable for question three was also divided into five groups, namely, never, once a week, twice a week, three times a week, four or more times a week.
In this analysis, the independent variables were the grouping variables for the three questions. Each grouping variable was manipulated to evaluate its effect on perceived social presence. Assumptions guiding analysis of variance (ANOVA) were addressed in the study. The assumptions are: First, observations must be random and independent samples from the population; that is, samples must be random and independent if they are to be representative of the populations. Second, the distributions of the populations from which the samples are selected are normal and third, the variances of the distributions in the population are equal.

All the assumptions were met except for the test of homogeneity of variances, commonly called the Levene test for question three (as presented in Appendix E). Because ANOVA is a robust inferential statistical test, it is least affected by the violation of some assumptions (Field, 2000). The violation of this one assumption did not affect the findings for question three. The null hypothesis for questions one, two, and three stated that there was no difference among learners in the groups. Symbolically, the null hypothesis was stated as:

$$H_0: \mu_1 = \mu_2 = \mu_3 \ldots \mu_k$$

$$H_A: \text{At least two of the } \mu_i \text{ are different, where } \mu_1, \mu_2 \ldots \mu_k \text{ are the groups.}$$

The findings of analysis performed on data to answer questions one, two, and three were examined. From Table 4.7, the findings indicated that the overall ANOVA for the test of between and within groups for question one was not significant, $F(2, 215) = 0.806, P = 0.448$. Because the $P$ value was greater than 0.05, the null hypothesis of no difference among learners with different levels of computer expertise on their perceived social presence is retained. We conclude that there was no significant effect of computer
expertise on perceived social presence among postsecondary learners enrolled in the online learning environment. A more detailed SPSS output is presented in Appendix E.

Table 4.7

Test of Between and Within Groups for Question One

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.188</td>
<td>2</td>
<td>0.594</td>
<td>0.806</td>
</tr>
<tr>
<td>Within Groups</td>
<td>158.527</td>
<td>215</td>
<td>0.737</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>159.715</td>
<td>217</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the test of between and within groups for question two, there was a significant effect of educational experiences on perceived social presence among postsecondary learners enrolled in online learning $F(4, 212) = 3.787, P = 0.005$, as presented in Table 4.8.

Table 4.8

Test of Between and Within Groups for Question Two

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>10.645</td>
<td>4</td>
<td>2.661</td>
<td>3.787</td>
</tr>
<tr>
<td>Within Groups</td>
<td>148.995</td>
<td>212</td>
<td>0.703</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>159.640</td>
<td>216</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Given that $P < 0.05$, the null hypothesis of no difference among the groups was rejected, prompting a follow up test. Tukey HSD was performed as a follow-up test to evaluate which groups were different. The results of the follow-up test indicated that there was a significant difference between the poor, satisfactory, good, and excellent groups. Looking at the findings, we can say that as the educational experiences progressed from poor to satisfactory to good, and to excellent, perceived social presence of postsecondary learners enrolled in online learning increased proportionately.

The results of between and within groups test for question three showed that there was a significant effect of the number of times learners posted on the discussion board on their perceived social presence $F (4, 213) = 16.885, P = 0.000$. See Table 4.9.

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>38.451</td>
<td>4</td>
<td>9.613</td>
<td>16.885</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>121.264</td>
<td>213</td>
<td>0.569</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>159.715</td>
<td>217</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Because the $P$ value was less than 0.05, the null hypothesis of no differences among the groups was rejected. The follow-up test, Tukey HSD, was performed, and the results yielded significant differences (as presented in Appendix E) between the never,
once a week, twice a week, thrice a week, and four or more times a week groups. We can safely conclude that as the number of times students posted on the discussion board increased from nothing to once a week to twice a week to thrice a week and to four or more times a week, their perceived social presence increased proportionately.

**Summary of the Chapter**

This chapter presented results of data analysis. The results have shown that affective responses, involvement, facilitation, age, gender, course design, and community size, when combined, were significant predictors of social presence, with a Pearson correlation value $R = 0.834$, $R^2 = 0.695$, $Adjusted \ R^2 = 0.685$, $F (7, 210) = , P = 0.000$.

Independently though, affective responses, facilitation, and involvement were the only significant predictors of social presence irrespective of the method of regression analysis employed (Forced Entry, Stepwise, or Backward).

In evaluating the contributions of the significant predictors, affective responses was the most important variable accounting for about 31% of variance in perceived social presence of postsecondary learners enrolled in online. This was followed by facilitation which accounted for 27% of variance. Involvement, the third and last most important predictor in this study accounted for about 26% of variance in perceived social presence of postsecondary learners enrolled in online learning.

The findings of the analysis of background information indicated that the level of computer expertise was not an important prerequisite for learners enrolled in online learning to experience social presence. The results have shown that the overall educational experiences accorded to students and the number of times they posted messages on the discussion board had an impact on their perceived social presence. The
results showed that as the overall educational experiences of online learners progressed from poor to satisfactory to good, and to excellent, perceived social presence of postsecondary learners enrolled in online learning increased proportionately.
CHAPTER FIVE: Conclusions and Recommendations

The previous chapter presented the findings of the study. This chapter is concerned with the summary of the research problem, discussions of the findings, implications of the findings, the conclusions of the study and the recommendations of the researcher.

Summary

This study examined the perceived social presence of postsecondary learners enrolled in an online learning environment. More specifically, the study investigated whether facilitation, affective responses, involvement, course design, community size, age, and gender significantly predicted perceived social presence in postsecondary learners enrolled in online learning environments. The study also sought to investigate the relative importance of predictors (facilitation, affective responses, involvement, course design, community size, age, and gender) in accounting for social presence in the online learning environment.

The data were collected from 900 students who were randomly selected from a list of 1,857 students enrolled in online learning in the spring and summer quarters of the 2005/2006 academic year in a Midwestern university. A total 218 of the 900 students sampled responded to the online questionnaire. This represented a response rate of 24%, which was 52% higher than the minimum sample of 114 needed for the study, as determined in chapter three.

The findings of this study showed that there was a strong positive relationship between perceived social presence, the dependent variable and the predictor variables - involvement, facilitation, affective responses, community size, course design, gender, and
age --when combined as illustrated by the significance of the regression model in Table 4.4, $R = 0.834$, $R^2 = 0.695$, $Adjusted \ R^2 = 0.685$, $F (7, 210) = 68.379$, $P = 0.000$.

Independently, community size, course design, gender, and age did not significantly predict perceived social presence in postsecondary learners enrolled in online learning in this study.

Involvement, affective responses and facilitation were crucial factors that predicted (and enhanced) perceived social presence in postsecondary learners investigated in the study. In evaluating the importance of the three significant predictors for this study, affective response had the highest contribution and/or importance in accounting for perceived social presence in postsecondary learners enrolled in online learning. This was followed by facilitation and involvement as the second and third in importance, respectively, when the Forced Entry (ENTER) method was used.

Stepwise and Backward regression methods yielded similar results in terms of significant predictors (facilitation, involvement and affective responses). There was small variation though in the relative importance of predictors. Both the Stepwise and Backward regression method indicated that facilitation had the highest contribution in accounting for perceived social presence. Facilitation was followed by affective responses, then involvement as the second and third, respectively, in explaining perceived social presence.

From the findings of the study, we might conclude that affective response, facilitation, and involvement are factors that seemed important for postsecondary learners in this study to relate, connect, share ideas and information, speak with one another, and establish relationships despite the physical separation. It can be interpreted to mean that
what is needed and important for students to feel part of the group or team online is if the students feel involved, how the online class is facilitated, and whether there are pleasant, supportive, and personable exchanges among students and between students and instructors.

Discussion

The findings of analysis performed on data collected to answer research questions are discussed in this section. The research questions were: Do affective responses, facilitation, involvement, gender, age, course design, and community size predict social presence in postsecondary learners enrolled in the online learning environment? If yes, which of the predictor variables (affective response, facilitation, involvement, gender, age, course design, and community size) was more important in predicting social presence in postsecondary learners enrolled in online learning? The results of additional further analysis performed on the collected data are also discussed.

To answer the first research question, a statistical null hypothesis stating that there was no relationship between perceived social presence (the dependent variable) and facilitation, affective responses, involvement, course design, community size, age, and gender (the predictor variables) was posted. From the results of data analysis presented in Table 4.4, the null hypothesis was rejected because the overall regression model $F(7, 210) = 68.379, p = 0.000$ was significant. Because the $P$ value was less than 0.05, we conclude that at least one or more regression coefficients was not equal to zero. The significance of the regression model in the study suggested that there was correlation between perceived social presence and facilitation, involvement, affective response, course design, community size, age, and gender when these predictors were combined,
explaining about 70% of variance in perceived social presence in postsecondary learners enrolled in online learning.

Independently, facilitation, involvement and affective responses were important in predicting or accounting for perceived social presence in postsecondary learners enrolled in online learning environments. Conversely, course design, community size, age, and gender were not important predictors of perceived social presence. This could be explained in part by the fact that social presence in general has much to do with being an affective domain.

To answer research question two, results presented in Table 4.5 indicated that the null hypothesis stating that involvement, facilitation, affective responses, course design, community size, age, and gender had the same effect on perceived social presences of postsecondary learners enrolled in online learning environments was rejected. The alternative hypothesis, that involvement, affective responses, facilitation, course design, community size, gender, and age, had different effects on perceived social presence of postsecondary learners enrolled in online learning environment, was accepted, with affective responses accounting for the highest percentage, followed by facilitation and involvement.

Affective Responses (Affective Domain)

The findings presented in Table 4.5 under partial correlations indicate that affective responses contributed about 31% of unique variance in perceived social presence of postsecondary learners enrolled in online learning. This finding is consistent with other studies where affect/affective responses have been shown to be important for students enrolled in online learning (Rourke et al., 2001; Swan, 2003). Based on these
findings, institutions of learning and those concerned with online learning should strive to encourage and provide learning environments that are face “giving” rather than face “attacking” to enhance the online learning environment.

Face “giving” and face “attacking,” as explained in theoretical framework of the study, refers to what parties say and do (in the case of this study, online) that can be interpreted as either building up and preserving or undermining the other party’s perceived sense of respect (Goffman, 1967). These communications are known respectively as “giving” and “attacking” face. The choice of words or language that protects the other person’s character and is intended to preserve the relationship gives or builds face. On the other hand, words or language that implies the other partner or party is arrogant, unremorseful, uncooperative or untrustworthy, for example, attacks the face by indicating that the speaker is not concerned with the feelings of the other party and is willing to risk loss of a relationship (Brett et al., 2007).

The “attack” of a learner’s face by instructors and colleagues can result in far-reaching consequences on the self-efficacy of the learner. Self-efficacy is defined as the individual’s belief in his or her capability to organize and execute the course of action to produce given attainments (Bandura, 1997). Complaint by Respondent 175 in the study is a classic testimony to how a facilitator, whether consciously or otherwise, can act in ways that could be interpreted as attacking faces of learners. The respondent writes,

My instructor was rude at times, yelling at us in all caps on AIM during class discussions because he thought we had not read the material. I think the yelling is immature, especially by a professor. It was definitely uncalled for. There were times when he asked a question to start a discussion, and no one would answer. I
would have read the chapter, but what he asked was many times unclear….I am shy so I don’t like to respond unless I know the answer without any confusion….There were times when someone would answer a question with some information that I found contradictory to the text and the instructor would say “ok.” I never knew if that meant, “Yes, you are correct” or “thank you for responding, I am listening, please continue…. The “yelling” of the instructor only serves to increase transactional distance and lessen social presence. Effective learning can not take place in such a tense environment. Constant negative comments directed at an individual and lack of support, whether by the instructors or course mates may serve to fuel unfavorable attitudes towards online learning and lower self-esteem.

The importance of affective responses or affective domain, as might be referred to in instructional design has been relatively neglected (Smith & Ragan, 2005) in educational practice despite the central place it occupies in learning. It is the hope of the researcher that these findings will prompt reconsideration by educators of the need to seek instructional strategies for objectives in this very important domain.

Facilitation

The findings of the present study have proved that facilitation is an important predictor of perceived social presence. From the results of regression analysis performed, facilitation accounted for 27% of variance in perceived social presence of learners enrolled in online learning. This finding brings to the fore the critical role instructors or facilitators play in the success or failure of online learning environments. The central role of instructors or facilitators in online learning is reinforced further by responses of
learners in the open-ended section of the online questionnaire where respondents were asked to provide detailed discussion of their encounters learning online. For instance, Respondent 20 candidly wrote:

Over the summer, I took two classes. One out of the two had a great instructor and his name is Boss [a pseudonym used to protect real identity of the instructor]. I could email him with a question or an issue and he would have a solution that was flexible with both of our schedules. Not only that, he always gave me good feedback on assignments. I felt like I knew him and he actually knew me. The other class is another story. In the survey I strongly disagreed because there was no communication between students and the instructor.

Clearly, these comments demonstrate what good and bad facilitation means to students. This revelation is consistent with Parker and Gemino (2001) who cautioned that without careful instructor planning, the pedagogical benefits of student interaction are less likely to occur. It is also safe to say that all aspects of a good online learning environment, such as supportive environment, collaboration, interaction, and frequent feedback, are not inherent in the online learning environment. But these aspects can be present based on facilitator roles, design, participation patterns, and involvement. It is the combination of these skills and techniques by those tasked with facilitating and designing online learning environments that will influence learners’ perception of social presence.

The findings of the present study are consistent with Brower (2003) who argues that instructors can reduce transactional distance by developing dialogue and structure that align with learners’ needs. This is affirmed by Respondent 60 who notes:
At times it seems the learning institution do not realize they are educating working adults, not newly graduated high school students. Many of the people I attend online class with are also working nearly full time and have families. I am not saying make the classes easy, just maximize learning while minimize unessential content and provide the needed material on time.

Such an observation underscores the critical role of facilitation in online classes. Poor facilitation is a recipe for heightened anxiety and uneasiness among learners in online learning. In their open-ended responses, several respondents expressed frustrations at the failure of the facilitators to present learning materials and requirements on time. A study by Conrad (2002) note that anxieties of many learners in the online learning environment seem to revolve around the fear of not receiving all the pertinent details of assignments and course organization when needed, - which is perceived by many students to mean as soon as possible. Conrad (2002) further reported that learners are pleased when their first visit to the online course provides them with all the well-organized information they need to begin their learning.

Good facilitation will determine what is appropriate for effective online learning based on content, level of instruction, and learner characteristics. Depending on the needs of different learners, this may take different forms such as increasing dialogue and developing well-structured support materials (Moore, 1993) targeted to enhance perceived social presence among learners and instructors and to lessen transactional distance. Additionally, good facilitation is critical as it ensures that learners are given equal opportunities. This calls for the recognition that the sacrifice and effort required to implement effective online learning experiences is not small and relies to a larger extent
on the creativity of instructors/facilitators. This is not to say that the resolve to be an effective online facilitator/instructor is beyond the attainable skill set of most instructors.

**Involvement**

Involvement and/or interaction was the third most important predictor of perceived social presence contributing 26% of unique variance in perceived social presence of learners. Involvement in online learning can take many different forms, such as, involvement of students with course content, commonly referred as learner-content interaction, learner-teacher interaction, and learner-learner interaction (Moore, 1989, 1990). The findings of this study have confirmed that involvement of learners through different forms of interaction is critical in the online learning environment. When learner involvement is minimal or missing altogether, learners feels lonely and sometimes completely lost because guidance and help is scarce.

While involvement/interaction was a significant predictor of social presence in the study, respondents felt that it was not being used to their satisfaction to enhance learning. For example, Respondent 167 made the following comments that were echoed by other respondents:

I did not feel I was part of a group or class. Other than seeing the student names along with their response to the weekly topics on the discussion board, I had no idea who they were and they had no idea who I was. The discussion board responses were almost all very formal. There was no sense of the individual’s personality in the responses.

This is telling and we could infer that the wide availability of online learning tools does not necessary imply its usage to enhance participation, involvement, or interaction and,
by extension, effective teaching and learning. Proserpio and Gioia (2007) support this observation and report:

In one leading European university, 170 courses during a recent session were provided with groupware tools, at the instructor’s request. Of these 170 classes, 110 had zero messages over the course of the semester (i.e., neither the instructor nor the students posted any discussion points). Of the other 60 courses, the average number of students was 100; but the average number of messages in 3 months was 50 (average ratio of messages per student, 0.5). In the mathematics course, 1500 messages were posted; in the basic management course, 150 messages were posted (one per person). Clearly, the available technology was underutilized.

Based on Respondent 167’s observation, the researcher concludes that though a wide variety of technology was available and well known by the students, nobody bothered to maximize its usage, either because of the lack of interaction between course content and support offered by other learners and facilitators or the lack of interesting items posted on forums. The researcher’s view is reinforced by the study of Brower (2003) and Piccoli, Ahmad, and Ives (2001).

Course Design

According to the findings of this study, course design is an important predictor of perceived social presence of learners enrolled in online learning environments. The Pearson correlation $R = 0.50$ between perceived social presence and course design is reasonably large and significant, as presented in Table 4.2. When other predictors, namely, affective responses, involvement, and facilitation are tested alongside course
design, the predictive power of course design is lost to the three predictors (affective responses, facilitation, and involvement). This finding not only supports prior research but also extends it. For example, Aragon (2003) suggests that social presence should be initiated through the actual design of an online course. Aragon (2003) presents different course design strategies that can facilitate the establishment of social presence, such as developing a welcoming message for the course, inclusion of student profiles in the course, incorporation of audio, limiting class size, and structuring collaborative learning activities.

The results of the present study seem to reaffirm that having the strategies suggested by Aragon as standalone do not necessarily trigger perceived social presence in online learning. The findings further suggest that those tasked with online teaching/delivering of learning should be selective in the way they tie and integrate disparate variables of online learning. The integration should be carefully planned and executed based on course content, learning context, and learner characteristics, among other factors.

While it is reasonable to argue that courses that are well organized, with clear timelines, brief introductions, clear expectations, and explanation of course outlines, well-written course notes, clear and early descriptions and establishment of group work are important contributors to positive course beginning (Conrad, 2002), the relatively high correlation between course design and facilitation found in this study cannot be overlooked. The high correlation could be attributable to the fact that course design in online learning is influenced by a number of factors, such as instructor’s philosophical orientation, instructors’ understanding of learners’ skills level, and institution and
facilitators’ capacity to provide technical and other support services. All these have to do with the facilitation of the course rather than the design per se.

Community Size

While it has been established that community size in computer-mediated environments greatly influences learning (Rice, 1994), this study found that community size on its own is not an important predictor of perceived social presence in postsecondary learners enrolled in online learning environments. This finding implies that it does not necessarily matter how many students are present in a course or program, what is important is how well the learners are managed. For students to feel part of a course, other aspects of teaching and learning, such as proper facilitation and timely and frequent feedback would need to be infused into the learning environment.

According to the theoretical framework of the study, namely, transactional distance and face theory, a small number of students can be in a course; yet, without proper facilitation, involvement, and respectful exchanges between students, learning becomes a pain and students fail to bond. On the contrary, a course with a large number of students can experience high social presence when proper facilitation, involvement, and respectful exchange are encouraged.

Hiltz and Wellman (1997) support this observation and argue that large classes or other types of large online communities do not necessarily lead to information overload and a loss of feeling “normal.” Special software tools and software-supported interaction structures and roles can aid the coordination of large online groups. In addition, dividing up larger classes into small teams with role structures that facilitate the teams’ specific
Jonassen (1996) introduces a different viewpoint and argues that when learners have a wider audience for their writing or other scholarly work, they tend to invest more effort in the process and learn more because there are more learner-learner and learner-content interactions. While this is true, it is the contention of the present study that this does not happen automatically. It requires deliberate efforts on the part of those tasked with facilitating online classes and courses to present activities that encourage such interactions.

Arriving at the exact numbers to determine optimal community size is difficult to establish because the chemistry of the community is situational and varies with learners, instructors, and content area (Rovai, 2002). Tu and McIsaac (2002) point out that the size of discussion groups exerts a major impact on online learners, especially in real-time discussions. If a larger group is necessary, Tu and McIsaac (2002) agree with Hiltz and Wellman (1997) that strategies that provide equal turn taking among the community members must be applied. The observations by Hiltz & Wellman (1997); Tu & McIsaac (2002) further serve to reinforce the findings of the present study that proper online learning is more than the numbers of learners enrolled and more to do with how the arena is facilitated.

**Gender**

The results of the data analysis indicated that gender was not a significant predictor of perceived social presence in postsecondary learners enrolled in online learning. This finding is somewhat inconsistent with other past studies. For example,
Geffen and Straub (1997), in their study of email, found that females perceived a higher social presence and usefulness, as compared to males. Other studies (Dennis, Kinney, & Hung, 1999; Skitka & Maslach, 1996; Spangler, 1995; Venkatesh & Morris, 2000) have reported differences in how men and women interact with each other and technology. The studies note that women are perceived to be more socially oriented than men as they are more aware of others’ feelings and concerned with group harmony, consensus building, and interrelationships.

Blum (1999), in her study of asynchronous computer-mediated conference (CMC), reports gender variation in contribution style, with males dominating the discussion forum and sometimes using negative comments against women. A study by Herring (1993) reveals that messages of females were punctuated with “attenuated assertions, apologies, questions, personal orientation and support,” whereas characteristics of male’s language include “strong assertions, self-promotion, rhetorical questions, authoritative orientation, challenges and sarcasm” (p. 7). These differences have prompted some researchers (Cohoon, 2001; Richardson & French, 2000) to propose what they call a “women friendly cyber-classroom.”

Other researchers (Charny, 2000; Astleitner & Steinberg, 2005) argue that the online learning environment is now more gender balanced, especially in the developed world. Astleitner & Steinberg (2005) suggest that with more women online, resulting in more women using online learning, male voices will no longer dominate. The assertion that more women are learning online (Astleitner & Steinberg, 2005) may be supported by the findings of the current study which indicated that 80% of the postsecondary learners studied were women and only 20% were men. Many possible explanations could be
advanced for the high numbers of females taking classes online. For instance, adult women could be busy juggling work with studies and other home responsibilities and so do not have time to attend traditional classes.

The insignificance of gender as a predictor of social presence could be explained by the awareness of many learning institutions that online learning environments need to be student friendly, explained in part by the 24/7 support available. This view is supported by McSporran and Young (2004) who argue that online courses need to be people friendly so that no learners are disadvantaged. The interpretation of the researcher is that whether one is male or female, he or she is theoretically exposed to the same learning environment. Another reason why gender was not significant could be attributable to the fact that as more and more institutions embrace online learning, more resources are being expended in the design and creation of online learning environments that are adaptable to learners, thus allowing diverse ways of learning. As a result, gender differences cease to be serious cause for concern because learning could easily be tailored to individual requirements.

Age

From the findings of the study, age on its own was not a significant predictor of social presence. Essentially, age is not a factor in determining whether one will experience social presence or not in online learning. As long as there is proper facilitation, involvement, affect, and holding other factors constant, a 50-year-old student is likely to experience social presence just as a 30-year-old student would. Interestingly, an examination of the Pearson correlation (presented in Table 2.2) reveals a significant inverse albeit weak relationship between age and social presence ($R = -.140, P < 0.05$).
This finding might be interpreted in different ways. One interpretation could be that the younger the learners, the higher the likelihood they will experience social presence in online learning. Another interpretation might be the younger the learners, the higher the need for social presence in online learning.

It is interesting that 60% of the respondents in the present study were between the ages of 20 and 24. This is somewhat contrary to the widely held assumption that most people taking classes online are nontraditional college-age students. A possible explanation for the high presence of this age bracket online lies in the fast adoption of technology by this group and their willingness to try out new technologies, resulting in what has been described as digital natives or the net/virtual generation. A distinguishing characteristic of this net generation is that they have grown up with and around diverse technology reflected in the noneducational social networking the learners engage in. Taking classes online is therefore a welcome option as it entails the use of tools they have grown up using and is a possible reflection of their preference for technology. The challenge is on the part of those tasked with managing online learning environment to ensure the effective use of the widely available electronic learning tools to provide useful and engaging online learning environments by addressing the present generation’s preferences for virtual media while also enabling learner-directed interactivity.

**Contributions of Findings to Theory and Practice**

So far, most of the empirical and conceptual studies investing social presence have been focused somewhat narrowly on the relationship between social presence and performance and satisfactions with online learning (Gunawardena & Zittle, 1997; Richardson & Swan, 2003; Swan, 2002). This study attempted to shift the focus and
looked at the construct itself (social presence) and how it develops and operates. The focus on “effects” of social presence, while it is important at the early stages of construct development, curtails the impact of the construct in terms of theory concerning social presence processes, as well as utilization of social presence as a teaching and learning tool.

This study has extended existing conceptual and empirical work, emphasizing what the researcher calls the effects of social presence, and presented a conceptual model that focuses on factors influencing the development and operation of social presence in online learning. This is succinctly summarized in Figure 5.1.

*Figure 5.1. Contributions of study to theory and practice.*
Suggestions for Further Research

This study found that involvement facilitation and affective indicators are important in predicting social presence and entered the regression model in that order. Further research where a hierarchical regression model is utilized should be conducted with these predictors entered into the model in this order to see what other additional predictors, which can be entered all at once, in a stepwise or hierarchical manner, and were not covered by the current study, contribute to the prediction of social presence in online learning.

There were mixed responses on students’ experiences taking classes online. What these results show is that we still have a long way to go in understanding what an ideal online class or course should entail. This calls for deeper and further research to unravel what an ideal online learning environment should encompass.

While the researcher strived to capture all the possible general/background information of learners, it was by no means exhaustive. For instance, the researcher did not include the number of years learners had taken online classes and did not determine whether learners maintained or belonged to any social networks, such as myspace.com. The researcher did not also address information pertaining to level of study (freshman, sophomore, junior, senior, graduate, and other). It would be interesting to replicate this study with such additional information to assess whether there are differences in perceived social presence as learners advance from one level to the next.
Conclusion

The study found that not all predictors/independent variables (age, gender, facilitation, involvement, affective responses, course design, and community size) were important in determining the perceived level of social presence in postsecondary learners enrolled in online learning. The research questions were answered and found out that involvement entered the equation first and contributed the most in explaining the variance in perceived level of social presence in online learning. Overall facilitation, affective responses, and involvement were the variables that entered the equation and proved significant. Every effort should be expended to address and incorporate these predictors in the design, implementation, and delivery of online learning instruction.

Recommendations

1. Problems and challenges of online learning are numerous. The investigator believes that some of the barriers could possibly be addressed. Every effort must be made to encompass or promote factors that enhance positive social presence, such as proper facilitation, involvement of learners, and affective responses to increase the effectiveness of online learning. (Some ways to do this include provision of professional development and training.) Facilitators/instructors should be trained and encouraged to consider and implement activities and factors that promote high social presence in online learning environments.

2. Big classes should have more than one facilitator attending to students’ needs and other learning challenges. To suggest more than one facilitator for large classes does not preclude the urgent need for further research to establish the optimum number of students in online learning environments that can be managed.
effectively by one facilitator. Teams of experts should be engaged to staff online learning with the instructor/facilitator acting as the content expert. Facilitators should be encouraged to assess the classes they intend to teach before rolling out the lessons; take stock of the abilities, characters, and interests of the learners with respect to course content, and design instructions aligned to learning styles of students.

3. Facilitators teaching online need to understand and if necessary, be trained on how to utilize various technological tools to enhance social presence in online learning environments. The comments of respondents in this study indicate there is less compatibility between learners’ expectations and the way facilitators deliver either because facilitators do not understand what is needed of them or they are not doing what is required of them in teaching online. There is an urgent need to redress this situation to avert disconnect between learners’ needs and the teaching preferences and styles of facilitators. It should not be lost that effective learning is attained when learning styles of learners intersect with facilitators’ teaching styles.

4. Critical questions should be posed such as “What are sound ways that social presence elements could be incorporated into teaching and learning online? “Can such methods lead to effective learning and a better understanding of online learning environment?” “How effective are the online tools, such as discussion boards, chat rooms and email, in enhancing social presence and learning?” “How can and/or should we best teach in the dynamic online learning environment?”
5. The findings of this study also brought out an important element of current online learners. That is, the element of immediacy, which means that information learners need should be available 24 hours a day, 7 days a week. This is evident by the numerous complaints reported by respondents about their facilitators who did not attend or respond to email or questions within a reasonable time. This in itself lessens social presence and extents the transactional distance between learners and facilitators in online learning.

6. The researcher underscores that many current learners understand and utilize the latest technologies to engage with peers. What is lacking is an understanding by the older generation on how best to integrate electronic learning tools in order to provide useful and engaging learning environments for current students with great preferences for technology. Every effort must be made to inculcate the older generation of faculty members with the need to embrace and integrate new technologies into their teaching to match up with the demand of the current crop of learners.
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Appendix A: Questionnaire
Questionnaire

Thank you for participating in this project. I am conducting a study on the perceptions of social presence in postsecondary learners enrolled in online learning environments. You have been identified as one of the participants to respond on issues related to your experiences in online learning environment.

The whole survey will take approximately 15 to 20 minutes of your time. Please complete all of the items. It is usually best to respond with your honest impression. All responses will be absolutely confidential.

Your participation in this project is voluntary. You may choose to withdraw at any time. By answering the questions in the survey, you are providing consent and agreeing to participate in the study.

1. How would you rate the level of your computer expertise?

Novice………. Intermediate…….. Expert…………

2. How easy or difficult was it for you to use technology to participate in the course?

Easy………. Somewhat easy……… Difficult……. Somewhat difficult…………

3. How would you rate your overall educational experience in taking this course?

Poor…….. Satisfactory………Good…………. Very good…….. Excellent…………

4. On average, how often do you or did you post messages to the discussion board each week?

Once a week………. Twice a week………. Three times a week………. Four or mores times a week……

5. The audio was sometimes incorporated in the course by the instructor.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

6. Would you email the course mate (person) you met online during the course after the program/course is over?

Yes……………. No…………….
7. The instructor for this course posted welcoming messages at the beginning of the course.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

8. Your gender: Male…………….. Female…………

9. The course involved diverse activities that allowed me to work with other course mates.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

10. I prefer to be in a large online group size during the course.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

11. I sometimes share information unrelated to the course with other students.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

12. Even though I was not physically together with my course mates in a traditional classroom, I still feel/felt like I was part of a group in the online course.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

13. Your age

(1) 20 – 24 (2) 25 – 29 (3) 30 – 34 (4) 35 – 39 (5) 40 – 44 (6) 45 – 49 (7) 50 and above

14. I freely express my values and beliefs during the course.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

15. I sometimes use informal language when communicating with course mates.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

16. My course mates share/shared their reflections of the course with me.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

17. My course mates use a lot of humor in their messages when communicating or discussing course assignments.
(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

18. Online education or web-based education is an excellent medium for social interaction.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

19. At times I openly express my agreement or disagreement with what my course mates post online.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

20. I felt comfortable conversing with online learning medium.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

21. Some sections of online learning environment enabled me to form a sense of online community.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

22. I felt comfortable participating in course discussions with others.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

23. I felt comfortable interacting with other participants in the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

24. I felt that other participants in the course acknowledged my point of view.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

25. The instructor used emotions (facial expressions created through the use of punctuation marks on the keyboard such as ☺)

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

26. I was able to form distinct individual impressions of some course participants.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree
27. The instructor created a feeling of online community.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

28. The instructor facilitated discussions well in the course.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

29. I was able to form distinct individual impressions of the instructor in the course.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

30. I felt comfortable conversing with the instructor online.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

31. My point of view was acknowledged by the instructor.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

32. The instructor provided frequent feedback.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

33. The instructor shared some personal stories and experiences during the course.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

34. The instructor for the course met my expectations.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

35. My course mates use informal language when communicating with me.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

36. I normally make my emotions known to my course mates through my choice of words when communicating.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

37. My course mates normally make their emotions known to me through their choice of words when communicating with me.
38. My course mates freely express their values and beliefs during the course.

39. I use a lot of humor in my messages when communicating or discussing course assignments with course mates.

40. I readily share my personal information, stories, and experiences with my course mates during the course.

41. My fellow students readily share their personal information, stories, and experiences during the course.

42. I acknowledge the views of my course mates during the course.

43. My course mates acknowledge my views during the course.

44. My course mates sometimes openly agree or disagree with what I post online.

45. I offer encouragements to my course mates.

46. My course mates offer encouragement or post encouraging messages during the course.
47. I freely ask my course mates questions during the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

48. My course mates freely ask me questions during the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

49. I sometimes seek elaboration and clarification from my course mates on issues related to the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

50. My course mates sometimes seek elaboration and clarifications from me on issues related to the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

51. I sometimes offer advice to my course mates on course materials.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

52. My course mates sometimes offer me advice on course-related materials.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

53. I contribute more to discussion boards than some of my course mates.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

54. Some of my course mates contribute more than me to discussion boards.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

55. I sometimes have private chats or communications with my course mates before, after, and during online class sessions.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

56. My course mates sometimes initiate private chats or communications with me before, after, and during online class session.
(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

57. I refer to my course mates by their names when discussing or communicating assignments and other course issues.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

58. My course mates refer to me by my name when discussing or communicating assignments and other course issues.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

59. I address groups in the course using inclusive pronouns such as “ours,” “us,” “we.”

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

60. My course mates address group members in the course using inclusive pronouns such as “ours,” “us,” “we.”

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

61. My course mates at times share information unrelated to the course with me.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

62. I share/shared my reflections of the course with my course mates.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

63. The instructor shared student profiles in the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

64. The instructor allowed students to share their personal profiles in the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

65. Group discussions were well structured in the course.
66. The instructor facilitated discussions in the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

67. I did not get the attention I wanted from my course mates because of many members in the group.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

68. My course mates did not receive much attention from me because I had to deal with many group members.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

69. I did not help my course mate very much because I had to read many postings.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

70. The large group size in my course allowed me to read more and post many messages to the discussion board.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

71. The small group in my course allowed me to read more and post many messages to the discussion board.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

72. I prefer to be in a small online group size during the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

73. I feel comfortable being in either a small or large online group size during the course.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

74. The course contained all the information I need/needed to learn effectively.

(1)Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree
75. Course expectations were well stated.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

76. The course information was well organized.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly Disagree

77. What did you like most about your experiences learning online?

78. What did you not like about your experiences learning online?

79. What suggestions or recommendations will you give to improve your online learning experiences?
## Variables and items measuring (implying) them in the survey

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
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<tr>
<td>Social presence</td>
<td>Items 12, 14, 18, 19, 20, 21, 24, 26, 36, 37, 38, 40, 41, 42, 43, and 44</td>
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<tr>
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<td>Items 7, 25, 27, 28, 29, 30, 31, 32, 33, 34, 63, 64, 66</td>
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<td>Affective Responses</td>
<td>Items 15, 17, 35, 39, 57, 58, 59, and 60</td>
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<td>Involvement/Interaction</td>
<td>Items 16, 22, 23, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 56, 61, 62</td>
</tr>
<tr>
<td>Course Design</td>
<td>Items 5, 9, 65, 74, 75, and 76</td>
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<tr>
<td>Community Size</td>
<td>Items 10, 67, 68, 69, 70, 71, 72, 73</td>
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<tr>
<td>Gender</td>
<td>Items 8</td>
</tr>
<tr>
<td>Age</td>
<td>Items 13</td>
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Appendix B: Letter from Institutional Review Board
A determination has been made that the following research study is exempt from IRB review because it involves:

Category 2 research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.

Project Title: An Investigation of Social Presence in Post Secondary Learners Enrolled in Online Learning Environment

Project Director: Lewis Chongwony

Department: Educational Studies

Advisor: Teresa Franklin

Robin Stack, Human Subjects Research Coordinator
Office of Research Compliance

The approval remains in effect provided the study is conducted exactly as described in your application for review. Any additions or modifications to the project must be approved by the IRB (as an amendment) prior to implementation.
Appendix C: Letters Seeking Permission to Use Copyrighted Materials
March, 29 2007

Dear Dr. Garrison,

My name is Lewis Chongwony, a doctoral candidate at Ohio University, Athens, USA. I am emailing you to seek your permission to use your Community of Inquiry Model as it is in my study.


As I was reviewing the literature on the topic, I came across your Community of Inquiry Model. Your model is very relevant to my study and I would like to incorporate it in my literature.

Thanks in advance for your very kind gesture.

Yours Sincerely,

Lewis Chongwony
April, 4 2007

Dear Prof. Gunawardena,

My name is Lewis Chongwony, a doctoral candidate at Ohio University, Athens, USA. I am emailing you to seek your permission to adapt your Global Education Questionnaire in my study.

I am working on my dissertation, Investigating Social Presence in Post Secondary Learners Enrolled in Online Learning Environment. As I was reviewing the literature on the topic, I came across one of your articles containing the questionnaire. Some items in your Global Education Questionnaire are very relevant to my study and I would love to adapt them with your consent.

Thanks in advance for your very kind consideration and I look forward to hearing from you.

Yours Sincerely,

Lewis Chongwony
April, 4 2006

Dear Dr. Swan,

My name is Lewis Chongwony, a doctoral candidate at Ohio University, Athens, USA. I am emailing you to seek your permission to use the revisions you made to Rourke, Anderson, Garrison and Archer (2001)’s Model and Template for Assessing Social Presence contained in one of your articles “Building Communities in Online Courses: The Importance of Interaction.”

I am working on my dissertation, Investigating Social Presence in Post Secondary Learners Enrolled in Online Learning Environment. As I was reviewing the literature on the topic, I came across your great articles on the same (Social Presence). Your work is very relevant to my study, especially the one indicated above, and would like to incorporate it in my literature with your consent.

Thanks in advance for your very kind consideration and I look forward to hearing from you.

Yours Sincerely,

Lewis Chongwony
I would be honored to have you use my work.

Karen Swan
Research Center for Educational Technology
321 Moulton Hall
Kent State University
Kent, OH 44242
330-672-3317; FAX 330-672-5834

----- Original Message ----- 
From: lc291202@ohio.edu
Date: Monday, April 9, 2007 3:21 pm
Subject: Re: Permission to Use Your Work
To: kswan@kent.edu

> Dear Dr. Swan,
> 
> My names are Lewis Chongwony, a doctoral candidate at Ohio
> University, Athens,
> USA. I am emailing you to seek for your permission to use the
> revisions you
> made to Rourke, Anderson, Garrison and Archer (2001) Model and
> Template for
> Assessing Social Presence contained in one of your articles
> (Building
> Communities in Online Courses: The Importance of Interaction).
> 
> I am working on my dissertation, Investigating Social Presence in
> > Secondary Learners Enrolled in Online Learning Environment. As I
> was reviewing
> the literature on the topic, I came across your great articles on
> the same
> (Social Presence). Your work is very relevant to my study,
> especially the one
> indicated above and would like to incorporate it my literature
> with your
> consent.
> 
> Thanks in advance for your very kind consideration and I look
> forward to
> hearing from you.
> 
> Yours Sincerely,
> 
> Lewis Chongwony.
Appendix D: SPSS Output: Regression Analysis
### Descriptive Statistics

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Variables Entered/Removed(b)

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a All requested variables entered.
b Dependent Variable: SocialPres

Model Summary(b)

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a Predictors: (Constant), Gender, Age, CommunitySize, AffectiveResponses, CourseDesign, Facilitation, Involvement
b Dependent Variable: SocialPres
ANOVA(b)

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a Predictors: (Constant), Gender, Age, CommunitySize, AffectiveResponses, CourseDesign, Facilitation, Involvement
b Dependent Variable: SocialPres

Coefficients(a)

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a Dependent Variable: SocialPres
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a  Dependent Variable: SocialPres
Histogram

Dependent Variable: SocialPres

Frequency

Mean = 3.63E-15
Std. Dev. = 0.984
N = 218
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: SocialPres
Graph
Stepwise Regression Analysis

Descriptive Statistics

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Correlations

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Dependent Variable: SocialPres
Backward Regression

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a Dependent Variable: SocialPres
Appendix E: SPSS Output: Analysis of Variance (ANOVA)
### Analysis of Variance Output

Whether there is Significant Difference between Computer Expertise and Social Presence

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Test of Homogeneity of Variances

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**SocialPres**

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### Post Hoc Tests

#### Multiple Comparisons

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Whether there is Significant Difference between Educational Experiences and Social Presence

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ANOVA

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Whether there is Significant Difference between Number of Times of Postings and Social Presence

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Test of Homogeneity of Variances

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### Post Hoc Tests

**Multiple Comparisons**

**Dependent Variable: SocialPres**

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<p>| Twice a week   | Once a week         | -.3065579             | .1596973   | .310  | -.745931 | .132815      |
|                | Twice a week        |                      |            |       |         |              |
|                | Three times a week  | .1220786              | .2241286   | .982  | -.494564 | .738721      |</p>
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* The mean difference is significant at the .05 level.