

ABSTRACT

THOMAS, AMANDA GARLAND. The Relationships Between Students' Use of Instant Messaging and Their Psychological Sense of Community. (Under the direction of Joy Gaston Gayles, Ph.D.).

The purpose of this study was to understand the extent to which students' psychological sense of community was influenced by IM use using the psychological sense of community theoretical framework created by McMillan and Chavis (1986), and the student development theoretical frameworks created by Schlossberg (1989) and Astin (1984). Thus, this study examined the relationships between the use of IM, psychological sense of community, age, gender, race, classification, college, residential status, permanent address, involvement in activities, and sense of mattering.

Differences in IM use were examined using chi-square and analysis of variance. Results indicate that white students use IM more as compared to minority students and students who live off campus use IM more than students who live on campus. Students who work part-time on or off campus use IM less frequently and for shorter periods of time as compared to students who do not work part-time. In addition, minority students are less likely to use IM to communicate with classmates as compared to white students.

Psychological sense of community was explored through a blocked, hierarchical multiple regression model. The results of the final model indicate that student demographic variables are not significant predictors of psychological sense of community whereas student participation in intramural/club sports, a sense of mattering to others, and use of IM, particularly when using IM to speak with family and friends at NC State, are influential to

psychological sense of community. In other words, what students do on campus, rather than who they are, seems to have the most influence on psychological sense of community with the university as a whole.

The study presents implications and suggestions for future research. The differences in IM use among students should prompt educators to closely monitor trends in technology with the caveat of how these technologies are impacting student development for different types of students. College administrators must continue to find avenues to promote students' psychological sense of community understanding that community may have a new meaning for incoming undergraduate students. Future research should include direct observation of IM use, qualitative analysis, and continued examinations of evolving communication technologies.

The Relationships Between Students' Use of Instant Messaging and
Their Psychological Sense of Community

by
Amanda Garland Thomas

A dissertation submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the Degree of
Doctor of Education

Higher Education Administration

Raleigh, North Carolina

2009

APPROVED BY:

Diane Chapman, Ed.D.

Brad Mehlenbacher, Ph.D.

Audrey J. Jaeger, Ph.D.

Joy Gaston Gayles, Ph.D.
Chair of Advisory Committee

BIOGRAPHY

Amanda Garland Thomas was born in Gainesville, Florida, but spent most of her childhood in Clinton, NY. She graduated from Hobart William Smith Colleges in 1996 with a B.A. in Comparative Literature and a minor in Spanish. She began her career as a professional tennis instructor where she realized how much she enjoyed coaching and helping people achieve their goals. She got her first taste of the opportunities within higher education at the University of North Carolina at Chapel Hill as the internship coordinator for Health Administration within the School of Public Health. She explored life in corporate America by working at Cisco Systems, Inc. as a recruiting events coordinator. After the dotcom bust in 2001, she returned to higher education and worked at Colgate University as an assistant career counselor in charge of recruiting and assisting health science majors. It was her experiences at Colgate that solidified her love for students and student affairs.

In 2003, Thomas began her studies at North Carolina State University. She received her Master's of Education degree in the field of Higher Education Administration in 2005 and continued on in the doctoral program. She has worked in the Division of Student Affairs for the past six years as a graduate assistant in the Distance and Technological Services office. Her supervisor, Leslie Dare, Ed.D., encouraged her, as well as other student affairs practitioners, to become more involved in exploring technology's role in students' lives. Thomas looks forward to working hands-on with students and administrators to develop strategies for incorporating technology, as it evolves, into learning and community building.

Thomas lives in Efland, NC with her gaggle of Scottish Terriers and other assorted wildlife. While not caring for them, she works on expanding her business, Painted Pooches.

ACKNOWLEDGMENTS

I would like to thank all of those people who helped make this dissertation possible. First, I would like to thank Joy Gaston Gayles, Ph.D., my committee chair for her countless hours of reflecting, reading, encouraging, and most of all patience throughout the entire process. Also, I would like to thank my committee members Brad Mehlenbacher, Ph.D., Diane Chapman, Ed.D., Audrey Jaeger, Ph.D for their very helpful insights, comments and suggestions as well as Paul Umbach, Ph.D. for his input at my final meeting.

To Leslie Dare, Ed.D., I could not have done any of this without you. From planning power meetings to my mock oral defense, you never let me think for one minute that I couldn't do this. To Carrie Zelna, Ph.D., thank you for all of your statistical expertise and reassuring me that I knew what I was talking about when I wasn't so sure. To Lisa Zapata, Ph.D., thank you for helping me navigate this topic and giving me definitive answers when it seemed to me like there were none. To Nancy Whelchel, Ph.D., thank you for your help with formulating my survey and pointing me in the right direction. And to the members of the Vice Chancellor for Student Affairs office, Dr. Tom Stafford, Ph.D., Nancy Jenkins, and Sandy Jones, thank you all for your encouragement and patience with me throughout the years!

To my family and friends, thank you for listening to all of the crazed phone calls and reading the convoluted emails throughout this past year. You were more confident in me than I was in myself. I would not have pushed through without your constant validation!

TABLE OF CONTENTS

LIST OF TABLES	vi
CHAPTER 1: INTRODUCTION	1
Statement of the Problem	3
Conceptual Framework	7
Purpose of the Study.....	9
Research Questions	9
Definition of Terms.....	10
Significance of the Study.....	13
CHAPTER 2: REVIEW OF THE LITERATURE	14
Concept of Community	14
Psychological Sense of Community	16
Universities as Communities	18
Virtual Communities	21
Loss of Community	23
Technology in Higher Education	25
Millennials and Higher Education.....	25
Instant Messaging.....	27
Conceptual Framework	37
Astin’s Theory of Involvement.....	37
Schlossberg Marginality and Mattering.....	39
General Sense of Mattering Scale	41
McMillan and Chavis’ Psychological Sense of Community	42
Psychological Sense of Community in Education.....	46
Collegiate Psychological Sense of Community Scale	48
Summary.....	51
CHAPTER 3: METHODOLOGY	52
Research Design.....	52
Population and Sample	53
Instrumentation	53
Collegiate Psychological Sense of Community Scale.....	54
General Sense of Mattering Scale	55
Activities and Student Characteristics.....	55
Instant Messaging Usage	56
Data Collection	57
Data Analysis.....	59
Dummy Coding.....	60
Limitations.....	61
CHAPTER 4: RESULTS	62
Descriptive Findings.....	62
Data Analysis	66
Reliability.....	67

Results - Research Question 1.....	70
IM Use.....	71
IM Frequency of Use.....	73
IM Duration of Use.....	76
IM Number of People.....	78
IM Types of People.....	81
Results - Research Question 2.....	85
CHAPTER 5: DISCUSSION.....	92
Directions for Future Research.....	97
Implications.....	97
Summary.....	101
REFERENCES.....	102
APPENDIX.....	124
Appendix A: Survey Instrument.....	125
Appendix B: IRB Submission and Approval.....	129
Appendix C: Permission to Use Survey Instruments.....	133
Appendix D: Invitation to Participate in Survey.....	134
Appendix E: Follow Up Email to Participate in Survey.....	135
Appendix F: Coding of Variables.....	136
Appendix G: Respondent Profile.....	138
Appendix H: Distribution of IM Use Variables.....	140
Appendix I: Correlation Matrix.....	143

LIST OF TABLES

Table 1	Distribution of Respondent Demographics	138
Table 2	Distribution of IM Use	140
Table 3	Distribution of Frequency of IM Use	141
Table 4	Distribution of Duration of IM Use	141
Table 5	Distribution of IM Use Number of People.....	142
Table 6	Distribution of IM Use Type of People.....	142
Table 7	Coding of Variables	139
Table 8	Correlation Matrix	143
Table 9	Comparison of Item-to-Total Correlations for the Psychological Sense of Community Scale	68
Table 10	Comparison of Item-to-Total Correlations for the General Sense of Mattering Scale	70
Table 11	Chi-Square Analysis of Differences Between Subgroups of IM Use.....	72
Table 12	ANOVA Summary Between Groups for Frequency	74
Table 13	ANOVA Summary Between Groups for Duration.....	77
Table 14	ANOVA Results Between Groups for Number of People.....	79
Table 15	Chi-Square Analysis of Differences Between Subgroups of Family	82
Table 16	Chi-Square Analysis of Differences Between Subgroups of Friends at NC State.....	82
Table 17	Chi-Square Analysis of Differences Between Subgroups of Friends Not at NC State	83
Table 18	Chi-Square Analysis of Differences Between Subgroups of Classmates	84
Table 19	Chi-Square Analysis of Differences Between Subgroups of Other	84
Table 20	Hierarchical Regression	90

CHAPTER 1

INTRODUCTION

For today's college students, most commonly referred to as the Millennial generation, (Howe & Strauss, 1987), using technology to communicate is a way of life (Lenhart & Madden, 2007; Rainie, 2009; Lloyd, Dean, & Cooper, 2007). Students are constantly linked via technology to each other, their professors and their class work, and to people they may not have ever met face-to-face. Computer-mediated communication tools, such as email, text messaging, and instant messaging (IM) are the most frequently used forms of socialization for most college students (Junco, 2008; Shiu & Lenhart, 2004; Caruso & Salaway, 2007; Junco & Mastrodicasa, 2007). Shiu and Lenhart (2004) found, in the "Pew Internet and American Life Report: How Americans Use Instant Messaging", that 62% of Americans (ages 18-27) with Internet access were IM users. More recently, Caruso and Salaway (2007) confirm in the "ECAR Study of Students and Information Technology," that the current generation of college students are increasingly using IM, reporting that 91% of students ages 18-19 and 87% of students ages 20-24 use IM. Moreover, a study by Junco and Mastrodicasa's (2007) reported that 79.7% of IM users send instant messages to people who are in the same physical location, including their own residence hall or apartments. Matthews and Schrum (2003) add to that finding reporting that students disclosed that they carried on electronic conversations with their roommates while in the same room. This is potentially surprising news to those who believe that computer-mediated communication is reserved for those who wish to communicate but who are separated geographically by miles and time zones.

Also surprising to some may be the amount of time students spend using IM. Caruso and Salaway (2007) report that 84% of college students use IM every day. Morgan and Cotten (2003) add that first-year students spent an average of 16.3 hours a week using IM. Junco and Mastrodicasa (2007) found that 75.5% of their sample (n=5,184) used some type of IM program of which the largest proportion of these users were logged in 24 hours, 7 days a week. It is expected that these trends will continue to grow, especially on college campuses where students have adopted IM as one of the primary means of communicating with friends (Shiu & Lenhart, 2004), and more recently with faculty and administrative departments on campus (Kruger, 2005; Farrell, 2007; Kelly, 2009; Severs, 2007; Barratt, 2004).

The blending of online and offline worlds will continue to impact how students define, and more importantly, experience the college community. As Shier (2005) points out, “students’ definition of community has moved beyond geographic and physical locations” (p. 83). It is well documented that the creation of a strong community is a priority for higher education, yet community continues to be defined through the traditional lens. Conventional thought within most institutions of higher education maintains that community only exists within the walls of classrooms and residence halls. As instant messaging use on campus expands, it is critical that we broaden our understanding of what community is and how it is formed.

To assist us in understanding how students define and experience community is to gauge the strength of their sense of community. “Sense of community” refers to a sense of belonging and attachment to a community (McMillan & Chavis, 1986). In his foundational work on the construct, Seymour Sarason (1974) defined it as interdependence between an

individual and a community. Sense of community entails interaction with other members of the community and satisfaction with and attachment to the community (Buckner, 1988).

McMillan and Chavis (1986) define the term “sense of community” as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p. 9). Their definition stresses four elements of psychological sense of community:

membership in a group, a shared emotional connection between community members, mutual influence of community members on each other, and the sharing of values among community members. The lack of a sense of community is characterized by feelings of loneliness, isolation, and alienation (Davidson & Cotter, 1986). The absence of an individual’s sense of community has been reported as a reason people are not engaged on campuses (Haight et al., 2001), which is critical to student success in college (Astin, 1993; Sandeen, 1989; Kuh, 1991; Kuh, et al., 2005). In other words, if students are not academically or socially integrated, or feel like they are part of the community, then their potential is limited.

Statement of the Problem

Much of the existing research has focused on technology use in the classroom and its effect on academic success. Studying the use of technology in the classroom was a necessary first concern in the literature on academic coursework and distance education. This research should now be followed by a focus on the ways in which students use technology to interact with each other.

Many educators fear that increased reliance on technology, specifically the use of IM, is contributing to the loss of students' sense of community; yet, this has not been empirically tested to date. A sense of community is important to the success of students and an ongoing, long-term relationship with peers and others within the university is beneficial to both the student and the institution (Astin, 1984; Pascarella & Terenzini, 1991; Jacobs & Archie, 2008). Studies that attempt to assess the impact of these relationships on student outcomes often use measures of Tinto's (1993) concepts of social and academic integration. However, Tinto's measures portray only certain aspects of membership in social and academic communities. Sense of community (Sarason, 1974), a construct developed in community psychology, helps to further explain various dimensions of belonging and membership. Based on Sarason's research, McMillan and Chavis (1986) developed a definition of sense of community that has been widely accepted in sociology, psychology, and, more recently, educational research. Using this conceptual model it is possible to use their four elements of sense of community to assess the strength of various communities, including college campuses.

There have been numerous studies employing McMillan and Chavis' (1986) psychological sense of community framework to explain community in institutions of higher education. Sense of community has been studied in relationship to college burnout (McCarthy, Pretty, & Catalano, 1990), social integration (Berger, 1997), the psychological trait of extroversion (Lounsbury & DeNeui, 1996), first-year college experience (DeNeui, 2003; Berger, 1997; Jacobs & Archie, 2008), and living-learning communities (Berger, 1997; Wright, 2004). Lounsbury and DeNeui (1995, 1996) also investigated the relationship

between psychological sense of community and campus residence and academic major, year in school, and gender.

The efficacy of the technology used to teach and provide student services to distance learners has been the subject of numerous research studies. As the population of distance learners grows, the factors that contribute to their success have been debated. Analogous with the research regarding on-campus students, one consistent finding from the distance learning literature is the importance of creating a sense of community to ensure student success and satisfaction with their learning experience (Moller, 1998; Kretovics, 2005; Rovai, 2002; Palloff & Pratt, 1999). This sense of community contributes to students finding support, success, and satisfaction in their learning experiences. Although this community is created over the Internet, namely through the establishment of virtual communities, it is no less valid and important to the success of the distance learner (Meyers & Otash, 2004; Hirt, Bryant, & Williams, 2003). This research is evidence that community can be created in non-traditional ways, including using IM to connect students with each other.

Because the Millennials are the largest segment of the American population using IM, much of the more recent research has focused on the impact IM has on teenagers and young adults. While some researchers report that IM is detrimental to students' psychological well-being by increasing loneliness (Moody, 2001; Bugeja, 2005), isolation (Nie, 2001; Nie & Hillygus, 2002; Treuer & Belote, 1997), depression (Morgan & Cotten, 2003), and potentially distracting to academic pursuits (Lloyd, Dean & Cooper, 2007; Grinter & Palen, 2002; Kubey, Lavin, & Barrows, 2001), others have found that IM benefits students by allowing them to connect with others on a more intimate level than would have been possible

otherwise (Blais, 2007; Kretovics, 2005; Shier, 2005; Rheingold, 1991). According to Wellman (2001) in his study examining the influence of Internet use on “social capital”, he found that “online interactions fill communication gaps between face-to-face meetings” (p.438). Wellman is suggesting that the availability of IM allows conversations to be continued or updated in between the next face-to-face meeting. If IM is increasing the frequency and perhaps quality of social interactions, IM could be found to be an additional and important tool for enhancing relationships. Furthermore, cultivating these positive social relationships are fundamentally important to creating community.

While some have criticized the increase of communication via computer-mediated communication and the decline of face-to-face communication, Hill (1996) reports that there has been no research that supports or rejects that the psychological sense of community is diminished by online interaction, such as the use of instant messaging. In addition, Lounsbury and DeNeui (1996) bring to light the need for additional research that examines the relationship between psychological sense of community and technology. Lloyd, Dean, and Cooper (2007) state that “technology provides an opportunity to stay connected with one another, but how that technology impacts their peer relationships [and the development of community] has not been fully examined” (p. 485).

IM is one of the fastest growing communication technologies among college students (Jones, 2002; Caruso & Salaway, 2007; Junco & Mastrodicasa, 2007); therefore, this phenomenon requires closer examination. As the use of IM continues to grow, both in numbers of students using it to communicate with each other and with the advent of student services (e.g. academic advising, library, and campus security) using it as a tool to impart

information to students (Haberkorn, 2004), it is imperative now, more than ever before, to explore the influence IM use has on how students experience the campus as a community. The research question that will be addressed in this study is to what extent does technology use impact sense of community on college campuses. More specifically, how does students' use of instant messaging influence their psychological sense of community?

Conceptual Framework

This research will be grounded in two fields of study: community psychology and student development theory. McMillan and Chavis' theory of Psychological Sense of Community (PSOC), Schlossberg's Marginality and Mattering theory of student development, and Astin's Theory of Involvement will serve as the theoretical framework for this study. McMillan and Chavis (1986) define "sense of community" as a feeling that members have of belonging, a feeling that members matter to one another and the group, that they have duties and obligations to each other and the university, and that they possess shared expectations that members' needs will be met through their commitment to their shared goals. There are four elements of sense of community including membership, influence, reinforcement, and shared emotional connection. *Membership* is belonging to a group. *Influence* is the sense of making a difference or mattering; the reciprocal relationship of mattering to the group and the group mattering to its members. *Reinforcement* is the feeling that the community will provide resources that will meet a member's needs. *Shared emotional connection* is the belief that members share a history, common places, and similar experiences. In summary, sense of community is a belief that members will feel like they belong, that they can have control over or be influenced by the community, that their needs

will be met by their community, and that they, through their experiences, will develop a strong emotional bond because of their similar histories and shared experiences (Davidson & Cotter, 1991).

In Schlossberg's Marginality and Mattering theory, there are two powerful forces, marginality and mattering, that impact whether a person succeeds or fails during a personal transition. *Marginality* is a feeling that one is on the fringe or on the outskirts of an existing community (Schlossberg, 1989), and "not of central importance" (Merriam Webster Dictionary, 2008). If a person feels marginalized, feelings of self-consciousness can arise. Increased self-consciousness can then lead to an inability to perform at one's normal ability level. *Mattering* is the feeling that an individual has that they belong and matters to the group. When a sense of mattering exists, the feelings of marginality diminish which can, in turn, support a healthy and successful personal transition. This theory, as it relates to higher education, underscores the concept that students succeed when they matter, or feel valued by others. Students do not succeed, either socially or academically, when they feel marginalized. In essence, feelings of marginality and mattering are based in a student's feeling of belonging and mattering to a community.

Astin's (1984) Theory of Involvement is another concept that helps to explain the factors that contribute to student success. This theory purports that students learn more when they are actively involved in both their academic and social pursuits. Students who participate in the various activities that a campus community offers, whether talking to a professor at the university's dining hall or being a member of student government, report feeling connected to each other and their university and are more likely to have a successful

college experience. In other words, successful students, according to Astin (1984), are those who are actively involved in their community. Drawing from the work of McMillan and Chavis (1986) on Psychological Sense of Community, Schlossberg's Marginality and Mattering, and Astin's Theory of Involvement, this research will use the strategy presented in their work for operationalizing how students experience the university as community.

Purpose of the Study

Although some prior research has studied the relationship between Internet use and academic success and social development (Blanchard & Markus, 2004; Bugeja, 2005; Haythornthwaite, 2001; Nicholson, 2002; Palloff & Pratt, 1999; Lloyd, Dean & Cooper, 2007; Rovai & Lucking, 2003; Wellman, et al., 2001), existing research does not address how the widespread use of IM has contributed or detracted from college students' sense of community. The purpose of this study is to use the community framework of McMillan and Chavis (1986) and the student development theories of Schlossberg (1989) and Astin (1984) to explain whether and to what degree students' sense of community is influenced by instant message use.

Research Questions

With the increasing numbers of college students using IM to communicate with each other, it is possible that this use is having an affect of their sense of community. The research questions for this study are as follows:

- (1) Are there differences in students' use of IM based on age, gender, race, classification, college, residential status, permanent address, involvement in activities, and sense of mattering?

(2) To what extent does students' IM use influence psychological sense of community after controlling for age, gender, race, classification, college, residential status, permanent address, involvement in activities, and sense of mattering?

Thus, this study will examine the relationship between the use of IM, psychological sense of community, age, gender, race, classification, college, residential status, permanent address, involvement in activities, and sense of mattering. Multiple regression procedures will be employed to examine the influence of instant messaging use on students' overall psychological sense of community, after taking into account pertinent demographic variables.

Definitions of Terms

This study utilized specific terminology that is described in this section. Further definitions of terminology frequently used in the study can be found within the study.

Computer-Mediated Communication (CMC): Computer-mediated communication is communication between two or more individuals over a computer network, including email, IM, and chat rooms.

Distance Learners: Students who participate in distance education are referred to as distance learners. These students attend courses primarily, if not solely, online. They use technology, namely the Internet, Email, and IM, to access course materials, submit coursework, and communicate with each other.

Information Technology: For the purposes of this study, technology refers to any artifact including software, hardware, Internet, etc. that is used to store, retrieve, and manipulate information.

Face-to-Face: Face-to-face refers to meetings or conversations between individuals that take place offline, or in real life, as opposed to in cyberspace.

Instant Messaging (IM): Instant messaging and IM will be used interchangeably. Instant messaging is a form of computer "chat" that allows one to have a real time, usually typed conversation with one or more people while connected to the Internet. Instant messaging will refer to synchronous or near synchronous communication via computer or IM enabled cell phones. According to the "Pew Internet and American Life Report: How Americans Use Instant Messaging" (Shiu & Lenhart, 2004), 15% of all instant message users have used a cell phone or Personal Digital Assistant (PDA) to communicate via IM, therefore, this type of instant messaging will be included.

Millennials: Howe and Strauss (1987), in their book "Millennials Rising: The Next Great Generation", coined the term 'Millennials' for those children who would be entering college in the year 2000. More specifically, it refers to people born between 1982 and the late 1990s. The term Millennials will be used unless the researchers specifically use the term GenY in their studies.

Online: The term online means any type of activity that occurs through a computer or computer network, most often via the Internet. Offline refers to any activity that is not performed through a computer or computer network.

Online Social Networks: A social network that is built or experienced online. These are communities of people who share interests and activities or who are interested in exploring the interests and activities of others.

Synchronous Communication: Synchronous communication takes place when people are connected at the same time (real time communication) whereas asynchronous communication does not require people to be online at the same time. Asynchronous, email, for example, is communication that is time delayed.

Text Messaging: Text messaging is similar to instant messaging in that individuals can communicate text-based messages to text enabled cell phones. However, it is important to make the distinction between text messaging and instant messaging as some cell phones have instant messaging clients available allowing students to conduct instant message conversations over their phones. This type of IM will not be separated from instant messaging via other wireless devices or desktop computers. For the purposes of this study, IM does not refer to text messaging.

Virtual Community: A virtual community is an online community of people that primarily interact via computer-mediated communication media, such as instant messaging and email, rather than face to face, for social, professional, educational or other purposes.

Other Definitions

Classification: Classification refers to the year in school, e.g. Freshman, Sophomore, Junior, or Senior.

College: College refers to the academic curriculum in which the student is enrolled.

Institutions of higher education: The terms “university” and “college” will be use interchangeably.

Full-time: NC State University classifies students who are enrolled in at least 12 credit hours as full-time students.

Permanent Residence: Permanent residence will refer to the home address of the student. Students will be categorized as in-state, out of state (including international).

Residential Status: Residential status will refer to where a students' primary residence is located (off-campus or on-campus in a residence that is university owned, operated, or affiliated).

Significance of the Study

Sarason (1974) suggests that any community has the ability to promote positive outcomes for its residents. By identifying what aspects create a strong psychological sense of community, we will be able to enhance those aspects. Institutions of higher education must understand who their students are and how they build communities in order to provide the appropriate services to ensure student development and learning. The findings from this research have the potential to redefine or expand our notion of community that takes into account the characteristics of the current generation of students on campus.

Contributions will be made to the theory proposed by McMillan and Chavis (1986) and will strengthen their model for use in other studies. The current study may also contribute to practice as well by helping higher education administrators develop a more complete understanding of how technology is shaping students' lives.

CHAPTER 2

REVIEW OF THE LITERATURE

In this chapter existing research will be examined to formulate the theoretical basis for this study. The first section will define community, explore the concept of universities as communities, discuss the impact of technology on today's student, and review two student development theories that relate to the study.

Concept of Community

Communities are the heart, the soul, the nervous system, and the lifeblood of human society. Communities provide mutual support and love in times of celebration and in times of crisis. There are also pragmatic reasons for banding together. People are infinitely more capable than when they work on their own (Schuler, 1996, p. 1).

In order to understand fully what "community" is and the importance of community in our lives, specifically in the lives of today's students, it is necessary to review the evolution of the concept. Although a discussion of the complete history of the evolution of community is not warranted, it is important to understand that community is not just a idealistic concept but a relevant tool to use to examine how and why groups succeed or fail. Community life began when hunters and gatherers settled in one place, "had permanent homes and lived in close proximity to each other, which led to common norms, values and institutions" (Hassinger & Pinkerton, 1986, p. 4). Social relationships developed and became necessary to survival in line with the basic human needs like food, water, and shelter. These social relationships were the fabric of the communities that supported its members as they supported each other.

One of the first, and most well known, scholars to identify community as a concept that could be studied is the sociologist Ferdinand Tönnies (1855-1936). In his work, “Community and Society” (1897:1957), he identified two types of social groups: Gemeinschaft, or community, and Gesellschaft, or society. Gemeinschaft is thought to be a group in which families, friends, neighbors, or others whose foundation may be formed by “natural ties of kinship”, and have shared beliefs, customs, or a “common way of doing things” (1957, p. 224). Gesellschaft is thought to be a group in which its members were brought together by a common goal or need that they expect to get from the group, e.g. the city or the state (Bell & Newby, 1972). According to Tönnies, these two groupings are formed because humans exhibit two types of will: essential and arbitrary. Essential will is “organic and underlying,” or the will that drives people, whereas arbitrary will is a “purposive, goal oriented,” membership is reasoned as a means to an end (1957, p. 235). Tönnies was describing community, perhaps for the first time, as a bringing together of people who had similar characteristics outside of geography.

Since Tönnies’ conceptual model, communities have been defined in a variety of ways by differing schools of thought, even within the same area of study. Although the notion of community has been widely discussed within the literature, researchers have yet to establish a complete and overarching definition (Harrington, 1997, p. 17). Hillery (1957), attempting to find a common understanding or definition of “community”, identified and coded 94 occurrences of the term, citing only one common element in all of the definitions; “all of the definitions deal with people” (p. 25). Hillery also found that definitions could be placed into two categories: proximity to a certain place and sharing a common interest

(1957). Twenty years later, Gusfield (1975) expounded on Hillery's work and found that descriptions of community tend to fall within two major classifications: territorial, based on geographical locations (e.g., neighborhoods, schools, places of work) and relational, based on social network relationships or common interests (e.g., political groups, soccer teams, vegetarians). More recently, in "New Community Networks Wired for Change" (1996), Douglas Schuler writes that communities can be defined in three ways, "people living in a contiguous geographical area, a group of likeminded people, or it may mean 'sense of community' – a state of group communion, togetherness, and mutual concern" (p.2).

Psychological Sense of Community

Psychological sense of community (PSOC) is the concept that community is an emotional connection created by social relationships and interactions, not solely in a physical space with a group of people located inside of it. It is this "sense of community" that is the focus of not only the current research, but of a substantial amount of research in the past 30 years. Seymour Sarason (1974), in his groundbreaking and influential work *The Psychological Sense of Community: Prospects for a Community Psychology*, defined psychological sense of community as:

The sense that one belongs in and is meaningfully a part of a larger collectivity; the sense that although there may be conflict between the needs of the individual and the collectivity, or among different groups in the collectivity, these conflicts must be resolved in a way that does not destroy the psychological sense of community; the sense that there is a network of and structure to relationships that strengthens rather than dilutes feelings of loneliness. (p.41).

He went on to explain that psychological sense of community is, “the perception of similarity to others, an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, the feeling that one is part of a larger dependable and stable structure” (p. 157).

Since the mid 1970s, much of the research that has explored Sarason’s concept of “psychological sense of community” has involved studies of neighborhoods. Glynn (1981) in his study of examining neighborhood cohesion found that “the strongest predictors of actual sense of community were expected length of community residency, satisfaction with the community, and the number of neighbors one could identify by name” (p. 801). Glynn also found a “positive relationship between sense of community and the ability to function competently in the community” (p.814). Researchers Riger and Lavrakas (1981) in their study of urban neighborhoods found that once again there are two empirically distinct types of community: social bonding and physical rootedness. Social bonding contains items that are linked to the notion of “sense of community” with items concerning the ability to identify neighbors, feeling part of the neighborhood, and number of neighborhood children known to the respondent. Physical rootedness involves years of residency, whether one’s home is owned or rented, and expected length of residency.

Sarason’s work initiated a number of studies involving the impact that sense of community has on the success of that community. Researchers studying neighborhoods and workplaces as communities found that there was a relationship between psychological sense of community and greater participation (Wandersman & Giamartino, 1980; Hunter, 1975), increased social fabric, as defined by the strengths of interpersonal relationships (Ahlbrandt

& Cunningham, 1979), perceived safety (Doolittle & McDonald, 1978), increased sense of purpose and perceived control (Bachrach & Zautra, 1985), increased civic contributions, which include charitable contributions and civic involvement (Davidson & Cotter, 1986), a greater attraction-to-location (Ahlbrandt, 1984); and enhancing academic and social development (Royal & Rossi, 1996). More specifically, Royal and Rossi (1996) found that employees or staff members experiencing a strong sense of community tend to be clearer about the expectations others at school have for them and tend to report feeling burned out, overwhelmed, or confronted with conflicting demands less often at school.

The most widely used and validated measure that has been employed when studying different types of communities, the Sense of Community Index (SCI) (Chavis, et al, 1986), is based on McMillan and Chavis' (1986) definition of "sense of community". This version and psychometric measure of PSOC will serve as the theoretical model for this research that will be discussed later in the chapter.

Universities as Communities

Just as the neighborhood and workplace studies revealed, the importance of sense of community is critical to the success of those within the community. This is especially true for higher education. The importance of creating a sense of community in colleges and universities has been well documented (Astin, 1984; Kuh, 1991; Spitzberg & Thorndike, 1992). To assist in defining community in a college setting, Spitzberg and Thorndike (1992) state that campus community is the "values, goals, and practices that individuals share and that constitute the basis for coming together" (p. 8). These shared values and goals and a supportive community prove imperative for student success. For example, McCarthy, Pretty

and Catano (1990), in their study of student burnout, state that there is a significant “importance of university community environment to [student] adjustment and well-being” (p.211).

Even before student success as influenced by sense of community were empirically studied, Esther Lloyd Jones’ (1937), in the pamphlet “The Student Personnel Point of View”, published by the American Council on Education, implored university personnel, both inside and outside the classroom, to “pay special attention to students and considering them as they lived in the *community* with one another” (1989, p. 1). Ernest Boyer (1987) in “College: The undergraduate experience in America”, asked educators to focus not only on the intellectual quality but the social quality of the undergraduate experience as well. He urged universities to be actively involved in building community on campuses. For student affairs practitioners in particular, one of the primary goals of higher education “in recent years has to do with the concept of community-building” (Wiley, 2002). In the “Boyer Commission on Educating Undergraduates in the Research University” (1998), educators were reminded that “a sense of community is an essential element in providing students with a strong undergraduate education (1998, p. 34). Pascarella and Terenzini (1991) in their seminal work, “How College Affects Students: Findings and Insights of Twenty Years of Research”, add that the quality of undergraduate education is dependent on such factors as the “institution’s educational *community* which includes climate, social involvement, peer interactions and co-curricular experiences” (p.29). In essence, these professionals and researchers purport that the quality of postsecondary education is significantly enhanced by the existence of a strong community.

The support and collaboration that a community provides is evident in more tangible student outcomes, namely student retention (Astin, 1984). Tinto (1993) stressed the importance of the interaction of students and the campus *community*, stating that it enhances student success and persistence and reiterated the importance of “the transition between membership in past communities and membership in new communities of the college” (p. 125). In addition, as McCarthy, Pretty, and Catano (1990) reported, “students experiencing a strong psychological sense of community in their living environment reported lower burnout as compared with those not experiencing a strong psychological sense of community in their living environment” (p. 216). The learning community within a university “fosters a greater sense of community among learners [and] promotes greater retention and achievement for students” (Rasmussen & Skinner, 1997, p. 12). Harris (2006) found that students who were joined together through adult education cohort programs felt a greater sense of community over those who were left on their own to study and take classes, and therefore were more likely to “reach their goal of getting a college degree” (p.103). As these researchers found, sense of community is not just a sentimental concept but has a direct influence on student success.

There are immeasurable types of communities in colleges and universities; however, two types have been the focus of numerous studies in recent years: the classroom community and the residential community. A classroom community is a social community of learners who share knowledge, values, and goals (Hill, 2002; Tu & Corry, 2002; Rovai & Lucking, 2000). Social interactions are responsible for creating community and are “crucial for establishing rapport and developing a climate conducive to learning, thus enabling

participants to form a learning community” (Contreras-Castillo et al., 2006, p. 206).

McKinney, et al. (2006) found that increased levels of sense of community significantly predicted students' classroom attitudes, perception of learning, and actual performance on course exams – higher levels, higher test scores, lower levels, lower test scores.

A residential community on campus usually refers to the place where students live on campus. In most instances university educators attempt to create a residential community that is a living-learning community or a “residential education unit in a college or university that is organized on the basis of an academic theme or approach and is intended to integrate academic learning and community living” (Bowling Green, 2008). Much has been written about the impact of students’ residential experience and how it impacts student development and sense of community. Researchers have explored issues related to what constitutes successful programming in the residential hall thereby increasing sense of community to designing the actual physical space to encourage interaction and thereby sense of community (Devlin, et al., 2008). Murphy (2003), for example, found that participation in a living learning community had many benefits for students; “they experienced an easier transition to college, felt a stronger sense of peer community...and exhibited significant levels of success in learning outcomes” (p.2). Cheng (2003) concurs stating that students who had positive residential experiences had a greater sense of community.

Virtual Communities

Although there is a growing body of literature on classroom community and residential communities, there is also an increasing interest in virtual communities, or those created in cyberspace. Individuals who are brought together by similar thoughts, feelings,

and interests and communicate via the Internet are members of virtual communities. In "The Virtual Community," Rheingold (1991), who is responsible for the widespread use of the term, defines virtual communities as "social aggregations that emerge from the [Internet] when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace" (p. 5). The idea that it is possible to create community in cyberspace upsets the traditional notions of communities that are defined by the physical space that they occupy. Yet, Hill (1996) points out that some researchers have "suggested strongly that the communities that are most important to people may not be defined in a geographic sense" (p. 433), as in the community found in a neighborhood or school.

The traditional definition of classroom often evokes images of a room in a building with walls and a roof, however, Haythornthwaite (2001), states that classroom community is no longer bound by geography. Communities are not solely communities of place or even communities of interest tied to a physical space. Virtual classroom communities can be built online as students in distance education courses are also able to share ideas and reflect on what they learn to create the community imperative to success (Hill, 2002; Chickering & Ehrmann, 1996; Moller, 1998; Rovai & Lucking, 2003; Tu & Corry, 2002). Rovai and Lucking (2003) concur stating that community in online courses can be formed comparable to the community that is formed in traditional face-to-face classes. Regardless of the distance between them, it has been found that "interactions and relationships help create strong and vital [virtual] communities" (Schuler, 1996, p.3). However, virtual communities are often touted as insufficient or not a genuine community simply because of the technology that is

necessary to create them (Bugeja, 2005; Putnam, 2000). The increase in the utilization of technology to form these virtual communities is one of the most powerful forces cited in recent literature for contributing to the loss of community.

Loss of Community

Although technology appears to be the more recent foe of those looking for something to take the blame for the loss of community, the concept of loss of community has been around since the beginning of the concept of community. Kuh (1991) and Glynn (1981) cite that a common theme in much of the sociological literature makes reference to the twentieth century's loss of community. Glynn cites industrialization, the growth of centralized bureaucratic and governmental structures, and the maintenance of an improper balance between local and centralized structures and claims that these are responsible for the "erosion of traditional social supports in our communities and the impact of this erosion on sense of community" (Glynn, 1981, p.800).

In the United States in particular, there is ample evidence of community deterioration (Spitzberg & Thorndike, 1992; Jason & Kobayashi, 1995; Putnam, 2000; McPherson, Smith-Lovin, & Brashears, 2006). Schuler (1996) states that loss of community is "aggravated by the existence of several factors including the transitory nature of our communities (people moving, neighbors coming and going), fear (people wary of each other), extreme individualism (myopic denial in which people believe they have to 'make it on their own', and obsessive consumerism (owning things, rather than knowing people)" (Schuler, 1996, p.6-7). Putnam (2000), in his book "Bowling Alone", believes Americans in general are experiencing greater isolation and are less likely to engage with each other and their

community as evidenced by fewer get-togethers with extended family, less interaction with neighbors, and a decrease in civic participation.

The apprehension surrounding the perception that community life is deteriorating has been a topic of discussion in higher education. Technological advances have changed the landscape of traditional higher education with the growth of distance education, virtual programs, and on-demand services available via the Internet in all of the aspects of educating students (online classes, students using technology, accessing the library via computer, etc). As students move out of the physical spaces of the university, this seemingly impersonal technology has often been pointed to as a possible cause for the loss of community in higher education. Particularly in student affairs, those educators who are responsible for ensuring the out-of-classroom experiences necessary to student success, practitioners have grappled with how to engage students who are immersed in technology to communicate with the world. The area of student affairs is founded on the ideals of building a strong sense of community on campus that emphasizes student development both inside and outside the classroom. With technological innovation in the classroom and now with many student services and programs going online, some educators have asked, are we losing touch with our students as they go behind a computer screen? In other words, “are we jeopardizing the whole student by passively encouraging isolation and contributing to the loss of community?” (Spitzberg & Thorndike, 1992, p. 9). Regardless of which elements of our society are to blame for the loss of community, whether in neighborhoods or universities, authors and researchers believe our communities are deteriorating; a subject which requires our immediate attention.

Technology in Higher Education

The question that researchers are asking is whether technology is to blame for the loss of community? In spite of the answer, technology is omnipresent in our lives and there is no circumventing the fact that the presence alone of technology will continue to influence the social structure and community, especially in higher education. It has been a long held idea that the concept of “community” and the concept of “technology” are like oil and water. Some scholars have a tendency to describe communities as supportive and loving, whereas technology is cold, bewildering, and dangerous. What is troubling is the affect that this idea could prevent us from taking an active approach to understanding how it works and what it means, and what impact it may have on college students and community on college campuses. If not examined, “technology will forever be daunting, and people will continue to be victimized” (Schuler, 1996, p. 32).

Technology is playing an increasing role in “humankind’s seemingly unquenchable thirst for communication and information” (Schuler, 1996, p. 215). The influence of technology is widely evident in higher education where technology has implications for how educators teach and students learn, especially for the current Millennial students.

Millennials and Technology

Millennial students are often referred to as digital natives (Prensky, 2001); meaning that today’s traditionally aged college students entering college have only known life with technology, such as the laptop, cell phone, etc. With all of the current technology at their disposal, including the ones that make them seemingly oblivious to the world and people around them (iPods, PDAs, cell phones, laptops), Millennials are showing themselves to be

more group-oriented than the previous GenXers. This is especially surprising when we see them immersed in their laptops and sitting quietly with their iPods.

Seven common traits are exhibited by Millennials: special, sheltered, confident, team-oriented, conventional, pressured, and achieving (Howe & Strauss, 2003). According to Oblinger and Rush's (2003) recent report, "The learning revolution: The challenge of information technology in the academy", Millennials are also described as being interested in new technologies, preferring group activities, and planning to stay connected with friends and family while in college, rather than separate themselves from their past, ie. high school relationships, when they attend college as previous generations of students have.

One of the prominent characteristics of Millennials, especially when speaking of their use of technology, is that they are multi-taskers. According to the "Pew Internet and American Life Project: How Americans Use Instant Messaging", not only do 62% versus 37% of GenXers, the previous generation of Americans born from 1961 to 1981, use IM, but they multi-task, doing their homework or surfing the web, while Using IM; 49% multitask in comparison to GenX's 2%. This trend was also documented in Grinter and Palen's (2002) study with students reporting that they regularly used IM also using the computer to work on schoolwork, surf the web and read and compose email. Additionally, some Millennial college students reported that they have their IM clients open and ready to use at "all times" and are actually studying between their conversations (Matthews & Schrum, 2003).

However, multi-tasking can have a negative connotation. Some analyzers of today's modern society claim that the powerful influx of technology into our daily lives has contributed to greater individualism, increased distraction (the inability to focus), and the

decline of critical thinking skills (Jackson, 2008). And although the implementation of technology in the classroom has been a welcome addition for some, Hiltz (1998) suggests that use of specific technologies in the classroom can deplete social relationships and sense of community.

Instant Messaging

Social relationships are very important to Millennials (Oblinger & Rush, 1997) and are maintained in a variety of ways. Gone are the days in the 1980s and 1990s when people relished in the excitement around digital answering machines and cordless phones to maintain contact with friends and families. Although varying degrees of technologically sophisticated computer-mediated communication have been around for a number of years, for many Americans, and for many more college students, IM is how they keep in touch with friends and family. Instant messaging (IM) is a form of computer-mediated communication that allows two or more users to communicate in synchronously, or in real time, over a network connection most often over the Internet with a personal computer. Once an IM client, or a particular type of software that runs the instant messaging program, is installed, the user can connect with others who have an IM client on their computer.

Instant messaging allows one to hold conversations, most often text based but increasingly combined with audio and video, with others without the delay that email presents. The most popular of these IM clients include America Online's Instant Messenger (AIM), Microsoft's Messenger, and Yahoo! Messenger. These particular IM programs are free to the user and are simple to operate, especially for today's technologically savvy college student. More recently, social networking sites such as MySpace.com and

facebook.com that millions of teenagers and young adults use, added an IM feature: MySpaceIM in May 2006 and facebook.com in April 2008.

Instant messaging is not a new phenomenon but became popular in the mid 1990s following its predecessors IRC's (Internet relay chat) and MUD's (Multi User Dungeons) footsteps (Chu, 2003). Although similar to MUDs and IRCs in many ways, one main difference is that "while these older programs allow strangers to meet others they do not know in a virtual community, instant messaging is intended to allow individuals to communicate online with others that they already know from real life" (Grinter & Palen, 2002, p. 21).

Several distinctions must be made regarding instant messaging and other computer-mediated communication such as online chat and text messaging. Instant messaging differs from online chat in that instant messaging usually occurs privately between two users. Also, while online chat rooms were initially intended to introduce people who have never met online, most students who instant message do so with people they also know offline (Squires, 2003; Valkenburg & Peters, 2007a; Gross, 2004; Grinter & Palen, 2002). Text messaging usually refers to communication via a cell phone that is usually limited to a certain number of characters, whereas instant messaging does not have a limit on the number of words or characters. Text messaging is typically used for shorter and less involved conversations than instant messaging (Pew, 2002).

Yet another distinction is that IM is thought to be reserved for computer or laptop use; however, more recently, cell phones or smart phones, have evolved to possess instant messaging capabilities. More specifically, IM is distinguished from traditional text

messaging by the nature of its simulation of a real time conversation as opposed to messages left via text without expectation of immediate response. One more distinction to note is that whereas email is more similar to a combination of written communication and speech, IM has been described as having the characteristics of both phone and email communication (Farmer, 2005; Baron et al., 2003) in that the style of talking has the tempo of a phone conversation but the ability to view language as text of email conversations.

Although much of the current IM use is among the younger population (ages 14-24), IM has also has implications for an older population using IM to facilitate business operations. IM has been used in business settings under the guise of increasing communication within the staff and with customers. Some research has shown that IM has increased productivity by serving as the medium for increased coordination (Grinter & Eldrige, 2001; Isaacs, Walendowski, & Ranganthan, 2002; Nardi, Whittaker, & Bradner, 2000). Contreras-Castillo et al., (2006) add that “the use of instant messaging within organizations shows that it has been successful in establishing social bonds and improving communication within workgroups” (p. 206).

Nevertheless, the majority of IM users are young people who are in high school or college. IM is the preferred method of communication and socialization for young people (Shiu & Lenhart, 2004; Grinter & Palen, 2002; Nachbaur, 2003). To reiterate their staggering findings in the “Pew Internet and American Life Project: How Americans Use Instant Messaging” (Shiu & Lenhart, 2004), in which the data are already several years old and perhaps the numbers are much greater now, report that 62 % of people ages 18-27 use IM. According to one more current, yet informal study, performed at Stanford University in 2003,

90% of their students use IM on a daily basis (Nachbaur, 2003). IM has begun to take over email as the more popular method to communicate with friends and family due to its seemingly informal nature (Hu, Fowler Wood, Soth, & Westbrook, 2004; Gemmill & Peterson, 2003; Lovejoy & Grudin, 2003).

Reflect on the hours spent instant messaging, emailing, and surfing the web and it is obvious that college students are spending an increasing amount of time online. Researchers are finding that a growing number of students are starting to feel the affects of Internet use. Kubey, Lavin, and Barrows (2001) found that 9% of mostly first year students agreed or strongly agreed that they were a “little psychologically dependent on the Internet” (p. 370). They also discovered that 14% of the respondents said that their schoolwork had suffered occasionally, frequently, or very frequently due to their Internet use. According to their research students felt increased loneliness, experienced a lack of sleep on a regular basis, and missed class more frequently because of their Internet use or overuse. Lloyd, Dean and Cooper (2007) report that students who use the Internet, including IM, for socialization purposes, exhibit lower levels of educational involvement. Matthews and Schrum (2002) found that time spent instant messaging was negatively correlated with the ability to avoid distractions created by the Internet and concentration on academic work.

The problem of the distractions created by the Internet goes beyond bad grades. Kraut, et al., 1998, in a longitudinal study of Internet use, found that Internet use causes a decrease in social engagement and an increase in poor mental health. According to the researchers, these troubling factors are hazardous to a productive and fully functioning community. The problem, they say, with online interaction replacing face-to-face interaction

is that face-to-face interaction is of a higher quality than online interaction because it offers subtle non-verbal cues that, to date, cannot be replicated by text-based online communication.

According to researchers, the result of using the Internet to communicate reduces the quality and depth of face-to-face communication, and results in negative consequences for the community. In his report, "Sociability, Interpersonal Relations, and the Internet," Norman Nie (2001) states, "At the heart of this debate is whether Internet use can be a potentially isolating activity or one that leads to substantially greater communication among people and thus enhances human connectivity and sociability" (p. 421). Nie and Hillygus (2002) argue that "the more time spent online, the less time is available for socialization" (p. 11). Nie and Erbring (2002) report that adult and teen Internet use contributes to reductions in the size of social networks and increased feelings of loneliness. Flowers, Pascarella, and Pierson (2000) add that their quantitative study of college students indicated that computer and email use does not contribute to intellectual growth over the first year of college. Email use in particular was shown to have a negative correlation with intellectual growth, specifically among two-year college students.

Students increasingly replace face-to-face interactions with online communication, allowing themselves to "disengage physically and psychologically from campus community" (Taub, 1998, p. 414). Bugeja (2005) states that by nature communities' members must interact face-to-face in order to make the emotional connection that binds members of a community together. Using technology creates an emotional disconnect and creates a "void in morals and emotional wellbeing in the community of its members" (p. 41). Baym (2002)

found that face-to-face and phone use are related with increased social wellbeing, but Internet use, including instant messaging and chat, is not. Treuer and Belote (1997) discussed the idea of “cocooning” whereby a student retreats to his or her computer and becomes isolated rather than involving him/herself in campus activities, proactively becoming part of the campus community. Mesch and Talmud (2006), when comparing adolescents who met online and those who met face-to-face found that online relationships are limited because they are new and lack shared experiences that create the boundaries and shared identity of close relationships. Valkenburg and Peters (2007b) drawing on a survey of 816 adolescents, found that Internet communication with strangers was negatively related to well-being and increased feelings of loneliness.

Not all studies have uncovered the same results regarding the quality or relationships and the formation of community and Internet use. For example, Internet communication has been shown to decrease feelings of isolation and increase social support (LaRose et al., 2001). Shaw and Gant (2002) used assessments such as the Center for Epidemiological Studies Depression Scale, the Texas Social Behavior Inventory, and the Revised UCLA Loneliness Scale before a treatment of five sequential anonymous chats and after and found that students’ scores on depression and loneliness were significantly reduced. Morgan and Cotten (2003) found that hours spent emailing and using IM decreased depressive symptoms as measured by the Center for Epidemiologic Studies Depression Scale. Introverts report preferring online communication over face-to-face (Koch & Pratarelli, 2004). Some students prefer to use IM to deal with emotionally sensitive or emotionally charged issues (Junco, 2005). Campbell, Cumming, and Hughes (2006) found that undergraduate student chat users,

when compared to non-chat users, were not as likely to report being fearful in social situations. Using the Internet to communicate socially seemed to be a low-risk method of exploring social situations.

IM, by its very nature, is virtual, or occurring in a virtual world. According to some researchers, virtual communities are an extension of real communities, and another opportunity to interact and expand on the face-to-face relationships (Wellman & Gulia, 1999). Haythornewaite (2001) argued that the virtual online world and “real” world cannot and should not be discussed dichotomously. She suggested that it is important to view them as complimentary realms where the relationships in one are just as real as in the other. Baym (2002) concurs, stating that it is impossible to separate community relationships as either real or virtual. Squires (2003) reiterates Haythornewaite’s and Baym’s position by suggesting that “technology-entrenched societies (such as the United States and in particular institutions of higher education) relationships cannot be categorized as online or offline” (p.1). Katz and Rice (2002) found that Internet users who are social online, tend to be social in real life as well. Time spent on the Internet did not correlate with a lack of involvement in community life. In their study, online relationships actually strengthened community ties and created more relationships within that community.

A study by Tyler (2002) found that for those who are already skilled at interacting with others in “real” life, communication via the Internet encourages better and more frequent communication. Tyler did not find that there was any evidence that time spent online has a negative effect on personal wellbeing or increased depression. Matei and Ball-Rokeach (2001) discovered that there was a relationship for those with a strong community

orientation in real life who were similarly able to create meaningful virtual communities and relationships. Blais et al. (2007) reported that IM use was “an important and likely agent of positive changes in best friendship and romantic relationship qualities in adolescents” (p. 532). In Gross' (2002) study of adolescents, he finds that those who felt more comfortable with their schoolmates use the Internet "to seek out additional opportunities to interact with them; others who don't feel a strong connection with their schoolmates were more likely to communicate through IM with people they did not know well (i.e. strangers vs. friends)" (p.87). Morahan-Martin and Schumacher (2000) found that 8% of a 277 undergraduate sample who were identified as pathological Internet users experienced greater social ease online than in face-to-face interactions.

Students' use of technology, specifically those technologies that increase communications within the classroom, have resulted in significant increases in community and therefore, student outcomes. Kuh and Vesper (2001) found that those students who used computers scored significantly higher on the College Student Experiences Questionnaire in areas of ability to function as a team-member and understanding other people. Wighting (2006) affirmed that sense of classroom community among high school students was significantly increased in classes that were being taught with a high amount of technology. Overbaugh and Lin (2006), with regard to “sense of community”, students in the Web-based environment had higher scores over the Lab Based environment on two of three scales. Nicholson (2002) reported that students who used IM services found it easier to communicate, felt a stronger sense of community, and had more venues for informal and social communication about class material, the school, and their common degree program.

Rohall, Cotten, and Morgan (2002) found that time spent on the Internet for surfing or other non-communicative purposes was negatively associated with self-esteem, however, IM and chat room use had a small but positive effect on self-esteem and a strong effect on social support.

As in the above cases, computer-mediated communication was encouraged as a complement to “real” interaction. Using IM did not serve to undermine “real” relationships, but rather, enhance them. Randall (2002) in his study of Canadian youth found that “when something is to be celebrated, or something important but negative needs to be communicated, then people clearly believe talking to the person is better than writing them” (p. 35). Therefore, he argues that IM does not replace or hinder students’ real world activities as it only strengthens face-to-face relationships. Nachbaur (2003) provides this description of IM users:

IM is like a coffee shop, a place to meet and chat with people. Yet, since IM’s location is amorphous you and your friends are more likely to be there every time you sign on. This increased availability of causal conversation is a crucial aspect that allows IM to promote closer relationships (p.4).

Research has informed this study and has provided additional evidence that IM should be studied to gauge perceived levels of sense of community within a group of students who may already know each other from other activities or interests but may be enhancing their knowledge of each other and therefore, their sense of community.

Another significant area of the literature involves the differences between gender and Internet use. It is important to examine this literature to identify variables that may impact

psychological sense of community. For example, Kuh and Hu (2001) found that men used information technology more often than women, but Shiu and Lenhart (2004) reported that males and females use IM in equal proportions. Odell, Korgen, and Delucchi (2000) found that differences between male and female time online appeared to be associated with academic major rather than gender, “while the gender gap in use of the Internet has nearly closed, differences still remain in how male and female undergraduates use the Internet” (p. 861). Anderson (2001) added that the Internet interfered with social interactions, most of them males with hard science majors. Shaw and Gant in their 2002 study of college students regarding the differences in how comfortable men and women feel using and communicating on the Internet found that “gender differences did not approach significance [which] might be attributed to the population studied” (p. 525), adding, “more female than male college students use the Internet for E-mail and also for school research, but significantly more males use the Internet to visit sex sites, research purposes, check the news, play games, and listen to or copy music” (p. 862). Herring (1996) warns that “gender differences online reproduce and even exaggerate differences found in face-to-face interaction” (p. 118), with women more likely than men to be polite and supportive of others online. Because there is dissension in the literature, gender will be investigated to study if a relationship exists between gender, sense of community and IM use.

There is a wide spectrum of results from existing studies that provide evidence that using the Internet to communicate has both positive and negative outcomes for students in higher education. Regardless, it is apparent is that IM is an integral part of how students communicate. Although IM provides opportunities to stay connected with friends, and

potentially strengthen their bonds with each other, how sense of community on college campuses is affected has not been studied.

Conceptual Framework

Boyer (1990) in “Campus life: In search of community”, urged universities to be involved actively in building community on campuses. The Boyer Commission on Educating Undergraduates in the Research University states that “a sense of community is an essential element in providing students with a strong undergraduate education (1998, p. 34). It also suggests that the support and collaboration that a community provides should be an outcome that student affairs professionals actively seek; “personal awareness of connections cannot occur unless there is a responsiveness to place and community (1998, p. 35). The basic assumption underlying the Boyer Commission’s position is that students and the university will be successful when students are integrated into the community. The challenge educators face is exactly how to accomplish this integration. Applying student development theory, including Astin’s Theory of Involvement and Schlossberg’s Marginality and Mattering, and community psychology, specifically McMillan and Chavis’ Psychological Sense of Community, provide the necessary conceptual frameworks that will guide this study.

Astin’s Theory of Involvement

Astin's Theory of Involvement (1984) argues that students learn more when they are actively involved in both their academic and social pursuits. An involved student is one who invests significant energy to academics, relationships with both students and faculty on campus, and campus-sponsored activities (Astin, 1984, p.292). Involvement can be

quantitatively assessed by the number of hours devoted to coursework, attending meetings, or engaging in conversations with a fellow student or faculty member. Student learning and development can also be assessed qualitatively by a student's understanding of course material or their reflection on their role as a leader in a campus group. Further, non-involvement (Astin, 1984) is defined as "living at home, commuting, attending part-time, being employed off campus, being employed full-time, and watching television" (p. 126).

Astin (1984) reports that if students are isolated from their peers or are not physically on-campus either to live or to take part in campus-sponsored activities, students are more likely to report feelings of isolation. He found that those who live on campus have an inherent advantage over those students who live off campus, or commute, to get involved in undergraduate life (1999). Students' development is enhanced greatly by environmental influences present in the residence halls, such as friendships and sense of community (Astin, 1999; Arboleda, et al., 2003).

In addition to the differences in student development and satisfaction between students who live on campus as compared to students who live off campus, Furr and Elling (2000) found that students who work off campus tend to be less involved in out-of-class activities and to have less interaction with faculty (Furr & Elling, 2000). However, working on-campus has a positive effect on students' involvement in organizations and contact with faculty (Furr & Elling; Terenzini et al., 1996). It is important to include this activity in the current study as it relates to sense of community.

Student involvement also includes extracurricular activities like student government and intramural or club sports. Like Astin (1993), Artinger, et al. (2006) found that increased

involvement in sports encourages participants to create and maintain wider social networks. The relationships students develop with other students through sports participation are important in terms of student satisfaction (Astin, 1993) and are responsible for creating “opportunities for interaction, collaboration, and unification are essential if campuses are to develop a sense of community” (Dalgarn, 2001, p. 66). Light (2001) also noted the relationship between participation in collegiate organizations and satisfaction with college.

Involvement in activities were included in this study to assess the differences in IM use as well as examining the influence this involvement has in psychological sense of community. Some questions that the research should address are; is the type of activity that students are involved with have an associated with differences in IM use? Are the number of hours using IM negatively correlated with sense of community? Pertinent to this research is whether students will report feeling a part of the campus community although they might be heavy users of IM or if IM use is compounding feelings of isolation for those who are not involved in campus sponsored activities.

Schlossberg's Marginality and Mattering

Schlossberg's theory of Marginality and Mattering is a predominant person-environment theory in the student development literature. The theory posits that when faced with a challenge, students thrive if they feel part of the group and “fail” when they do not. Using indices of self-esteem developed by Rosenberg (1979), Schlossberg argues that there are two forces that interact to determine the success or failure of a personal transition. She calls these forces *marginality* and *mattering*. In Schlossberg's (1989) Marginality and Mattering theory, she describes the notion that a change in a role or the experience of a

transition evokes feelings of marginality. Marginality is the feeling that one does not fit in with the rest of the group. When one feels that they do not fit in, they feel self-consciousness. Feelings of self-consciousness can then lead to an inability to perform at one's normal ability level. She describes that the larger the difference between the prior role and the new role (for example, a high school student and now an undergraduate student attending school away from home) the greater potential of increased degrees of marginalization (Schlossberg, 1989).

Mattering is the feeling that one matters to others. When present, mattering diminishes marginality and promotes a healthy and successful transition through a challenging event. Although the transition may be a one-time event, the process to successfully move through the transition may take place over a longer time. In the context of higher education, it is believed that students succeed when they feel valued by others. Students "fail" (academically, socially, etc.) when they feel marginalized. There are various aspects to the feeling of mattering that include attention, importance, dependence, appreciation, and ego extension. *Attention* is being noticed in positive ways. If one receives positive attention, relationships within the community are created that instill feelings of personal worth. *Importance* is the feeling of being cared about and valued. *Dependence* is the feeling of being needed. It is evident when one knows that they have a contribution to offer the community and also the feeling that they will receive something beneficial from the community. *Appreciation* is a feeling that one is appreciated by others. *Ego Extension* is the sense of identifying with others and/or the university. It involves believing that someone else

will be also be proud of their successes or sympathize with their failures. Ego extension requires that relationships are built via *attention, importance, dependence, and appreciation*.

Research examining Schlossberg's theory in higher education settings has found that different groups on campus exhibit different levels of sense of mattering. Phillips (2005), in his study of African American students at predominantly white institutions, found that African American students experience lower levels of mattering, or higher levels of marginality. Kodama (2002) found that there were no significant differences in sense of mattering between transfer students and commuter students, although women and Asian American students experienced higher levels of marginality. Cheng (2003) found that students' sense of community is influenced by a sense of mattering, or their feelings of being cared about, treated in a caring way, valued as an individual and accepted as a part of the campus community.

It is important to note that sense of mattering differs from sense of community in that perceptions of mattering occur through individuals' interpretations of the quality and quantity of others' behaviors toward them (Dixon Rayle, 2005), whereas a sense of community is thought to be more group oriented. Using Cheng's (2003) finding, this research examined sense of mattering to others as a potential influence to students' sense of community. If students use IM to supplement face-to-face communication with their friends, family, classmates, etc., and thereby the quantity of interaction, it is hypothesized that the greater the likelihood that students will feel like they matter to each other. If students feel like they matter to each other, it is possible that they will experience a greater sense of community. This theory will lay the foundation to assist in answering two questions: will students who

exhibit different levels of a sense of mattering use IM differently and how much of an influence does students' sense of mattering have on students' sense of community?

General Sense of Mattering Scale

The General Sense of Mattering Scale (Marcus, 1991) will be used to assess Schlossberg's theory of student development that suggests that marginality and mattering are directly related to a sense of community (Schlossberg, 1989). The GMS was developed to assess individuals' feelings that they mattered to other people. The instrument consists of five Likert-type items (e.g. "How much do you feel others would miss you if you went away?") rated on a 4-point scale ranging from 1 = not at all to 4 = very much. A higher score indicates a stronger sense of mattering, or significance to others.

Several studies have used the GMS to evaluate sense of mattering. DeForge & Barclay (1997), in a study of 199 homeless men, found that they mattered to others despite their personal hardships. Connolly and Myers (2003) found that general mattering and wellness were positively related to employees' job satisfaction. Dixon Rayle (2005), in her study of adolescents and various mattering scales, found that females scored higher than males on the GMS scale. Previous studies have not examined if there is a difference between sense of mattering among those who use communication technologies, specifically IM, to create or maintain relationships.

McMillan and Chavis' Psychological Sense of Community

Whereas sense of mattering is the feeling of mattering to another person and most often occurs between two people, a sense of community is conceptualized as the feeling of belonging to larger groups of individuals, or the larger community (Baumeister & Leary,

1995; Dixon Rayle, 2005). Sense of community has been defined as both an outcome of living in a community and as the definition of community itself (Garcia et al., 1999). This definition is important because community psychology purports that the trait that separates societies and groups of people with communities is the “sense of community” (SOC). McMillan and Chavis (1986) expanded on Sarason’s definition of psychological sense of community. According to McMillan and Chavis, a sense of community is experienced when those within the community begin to bond with each other. Bonding can occur over the discovery of similarities. If one can find people with “similar ways of looking, feeling, thinking, and being; then it is assumed that one has found a place where one can safely be oneself” (McMillan, 1996, p. 321). According to McMillan and Chavis (1986), the definition of sense of community “must be explicit and clear; second, it should be concrete, its parts identifiable; third, it needs to represent the warmth and intimacy implicit in the term; and finally it needs to provide a dynamic description of the development and maintenance of the experience” (p.4). Their definition has four elements, or components, which include membership, influence, integration and fulfillment of needs, and shared emotional connection.

The first element, membership, is a “feeling of belonging or of sharing a sense of personal relatedness “ (p. 9). Within membership there are five additional components, boundaries, common symbol system, emotional safety, sense of belonging and identification, and personal investment. Along with a sense of belonging is the impression of *boundaries*. If you are a member of a community, then there are physical or implied boundaries which separate those who belong and those who do not. The implied boundaries are often created

through symbols including dress, language, and rituals. Although members of the groups who instant message do not always see each other, the language the instant messengers use is very distinctive. One study (Baron, 2001), examined how young people use language shortcuts to express themselves in email, IM and text messaging that is using different messaging that may be confusing to outsiders, including older generations now familiar with the symbols. A common symbol system reinforces the existing boundaries that identify members (McMillan & Chavis, 1986, p. 10). These boundaries separate “us from them” and provide protection, whether physically or psychologically, from threats from others. Boundaries can create *emotional safety* in which members are able to express needs and feelings that creates intimacy among its members.

The emotional security that is provided by being a member of a community makes belonging to that community desirable. Crossing the boundaries to gain membership requires *personal investment*. Through personal investment, “membership is more meaningful, and members feel that they have earned a place in the community and have a right to belong” (McMillan & Chavis, 1986, p. 10). Because crossing boundaries requires a certain level of commitment and personal investment, it gives members a sense that they have earned a right to be in that community and establishes a place for them in that community. The new member to the community can begin to identify with the community and feel that they are part of that community; in other words, “it is my community and I am part of the community (McMillan & Chavis, 1986, p. 10).

The second element is community. Community is more attractive when those members believe they will have influence in that community. However, the members who

are most influential are those who are most influenced by the community. These members are those who adhere and conform to the community's established values, ideals, and norms, not those who resist the community's influence. Conformity to these values reinforces community cohesion. Although it would seem that conformity might have negative connotations in higher education, where students are taught to think independently, unity and conformity are a result of consensual validation, or the assumption that people have an innate need to know what other people think, feel and perceive in the same way they do. By creating this intimacy, members create community norms that in turn, create a uniform community. A close-knit community is one in which the members are influenced by the community and influence the community equally.

The third element is integration and fulfillment of needs. The level of reinforcement within a community can be measured by the degree to which the needs of members are fulfilled. Beyond the requirements for basic survival, the needs of members are rooted in their values. Therefore, these shared values of a community become the organizing principle for reinforcement (McMillan & Chavis, 1986, p. 13). The strength of a community depends upon the ability of its members to work together to fulfill their mutual needs.

Shared emotional connection is the fourth element. Shared emotional connection between members involves the sharing of events and creates the subsequent bond that forms. The sharing of events can refer to the present, such as the frequency and quality of member interaction, or can relate to past events, such as a shared history. For new members to experience shared history, they must have backgrounds and experiences similar to those of

existing community members (McMillan & Chavis, 1986, p. 13). Five factors that contribute to shared emotional commitment are:

(1) Contact Hypothesis. As member interaction increases, so does the likelihood of member closeness.

(2) Quality of interaction. As the quality of interactions and relationships increases, so does the bond. As the bond deepens, the community becomes more cohesive.

(3) Closure to events. Interaction ambiguity and incompleteness of group tasks hinder community cohesiveness.

(4) Shared valiant event hypothesis. The more members consider the shared event to be valiant or noble, the greater the community bond.

(5) Investment. The level of community investment indicates the significance of shared history or current community status to the member. The greater time and energy invested, the greater emotional involvement of the member.

Psychological Sense of Community in Education

Although there is a predominance of research on sense of community most of it has focused on neighborhoods and cities. The current research will be best served by the research on sense of community in education, both secondary and post secondary. McCarthy, Pretty, and Catano (1990) used the concept of psychological sense of community to discuss the power of community in supporting students through their educational experiences. The researchers examined the relationship of PSOC to social climate characteristics and found evidence that PSOC is related to undergraduates' interpersonal networks and support. Relative to this study, Pretty, Andrews, and Collett (1994) found a significant negative

correlation between school sense of community and loneliness. Other studies have examined the relationship between PSOC and social predispositions (Davidson, Cotter, & Stovall, 1991), subjective well being (Davidson & Cotter, 1991), and student burnout (McCarthy, Pretty, & Catano, 1990). Sense of community was also found to be a significant influence on intent to return (Berger, 1997; Jacobs & Archie, 2008).

Rovai and Lucking (2003), in studying the relationship of interactions on community in the classroom, developed the Classroom Community Index (CCI). The researchers assessed the degree to which students feel that they are part of a learning community, seemingly due to the importance of socialization. In a similar study of online learners, Rovai and Lucking (2003) researchers found a significant relationship between classroom sense of community and the number of messages posted by the students, indicating a relationship between feelings of community and the information flow among them.

Because this study will also examine technology and PSOC, it is important to review virtual community and how psychological sense of community has been studied in this context. An online community is the group of people who participate in the community network by offering their opinions, by reading and responding to those of others, and by using and providing information and/or services. The online community is at the center of social and political architecture and if this community is inactive or dysfunctional, the entire community network is deficient (Schuler, 1996, p. 255). Virtual settlements differ from virtual communities in that settlements are defined by virtual space whereas virtual community is an online community that experiences a sense of community and where community behaviors occur (Blanchard & Markus, 2004). Blanchard and Markus (2004)

report that SOVC is quite similar to SOC that is found in some communities of place and their SOVC were similar to the descriptive framework of McMillan and Chavis. The researchers also found that virtual community does not also exist in virtual settlements so adding a technology that attempts to encourage interaction among its members are not always successful. IM has been used by students to communicate mainly with friends and other people with whom they have previous interactions; therefore, sense of virtual community as separate from sense of campus community, will not be studied in the current research.

Collegiate Psychological Sense of Community Scale

As has been discussed in earlier sections, sense of community, as defined by McMillan and Chavis (1986), was originally created to study neighborhoods; however, it has been used to study other communities such as the workplace and schools, and more applicably to this research, college campuses. Based on the Sense of Community Index (Chavis, Hogge, McMillan, & Wandersman, 1986), Lounsbury and DeNeui (1996) set out to define further “sense of community” in various settings, namely the university setting. The benefits of this scale are many including; it was defined specifically for colleges and universities and it looked at the whole university as opposed to smaller components of the university such as the residential halls or classrooms (e.g. Rovai’s Classroom Community Index). Lounsbury and DeNeui provide a tool that will inform this research in identifying which student and university characteristics correlate with psychological sense of community. It will be important to my research to evaluate which of these independent variables will be included in this current study.

Lounsbury and DeNeui found that size of institution was a significant factor in predicting students' sense of community. As this research is only investigating sense of community on one campus, this variable will not be included. Students' academic majors were also reported to affect psychological sense of community (Lounsbury & DeNeui, 1995). Lower levels of sense of community were found among students who did not have majors and students in engineering and life sciences. It is expect to find the same in this research so it will not be included in the models.

Lounsbury and DeNeui (1995) found that fraternity/sorority members had a higher mean sense of community than non-members did. This could be explained by the frequency and intensity of social gatherings that foster kinship among students in a Greek organization (small group within the larger community, connection). Jacobs and Archie (2008) also found that Greek association positively influenced sense of community. However, Spitzberg and Thorndike (1992) found that Greek association limits the time that students have to devote to other campus activities or student organizations, thus diminishing their sense of community. Cheng (2003) also found that association with a fraternity or sorority had a negative impact on sense of community. This variable will be included in the activities section of the survey instrument as there is sufficient evidence that this would add to the predictive model.

Another student characteristic that was found by Lounsbury and DeNeui (1995) to be significant is permanent residence. Higher levels of sense of community existed in students out of state than from in state. Although this may seem counterintuitive the authors suggest that the students from out of state rely more on the resources and support found in the campus community than students whose families reside in-state.

Research has shown that those who live on campus and have a positive residential experience will experience a higher sense of community (Lounsbury & DeNeui, 1996) and the researcher concludes that this will also impact the amount of time spent online and using IM. It would be important to examine there is a mean difference in the amount of time spent using IM for those living on campus versus those living off-campus and if that impacts sense of community.

Lounsbury and DeNeui (1995) also reported that freshmen, sophomores and juniors typically had a higher sense of community as compared to seniors. This may be explained by the fact that there are many first year programs sponsored by the university to welcome them to their new environment but by the time that they are seniors there are fewer programs geared to engage them and they are beginning to look to the future and starting the process of separating themselves from the university. Cheng (2003) also found that upperclassmen had diminishing sense of community than underclassmen. This research will include classification as an independent variable to gauge its affect on sense of community.

Younger people use IM more often than older generations; therefore, it is imperative that this research include a test to uncover if age is connected to psychological sense of community in relation to use of IM. Lounsbury and DeNeui did not include this variable but it is pertinent to this research. In addition, the researchers did not evaluate differences in sense of community as a function of race. As differences have been found in Internet usage and race, this variable was added to the evaluation.

Summary

This chapter attempted to construct the conceptual framework necessary to answer the study's research questions. Through a synthesis of the existing research regarding communities, universities as communities, technology's impact in higher education, instant messaging research, student development theory, and psychological sense of community, concepts presented in the introduction are more fully explored, setting the groundwork to employ the methodology described in the next chapter.

CHAPTER 3

METHODOLOGY

This chapter outlines the methodology used in this study, including the research design, population and sample, instrumentation, data collection. The goal of this study was to gather descriptive information about college students' instant messaging use and to explore the relationship between instant messaging use and psychological sense of community. The introduction presented the significance of and need for studying this population and the potential impact instant messaging use could have on students' sense of community and the review of the literature builds on the theoretical foundation by synthesizing existing literature and research findings. This chapter details the methodology that will be utilized to answer the research questions.

Research Design

The current study employed a non-experimental, cross sectional research design (Johnson, 2001; Creswell, 2003) that allows for generalizations from the sample to the population. Cross-sectional, predictive survey designs are suggested when collecting data on many variables simultaneously and for a large group of subjects at one point in time to evaluate individual's attitudes (2003). For this single institution, A random sample of 3,500 students were drawn from the entire population of all full-time, undergraduate students enrolled in degree programs in the Fall 2008 in at North Carolina State University, a large public four-year, primarily residential, very high research activity (The Carnegie Foundation for the Advancement of Teaching, 2009) university. A web-based survey was distributed to the sample and data was collected using a secure online database. To analyze the survey

responses and answer the research questions, this quantitative study applied bivariate and multivariate statistical tests.

Population and Sample

The population for this study was all full-time, degree-seeking undergraduate students enrolled in degree programs in the Fall 2008 semester at North Carolina State University, a large, urban, public institution with very high research activity (The Carnegie Classification of Institutions of Higher Education, 2009). The undergraduate population at the time of the survey distribution was 20,886 students (NC State University Planning and Analysis Fast Facts, 2008). The sample excluded all students under 18 years of age as well as distance education, associate degree seeking and lifelong education students.

The sampling objective was to achieve a representative sample of students who use IM. Caruso and Salaway (2007) observed that 91% of college students use IM. Accounting for students and response rates estimated at 25%, the number of variables and the response rate of web-based instruments (Dillman, 2000; Mitra, A., et al. 2004; DeNeui, 2003), this study surveyed 3,500 students. A sample size of 377 for this study is sufficient to achieve a 95% confidence level with a 5.0% confidence interval for the population.

Instrumentation

The survey instrument contained 20 questions including all 14 items from the Lounsbury and DeNeui's (1996) Psychological Sense of Community scale, all 5 items from the General Sense of Mattering Scale (1991), one question regarding involvement in activities, and five IM usage questions (Appendix A). Two dependent variables (instant messaging use and psychological sense of community) and multiple independent variables

(age, gender, race, classification, college, residential status, permanent status, work part time on campus, work part time off campus, member of fraternity/sorority, member of religious organization, participate in intramural/club sports, participate in other social organization, sense of mattering, IM use, frequency of IM use, duration of IM use, number of people, and types of people) were examined in this study.

Collegiate Psychological Sense of Community

Based on the definitions of Sarason (1974) and McMillan and Chavis (1986), Lounsbury and DeNeui developed the Collegiate Psychological Sense of Community (CSOC) using survey items created by Doolittle and McDonald (1978) and Glynn (1981) in their assessments of psychological sense of community. In the development and subsequent refinement of the CSOC scale, Lounsbury and DeNeui (1996) provide evidence of construct validity. Their work resulted in a 26-item scale to measure psychological sense of community in a college setting. The researchers administered the survey to a convenience sample and then factor analyzed the items using a principal components method with orthogonal rotation. The result of this review was a large, first-order factor containing the 14 items in the current scale. Factor analysis confirmed a single underlying determinant of responses to these items with loadings ranging from .71 to .88 (Lounsbury & DeNeui, 1996). Lounsbury and DeNeui (1996) also report high internal consistency reliability for the Collegiate Psychological Sense of Community Scale, with coefficient alphas ranging from .88 to .92. Internal reliability of the scale was assessed in the current research by calculating Cronbach's alpha coefficients for each scale and is reported in Chapter Four.

The survey included all questions from the CSOC scale. Students were asked to answer 14 questions measured on a 5 point Likert scale (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree). The dependent variable of psychological sense of community use is continuous.

General Sense of Mattering

Based on Schlossberg's Marginality and Mattering theory (1989), the General Sense of Mattering scale developed by Marcus (1991) was used to measure sense of mattering in the study. Factor analysis confirmed a single underlying determinant of responses to these items with loadings ranging from .63 to .79 (Taylor & Turner, 2001). Previous studies have reported Cronbach's alpha values of .78 (Taylor & Turner, 2001), .87 (Connolly & Myers, 2003), and .74 (Dixon Rayle, 2005). Cronbach's alpha coefficients were calculated in the current study and are reported in Chapter Four.

The current survey included all questions from the General Sense of Mattering scale. Students were asked to answer 5 questions measured on a 4 point Likert-type scale (1=not at all, 2=a little, 3=somewhat, 4=a lot). The independent variable of sense of mattering use is categorical (with two levels: high and low) in the first research question and continuous in the second research question.

Activities and Student Characteristics

An additional question asked students to identify if they are involved in activities outside of the classroom. A list of activities, separated into categories identified by the university in their analyses of students, were provided from which the student can select as many or as few as are relevant.

Although not part of the survey instrument, student characteristics were collected. Students used their unity IDs to log into the online survey. These IDs were then matched with the data already on file with University Planning and Analysis (UPA). Age (date of birth that was converted to an age at the time of the survey), gender (Male/Female), race (White, Black, Native American, Hispanic, Asian, International), college (curriculum in which the student is enrolled), classification (Freshman, Sophomore, Junior, Senior), residential status (on-campus in residences owned, operated or affiliated by the university, or off-campus), and permanent address (in-state, out of state/international) were collected from University Planning and Analysis' dataset. All of the demographic items use a categorical scale.

Instant Messaging Usage

Five questions from the 19-item Pew IM usage survey were used in this research. The items regarding IM use were separated into five levels. The first identified if the student has ever used IM. The second assessed the frequency of times logged into an IM client in a week. The next three levels assessed the duration of active use in a day, the number of people with whom students communicated on a regular basis, and the types of people with whom students communicate via IM. Each of the five levels of IM was analyzed independently. One question was modified from the Pew IM survey that asked students to identify the types of people with whom they communicate via IM. As discussed more thoroughly in the review of the literature, IM is used mainly for social purposes; however, some students are using IM to communicate with faculty, classmates and other student services or offices. It was important to distinguish with whom students are speaking via IM to determine whether sense

of community can be affected by moving outside of the close social sphere, to include those from their classes or university staff and administrators. These questions identified those students who use IM, the impact that instant message frequency, instant message duration, the number of contacts contacted via IM, and the types of people contacted via IM had on psychological sense of community.

Data Collection

The researcher filed the necessary Institutional Research Board (IRB) forms and was given permission to conduct the study (see Appendix B). North Carolina State University Planning and Analysis assisted the researcher in collecting the student sample and a confidentiality agreement was filed. Permission was asked of the researcher, John Lounsbury, to use the Collegiate Psychological Sense of Community Scale (CSOC) developed by Lounsbury & DeNeui (1996). Permission was also asked of the primary investigator in the “Pew Internet and American Life Project: How Americans Use Instant Messaging” (2004), Amanda Lenhart, to utilize five questions from the survey regarding IM usage. Written permission from both sources was granted for this study (Appendix C).

During the late Fall 2008 semester, a web-based survey (Appendix A) was emailed to the sample of students. Web-based survey research is an appropriate method for these students as they each have an official email account and are required to use this account for all official business with the university. A web-based survey is also more cost effective, efficient, and has the potential of a higher-return rate than a paper survey, particularly when investigating this population (Zanutto, 2001; Dillman, 2000).

A bulk emailing system was utilized that allowed the researcher to send the email directly from their university affiliated email address to decrease the chances that the email was identified as spam. In the initial email (Appendix D), the students received an invitation to participate as well as the option to remove their email address from subsequent mailings. They were informed that their participation was voluntary and that answers were kept confidential. The email contained instructions on completing the survey with a link that took them to the actual survey instrument. Once at the survey page, the student had to login using their official student ID. The researcher's contact information was provided should the student encounter technical difficulties. There were no requests from students for a paper version of the survey.

The survey remained live for two weeks. Those who had submitted the survey were removed from the email listserv. Two follow-up emails (Appendix E) were sent to all non-responders to encourage them to complete the survey, as recommended by Dillman (2000). One follow-up was sent four days after the initial email and a second follow-up was sent the day before the survey closed. Four bookstore gift certificates of \$50 were used as incentives to increase response rates. Students who had completed the survey were added to the sample from which the winners were chosen. The winners were notified after the survey was closed.

An exemption from the Institutional Research Board (IRB) (Appendix C) was requested from the university to conduct this research. A confidentiality agreement was also submitted to the planning and analysis department for use of the student data on file.

Data Analysis

The data from the surveys was analyzed using SAS v.9.1.3 and SPSS v.16 statistical software. Descriptive statistics of the variables, such as frequencies, as well as inferential statistics, were analyzed.

(1) Are there differences in students' use of IM based on age, gender, race, classification, college, residential status, permanent address, involvement in activities, and sense of mattering? Descriptive statistics will be used to demonstrate instant messaging use by reporting frequencies and means of the IM scale (IM use, frequency, duration, number of people, types of people). Chi-square and separate one way analyses of variance were used to test for significant differences as a function of age, gender, race, classification, college, residential status, permanent address, involvement in activities, and sense of mattering with respect to the dependent variable, IM use (user or not, frequency, duration, number of contacts, types of people).

(2) To what extent does students' IM use influence psychological sense of community after controlling for age, gender, race, classification, college, residential status, permanent address, involvement in activities, and sense of mattering? A total psychological sense of community scale was calculated for each observation by computing the means of all 14 items, with low mean scores indicating a low sense of community and a high mean score indicating a high sense of community. Using the items regarding IM use derived from the IM use scale (Shiu & Lenhart, 2004), hierarchical regression analysis was performed to determine associations between IM use, frequency of IM use, duration of IM use, number of IM contacts and types of IM contacts and sense of community, while controlling for student

demographics, involvement in activities, and sense of mattering. Hierarchical regression adds terms to the regression model in stages. At each stage, additional terms were included in the model and the change in R² was calculated. Each term was entered in four blocks to establish if there was a relationship between the predictor variables (the amount of time spent logging in IM in a typical week, the amount of time spent actively using IM in a typical day, the number of IM contacts, and the types of people with whom students communicate with via IM) and the criterion variable, sense of community.

Dummy Coding

For research question two, categorical variables were dummy coded within the regression model. When a categorical variable has more than two values, it is recoded into multiple dummy variables. In dummy coding, each level of the original categorical variable is represented by a different binary variable. A dummy variable can have only two values: 0 and 1. Categories initially coded as 1 were recoded as 0. Dummy variables were created for gender, race, classification, college, residential status, and permanent residence (see Appendix F). The researcher took levels of these categories and created a variable corresponding to each level, which will have the value of yes or no (i.e. 1 or 0). In other words, one dummy variable was created for gender (male as the reference group), residential status (on campus as the reference group) and permanent residence (in state as the reference group). Three dummy variables were created for classification (freshmen as the reference group).

Limitations

There were several limitations and delimitations to the research methodology that must be addressed. First, this study only examined one institution of higher education that limits the generalizability to other institutions. Because the sample consisted of college students from North Carolina State University, a large, urban, mostly residential university, it is possible that students at other types of universities may have different experiences. Lounsbury and DeNeui (1996) found that psychological sense of community scores were higher at smaller schools and it would be important to investigate these differences in future research.

In addition, the questionnaire items regarding sense of community only had five answer choices that may not encompass students' perceptions on campus community. Although both "neutral" and "don't know" choices were included in the Likert scale, it was possible that students had other answers that could be given as an open-ended question but were not allowed. Also to consider is that the study relies upon self-reporting the use of IM, which is inherently problematic when estimating behavior. Students may have underestimated or overestimated the time they spent using IM, or simply not have been able to distinguish between logged on and active use.

With regards to the types of data collected, academic involvement, specifically the number of hours spent on class assignments outside the classroom, was not within the scope of this study. However, an attempt to gather a piece of this information was included by asking participants to answer whether or not they used IM to communicate with classmates regarding coursework.

CHAPTER 4

RESULTS

The purpose of this study was to understand the extent to which student's psychological sense of community was influenced by IM use using the psychological sense of community theoretical framework created by McMillan and Chavis (1986), Schlossberg's (1989) marginality and mattering theory, and Astin's (1984) involvement theory. The research questions for this study were as follows:

- (1) Are there differences in IM use based on age, gender, race, classification, college, residential status, permanent residence, involvement in activities, and sense of mattering?
- (2) To what extent does IM use influence psychological sense of community after controlling for age, gender, race, classification, college, residential status, permanent residence, involvement in activities, and sense of mattering?

Descriptive Findings

The population for the present study consisted of all full-time, degree-seeking undergraduate students enrolled at NC State University in the fall 2008 semester, which totaled 20,886. The North Carolina State's University Planning and Analysis (UPA) office assisted in deriving the sample using SAS v.9.1.3, a statistical analysis software package, to collect a simple random sample. The sample was drawn from the student record system and reflected the desired population criterion. Three thousand five hundred surveys were emailed to this sample of enrolled undergraduate students. A total of 15 emails were undeliverable and two additional attempts were made to contact these students. These 15 emails were

returned to sender due to an email error of “mailbox full” and were excluded from the total sample. Out of 3,485, there were 875 usable surveys, for a response rate of 25%. This response rate was comparable to other studies whose participants were college students. For example, DeNeui (2003) obtained a college student response rate of 33% using paper-based surveys. Additionally, response rates ranged from 17% to 52% in a web-based data collection methodology used to study alcohol use behavior among college students (Mitra, A., et al. 2004).

The North Carolina University Planning and Analysis office also provided information including age, race, gender, classification, college, permanent residence, and residential status of the participants in the sample. Table 1 in Appendix G illustrates the profiles for the 875 participants as well as the overall population. Almost all of the participants were between 18 and 27 years of age (95.9%). The majority of the participants were female (55.3%), while males represented 44.7% of the participants who responded to the survey. Related to race/ethnicity, the largest percentage of the participants was Non Hispanic White Americans (81%), followed by African Americans (8.2%), Asian/Pacific Islanders (4.9%), Hispanics (2.4%), and American Indian/Alaskans (0.3%). Twenty-seven participants, or 3.1%, were undeclared in terms of race/ethnicity. The distribution for classification, or year in school, was fairly even with 26.1% freshmen, 22.7% sophomores, 23.3% juniors, and 27.9% seniors. Concerning college curriculum area, engineering majors (24.1%), agriculture life sciences majors (22.0%), and humanities majors (20.6%) were fairly evenly distributed, followed by management majors (10.9%), natural resource majors (4.9%), education majors (4.2%), textiles majors (4.1%), physical and mathematical sciences majors

(3.7%), first-year college majors (3.4%), and design majors (2.1%). For residential status, the majority of the participants reported living off campus (58.8%). The majority of participants, 93.2%, reported that their permanent residence was in state while 6.5% were out of state, including international students. Overall, the sample was reflective of the population in all categories except for gender and residential status. A higher percentage of females (55.3%) responded to the survey than the population (44.6%) and more off campus participants (58.8%) responded compared to the population (47.5%). Participants reported their involvement in activities as follows: work part-time off campus (30.0%), work part-time on campus (18.2%), member of a fraternity or sorority (12.1%), participate in intramural/club sports (28.1%), member of a campus religious organization (18.2%), and participate in another social organization (20.5%) not listed (see Table 1 in Appendix G). UPA did not have data regarding involvement in activities for the overall population for comparison purposes.

Participants were asked to answer five questions regarding IM use. Table 2 in Appendix H represents distribution of participants' age, gender, race, classification, college, residential status, permanent residence, and involvement in activities with respect to IM usage. A total of 662, or 75.8%, participants were IM users. Participants who were in the 18-27 year old category who used IM represented 80.7% of the participants while the category of participants 28 and older represented 27.8%. Female and male participants using IM represented 55.7% and 44.3%, respectively. The majority of participants were white (82.9%) followed by minority (14.5%). By classification, or year in school, participants using IM were represented by the following distribution: 24.2% freshmen, 21.8% sophomores, 23.7%

juniors, and 30.4% seniors. By college curriculum or major in which the student is enrolled, participants who used IM were as follows: 23.0% engineering, 21.1% math and sciences, 30.1% humanities, 25.8% other. Participants who lived on campus and used IM represented 39.3%, whereas participants who lived off campus and used IM represented 60.7%. The participants whose permanent address was in state and used IM represented 93.5%, and the participants who resided out of state represented 6.5%.

Although there was a list of 20 activities from which participants could select, only six activities had a sufficient number of responses to include in the study. The participants who participated in these activities and used IM were represented in the following distribution: 23.1% worked part-time off campus; 15% worked part-time on campus; 9.4% member of a fraternity or sorority; 22.5% involved in intramural/club sports; 14.8% member of in a campus religious organization; and 17.0% participated in other campus social organization.

Participants who identified themselves as IM users were then asked to report the number of times they logged into an IM client, the duration of time in a typical day that was spent actively using IM, and the number and types of people with whom they communicated. Details of the distributions of IM use, frequency, duration, number of people, and types of people are located in Tables 3-6 in Appendix H. The majority of participants reported that they logged into an IM client several times a day (29.7%), followed by 16.4% about once a day, 10.2% 1-2 days a week, 8.4% 3-5 days a week, 8.7% every few weeks, and 4.9% less often. Some participants reported that they didn't know how often they logged into an IM account (0.8%).

The majority of participants reported that they spent less than 15 minutes (18.9%) actively sending and receiving IM messages, followed by 11.7% who reported 15 minutes to less than a half-hour, 12.3% who reported half hour or more but less than 1 hour, 10.3% who reported about an hour, 8.7% who reported more than 1 hour but less than 2 hours, 6.4% who reported 2 hours or more but less than 3 hours, 2.5% who reported 3 hours or more but less than 4 hours, and 4.8% who reported 4 hours or more. Some participants reported that they didn't know how long they spent using IM (3.0%).

Most participants used IM to communicate with 3-5 people (36.3%) and 1-2 people (23.9%). A smaller number of participants reported that they communicated with 6-10 people (9.9%), more than 10 (4.0%), and none (2.9%). The lowest percentage of participants reported that they didn't know how many people (1.1%) they communicated with via IM on a regular basis.

It is important to note that for the types of people, participants were allowed to select more than one of the categories. The majority of participants indicated that they communicated with friends who were not at NC State (90%) followed by 64.7% of participants communicating with friends at NC State, 43.6% with their family, 38.7% with their classmates to discuss coursework, 3.8% with their professors/instructors, 2.6% with NC State offices/staff, and 10.2% with others not specified in the survey.

Data Analysis

SPSS v.16, a statistical analysis software package, was used to analyze the respondent data. The coding for variables is located in Table 8 in Appendix I. Most of the variables were recoded using binary coding (0, 1). These changes reflect values that can be analyzed using

the statistical techniques such as regression analysis. Recoding was also necessary to collapse original response categories into more meaningful analytic groups and to meet the assumptions of the statistical tests. Student demographic data that did not have sufficient counts were collapsed into smaller groups. Race/ethnicity was collapsed into white and minority. College was collapsed into four categories: engineering, math and sciences, humanities, and other. Types of people with whom students communicated via IM were collapsed into family, friends at NC State, friends not at NC State, classmates, and other. The other category included professors/instructors, offices/staff, and other.

The data file was reviewed for missing data. If the response to the first question, IM user or not, was no and the following questions regarding IM use were answered, those results were not included in the analyses. Additionally, the answer choices of “don’t know” and “none” were removed from the analyses for the following IM variables: frequency, duration, and number of people. The correlation matrix revealed variables aligned as expected with one another. No variables required removal. A complete correlation matrix is in Table 8 in Appendix I.

Reliability

Two surveys were used to gauge participants’ sense of mattering and sense of community. Construct reliability is a measure of whether a scale measures a construct consistently. Cronbach’s alpha, a measure of internal consistency for a multiple item scale, was used to evaluate the collegiate psychological community scale and the general sense of mattering scale. This strategy correlates the score for each item with the total score for each individual and compares that to the variability present for all individual item scores (De

Vaus, 2002). Cronbach's alpha coefficient values range from 0-1. An alpha coefficient value of .70 or higher is generally acceptable (Nunnally, 1978).

The Collegiate Psychological Sense of Community Scale, a 14-item, five-point Likert scale ranging from 1- 5 (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree), was used in this study to measure psychological sense of community. Lounsbury and DeNeui (1996), in their original study, reported high internal consistency estimates for the Collegiate Psychological Sense of Community Scale, with coefficient alpha coefficients ranging from .88 to .92. Other studies using this scale have calculated the reliability coefficient at .93 (Zapata, 2000). The reliability estimate for this study was .92, a relatively high estimate of internal consistency. Table 9 shows item-to-total correlations for both the original Lounsbury and DeNeui (1996) study and the current study.

Table 9

Comparison of Item-to-Total Correlations for the Psychological Sense of Community Scale

Item	Item-to-Total Correlations	
	Lounsbury & DeNeui, 1996	Present Study
1. I really feel like I belong here.	.71	.83
2. There is a sociable atmosphere on campus.	.56	.75
3. I wish I had gone to another university instead of this one. *	.68	.91
4. Students feel they can get help if they are in trouble.	.47	.77
5. I would recommend this university to students in my high school.	.80	.75
6. My parents like this university.	.49	.70
7. There is a strong feeling of togetherness on campus.	.60	.95
8. I someday plan to give alumni contributions to this university.	.62	.98
9. I really enjoy going to school here.	.79	.81
10. Students here really care about what happens to this university.	.56	.85
11. I feel very attached to this university.	.79	.95

Table 9 (Continued)

Item	Item-to-Total Correlations	
	Lounsbury & DeNeui, 1996	Present Study
12. Campus life is very stimulating.	.59	.88
13. If I were going to college next year, I would go here.	.65	.84
14. There is a real sense of community here.	.66	.87

Note: * Item #3 was reverse scored for analyses.

All item-to-total correlations for the present study were $\geq .70$ except for survey item 6, “My parents like this university.” This item had the lowest score in Lounsbury and DeNeui’s reliability assessment as well. This question may have posed some problems for participants to answer as parents may have been deceased, divorced, and “parents” was plural, meaning it could have not been clear if the answer was referring to both parents or one parent liking the university. Additionally, this question seems least likely to gauge sense of community as it relies on the opinion of someone other than the respondent. All item-to-total correlations from both studies indicate that these survey items are consistent in measuring psychological sense of community. In addition, item-to-total correlations from both studies were similar and consistent, thereby increasing the reliability of the instrument.

The General Sense of Mattering Scale (Marcus, 1991) was used to gauge students’ sense of mattering to others. The GSM scale is a five-item Likert-type scale ranging from 1 - 4 (1 = not at all, 2 = a little, 3 = somewhat, 4 = a lot). Higher scores, e.g. values closer to 4, indicate a greater sense of mattering. Previous studies have reported Cronbach’s alpha values of .78 (Taylor & Turner, 2001), .87 (Connolly & Myers, 2003), and .74 (Rayle, 2005). The reliability estimate for this study was .91, a relatively high estimate of internal consistency

reliability. The item-to-total correlations for this study ranged from .81 to .98, with all of the items being well correlated with the total test (see Table 10).

Table 10

Comparison of Item-to-Total Correlations for the Sense of Mattering Scale

Item	Item-to-Total Correlations	
	Marcus, 1991	Present Study
1. How important do you feel you are to others?	.80	.84
2. How much do you feel others pay attention to you?	.75	.81
3. How much do you feel others would miss you if you went away?	.79	.98
4. How interested are people generally in what you have to say?	.71	.81
5. How much do other people depend on you?	.80	.92

Results - Research Question 1

Research Question 1: Are there differences in IM use based on age, race, gender, classification, college, residential status, permanent residence, involvement in activities, and sense of mattering? To accurately reflect the overall concept of IM usage, five levels were created. The first level of IM usage asked participants if they used IM. Other levels of IM usage asked participants to gauge how frequently they logged on (frequency) and how much time they spent actively using IM (duration). Participants were then asked how many people they communicated with via IM on a regular basis (number of people). The last level of IM usage was the type of people (type of people) with whom participants communicated with via IM.

The chi-square test was used to examine whether there were differences between the demographic variables, participation in activities, sense of mattering, and the first level of IM use – whether or not participants used IM. The chi-square test is used to test for statistically

significant differences between groups and is appropriate when the independent variable has two or more levels and the dependent variable is categorical. A p-value of .05 is a conventionally accepted threshold for statistical significance. Thus, when the p-value from the chi-square test is less than .05, differences between groups are deemed to be statistically significant.

Data used in the chi-square analyses must satisfy several assumptions. The first assumption is that the sample must be randomly drawn from the population. In recognition of this assumption, the data were collected from a random sample that was sufficiently large to avoid Type II errors. The data also meet the second and third assumptions in that the data is reported in raw counts of frequency and the measured variables are independent. The fourth assumption is that the observed frequencies cannot be too small. Cells sizes for race and college had too small of a count, according to the Cochran Criterion for the chi-square test, which requires that no more than 20% of the cells have a count less than 5 (Sall, Lehman, & Creighton, 2001). To resolve this problem categories were combined so that cell sizes were sufficient to conduct the analysis.

IM Use

Table 11 illustrates the chi-square results for differences based on age, gender, race, classification, college, residential status, permanent address, participation in activities, and sense of mattering with respect to IM usage. Based on the results from the chi-square analysis, there was a significant difference between race ($\chi^2 = 5.37, p = .021$) and whether or not participants were IM users. The findings showed that participants who were identified as white (82.9%) were more likely to use IM than minority participants (17.1%). There was also

a significant difference between classification ($\chi^2 = 9.48, p = .024$), or year in school, and whether or not participants were IM users. The findings indicate that seniors (30.4%) were more likely to use IM than freshmen (24.2%), sophomores (21.8%), and juniors (23.7%). A significant difference between residential status and whether or not participants were IM users ($\chi^2 = 4.06, p = .044$) was also found. Participants who reside off campus were more likely to use IM than participants who reside on campus (60.7% and 39.3% respectively).

Table 11

Chi-Square Analysis of Differences Between Subgroups of IM Use (N = 662)

Variable	df	χ^2	p
Age	1	0.001 ^a	.970
Gender	1	0.067 ^a	.796
Race	1	5.367 ^a	.021*
Classification	3	9.484 ^a	.024*
College	3	1.892 ^a	.595
Residential status	1	4.055 ^a	.044*
Permanent residence	1	0.022 ^a	.882
Work part-time off campus	1	0.067 ^a	.796
Work part-time on campus	1	1.158 ^a	.282
Fraternity/sorority	1	0.291 ^a	.590
Intramural/club sports	1	1.180 ^a	.277
Religious organization	1	1.994 ^a	.158
Other social organization	1	3.601 ^a	.058
Sense of mattering	1	2.411 ^a	.575

Note. N = 660. * p < .05. ^a0 cells (0.0%) have expected count less than 5.

One-way analysis of variance (ANOVA) was used to test for significant differences in the mean scores on the dependent variables (frequency of use, duration of use, and number of people) separately. A one-way between groups ANOVA is an appropriate statistical test

when there is one independent variable with two or more levels and one continuous dependent variable (Agresti & Finlay, 1997; De Vaus, 2002). There are four assumptions of ANOVA: a) random sampling from the source population; b) the groups formed by the independent variables are relatively equal in size; c) the groups have similar variances on the dependent variable (or homogeneity of variances); d) the dependent variable has a normal distribution for each value category of the independents. Histograms of the three continuous IM use variables (frequency, duration, and number of people) were generated and examined for normality. These histograms indicated reasonably normal distributions although the majority of responses to questions regarding various aspects of IM use resulted in indicators that were skewed; negatively skewed for frequency and duration and positively skewed for number of people. However, because the sample size was adequate and the distributions were not severely non-normal, the data were determined to be robust to violation (De Vaus, 2002). Once again $p < .05$ was used as the threshold for statistically significant results.

IM Frequency of Use

One-way analysis of variance was used to evaluate differences between group means of the independent variables (student demographic data, participation in activities, and sense of mattering) on the dependent variable, frequency of IM use. Frequency of IM use was treated as a continuous variable ranging from less often, every few weeks, 1-2 days a week, 3-5 days a week, about once a day, to several times a day. Means and standard deviations for groups by age, gender, race, classification, college, residential status, participation in activities, and sense of mattering on the frequency of IM use scale are reported in Table 12.

Generally, there were no differences between groups on frequency of IM use. However, there were two statistically significant results: work part-time off campus ($F(1, 662) = 3.848, p = .050$) and work part-time on campus ($F(1,662) = 4.880, p = .027$). As evident by the cell means, participants who worked park-time off campus logged on fewer times in a week ($M = 4.24, SD = 1.694$) than those who did not work part-time off campus ($M = 4.51, SD = 1.611$). Participants who worked part-time on campus logged on fewer times in a week ($M = 4.14, SD = 1.771$) than those who did not work part-time on campus ($M = 4.49, SD = 1.603$).

Table 12

ANOVA Summary Between Groups for Frequency (N=662)

Variable		Mean	SD	F	p
AGE				.819	.366
	18-27	4.45	1.624		
	28 and older	4.37	1.681		
GENDER				.074	.786
	Male	4.41	1.627		
	Female	4.44	1.653		
RACE				.987	.425
	White	4.45	1.620		
	Minority	4.44	1.567		
CLASSIFICATION				.949	.417
	Freshman	4.30	1.734		
	Sophomore	4.38	1.599		
	Junior	4.42	1.607		
	Senior	4.57	1.617		
COLLEGE				.922	.505
	Engineering	4.27	1.684		

Table 12 (Continued)

Variable		Mean	<i>SD</i>	<i>F</i>	<i>p</i>
COLLEGE	Math and sciences	4.46	1.662		
	Humanities	4.46	1.509		
	Management	4.77	1.583		
	Other college	4.97	1.426		
RESIDENTIAL STATUS				.631	.427
	On campus	4.49	1.627		
	Off campus	4.39	1.650		
PERMANENT ADDRESS				.023	.880
	In state	4.43	1.636		
	Out of state	4.47	1.660		
ACTIVITIES				3.848	.050*
	Do not work part-time off campus	4.51	1.611		
	Work part-time off campus	4.24	1.694		
				4.880	.027*
	Do not work part-time on campus	4.49	1.603		
	Work part-time on campus	4.14	1.771		
				1.073	.301
	Not a member of a fraternity/sorority	4.48	1.614		
	Member of Fraternity/sorority	4.02	1.782		
				.392	.532
	Do not participate in Intramural/club sports	4.45	1.624		
	Participate in Intramural/club sports	4.37	1.681		
				.351	.554
	Not a member of religious organization	4.44	1.646		

Table 12 (Continued)

Variable		Mean	<i>SD</i>	<i>F</i>	<i>p</i>
ACTIVITIES	Member of religious organization	4.35	1.619	2.660	.103
	Do not participate in other social organization	4.48	1.634		
	Participate in other social organization	4.23	1.652		
SENSE OF MATTERING				1.159	.282
	Low level	4.50			
	High level	4.36			

Note. * $p < .05$

IM Duration of Use

Analysis of variance was used to evaluate differences between group means of the independent variables (student demographic data, participation in activities, and sense of mattering) on the dependent variable, duration of IM use. Duration of IM use was treated as a continuous variable and ranged from less than 15 minutes, 15 minutes to about an hour, more than 1 hour but less than 2 hours, 2 hours or more but less than 3 hours, 3 hours or more but less than 4 hours, to 4 hours or more. Means and standard deviations for groups by age, gender, race, classification, college, residential status, participation in activities, and sense of mattering on the frequency of IM use scale are reported in Table 13.

There were two statistically significant results: member of fraternity/sorority ($F(1, 659) = 4.301, p = .038$) and member of other social organization ($F(1, 659) = 5.245, p = .022$). The cell means indicated that participants who are members of a fraternity or sorority use IM for less time in day ($M = 2.96, SD = 2.040$) compared to those who are not members ($M = 3.48, SD = 2.119$). Participants who are members of another social organization use IM

for less time in day ($M = 3.06$, $SD = 1.951$) than those who are not members ($M = 3.52$, $SD = 2.149$). Additionally, worked part-time off campus was highly significant at the $p < .01$ level, $F(1, 659) = 10.119$, $p = .002$. Participants who worked part-time off campus used IM for less time in day ($M = 3.03$, $SD = 1.970$) than those who did not work part-time off campus ($M = 3.59$, $SD = 2.156$).

Table 13

ANOVA Summary Between Groups for Duration (N=662)

Variable	Mean	SD	F	p
AGE			.105	.746
	18-27			
	28 and older			
GENDER			.009	.923
	Male	3.41		
	Female	3.43		
RACE			.913	.472
	White	3.44		
	Minority	3.23		
CLASSIFICATION			.911	.435
	Freshman	3.15		
	Sophomore	3.20		
	Junior	3.68		
	Senior	3.59		
COLLEGE			1.344	.211
	Engineering	3.17		
	Math and sciences	3.51		
	Humanities	3.26		
	Management	3.32		
	Other college	3.66		
RESIDENTIAL STATUS			.925	.337
	On campus	3.32		
	Off campus	3.48		
PERMANENT ADDRESS			1.625	.203
	In state	3.39		
	Out of state	3.83		

Table 13 (Continued)

Variable	Mean	SD	F	p
ACTIVITIES				
			10.119	.002**
Do not work part-time off campus	3.59	2.156		
Work part-time off campus	3.03	1.970		
			1.373	.242
Do not work part-time on campus	3.46	2.088		
Work part-time on campus	3.22	2.222		
			4.301	.038
Not a member of a fraternity/sorority	3.48	2.119		
Member of Fraternity/sorority	2.96	2.040		
			.920	.338
Do not participate in Intramural/club sports	3.47	2.176		
Participate in Intramural/club sports	3.30	1.958		
			.123	.726
Not a member of religious organization	3.43	2.139		
Member of religious organization	3.36	2.015		
			5.245	.022*
Do not participate in other social organization	3.52	2.149		
Participate in other social organization	3.06	1.951		
SENSE OF MATTERING				
			.662	.416
Low level	3.49	2.167		
High level	3.35	2.056		

Note. * $p < .05$. ** $p < .01$

IM Number of People

ANOVA was used to evaluate differences between group means of the independent variables (student demographic data, participation in activities, and sense of mattering) on the dependent variable, number of people. Number of people communicated with via IM was treated as a continuous variable and ranged from 1-2 people, 3-5 people, 6-9 people, or more

than 10 people. Means and standard deviations for groups by age, gender, race, classification, college, residential status, participation in activities, and sense of mattering on the number of people scale are reported in Table 14. Overall, there were no differences between groups on number of people communicated with via IM. However, there was one statistically significant result between groups regarding membership in religious organization ($F(1, 661) = 4.313, p = .038$). Participants who were members of a religious organization ($M = 2.88, SD = .877$) communicated with more people via IM than those participants who were not members ($M = 2.70, SD = .880$).

Table 14

ANOVA Results Between Groups for Number of People (N=662)

Variable	Mean	SD	F	p
AGE				
	18-27			
	28 and older			
GENDER			1.496	.222
	Male	2.80	.931	
	Female	2.88	.835	
RACE			1.235	.291
	White	2.83	.878	
	Minority	2.96	.856	
CLASSIFICATION			1.393	.244
	Freshman	2.85	.881	
	Sophomore	2.81	.881	
	Junior	2.96	.917	
	Senior	2.78	.844	
COLLEGE			1.817	.062

Table 14 (Continued)

Variable	Mean	<i>SD</i>	<i>F</i>	<i>p</i>
COLLEGE				
Engineering	2.73	.869		
Math and sciences	2.81	.811		
Humanities	2.90	.973		
Management	2.92	.759		
Other college	2.95	.908		
RESIDENTIAL STATUS			1.520	.218
On campus	2.80	.828		
Off campus	2.88	.912		
PERMANENT ADDRESS			.015	.903
In state	2.85	.891		
Out of state	2.86	.702		
ACTIVITIES			1.761	.185
Work part-time off campus	2.88	.907		
Do not work part-time off campus	2.78	.812		
			.006	.938
Work part-time on campus	2.85	.874		
Do not part-time on campus	2.84	.907		
			.046	.831
Fraternity/sorority	2.85	.871		
Not member	2.83	.946		
			.005	.943
Intramural/club sports	2.85	.886		
Not Intramural/club sports	2.85	.866		
			4.313	.038*
Religious organization	2.88	.877		

Table 14 (Continued)

Variable		Mean	SD	F	p
ACTIVITIES	Not religious organization	2.70	.880	1.047	.307
	Other organization	2.87	.885		
	Not other organization	2.78	.859		
SENSE OF MATTERING				1.159	.282
	Low level	4.50	1.617		
	High level	4.36	1.657		

Note. * $p < .05$

IM Types of People

The chi-square analysis that tested independence of age, gender, race, classification, college, residential status, permanent address, and activities with respect to types of people is represented in Table 15-19. Types of people included family, friends at NC State, friends not at NC State, people at NC State, and other. Participants could select more than one answer option. Based on the results presented in Table 15, there were no significant differences between student characteristics and participation in activities and communicating with family via IM. There was, however, a significant difference between communicating via IM with friends at NC State and whether the participant was a member of intramural/club sports ($\chi^2 = 4.62, p = .032$). Participants who were members of intramural/club sports were more likely to communicate with friends at NC State (32.5%) than participants who were not members of intramural/club sports (25.4%). A highly significant difference existed between

communicating with classmates via IM and race ($\chi^2 = 8.056, p = .005$). Minority participants (13.3%) were less likely to communicate with classmates than white participants (86.7%).

Table 15

Chi-Square Analysis of Differences Between Subgroups of Family (N=662)

Variable	df	χ^2	p
Age	1	2.840 ^a	.092
Gender	1	.007 ^a	.936
Race	1	.084 ^a	.772
Classification	3	1.905 ^a	.592
College	3	2.395 ^a	.495
Residential status	1	.006 ^a	.937
Permanent residence	1	.017 ^a	.897
Work part-time off campus	1	5.246 ^a	.283
Work part-time on campus	1	1.318 ^a	.251
Fraternity/sorority	1	.033 ^a	.856
Intramural/club sports	1	.788 ^a	.375
Religious organization	1	.528 ^a	.468
Other social organization	1	.014 ^a	.905
Sense of mattering	1	.874 ^a	.488

Note. N = 660. * p = < .05. ^a 0 cells (0.0%) have expected count less than 5.

Table 16

Chi-Square Analysis of Differences Between Subgroups of Friends at NC State (N=662)

Variable	df	χ^2	p
Age	1	.825 ^a	.364
Gender	1	1.325 ^a	.250
Race	1	.371 ^a	.542
Classification	3	2.055 ^a	.561
College	3	.835 ^a	.841
Residential status	1	.206 ^a	.650
Permanent residence	1	.389 ^a	.533
Work part-time off campus	1	.124 ^a	.725

Table 16 (Continued)

Variable	df	χ^2	<i>p</i>
Work part-time on campus	1	3.291 ^a	.070
Fraternity/sorority	1	.039 ^a	.843
Intramural/club sports	1	4.616 ^a	.032*
Religious organization	1	.031 ^a	.859
Other social organization	1	2.475 ^a	.116
Sense of mattering	1	1.435 ^a	.224

Note. N = 660. * $p < .05$. ^a 0 cells (0.0%) have expected count less than 5.

Table 17

Chi-Square Analysis of Differences Between Subgroups of Friends Not at NC State (N=662)

Variable	df	χ^2	<i>p</i>
Age	1	.017 ^a	.895
Gender	1	.104 ^a	.747
Race	1	.508 ^a	.476
Classification	3	.481 ^a	.923
College	3	1.926 ^a	.588
Residential status	1	.559 ^a	.455
Permanent residence	1	.758 ^b	.384
Work part-time off campus	1	.006 ^a	.940
Work part-time on campus	1	.376 ^a	.539
Fraternity/sorority	1	.154 ^a	.695
Intramural/club sports	1	.036 ^a	.850
Religious organization	1	.123 ^a	.726
Other social organization	1	.074 ^a	.786
Sense of mattering	1	.343	.411

Note. N = 660. * $p < .05$. ^a 0 cells (0.0%) have expected count less than 5. ^b 1 cell (20%) have expected count less than 5.

Table 18

Chi-Square Analysis of Differences Between Subgroups of Classmates (N=662)

Variable	df	χ^2	<i>p</i>
Age	1	.659 ^a	.417
Gender	1	.046 ^a	.831
Race	1	8.056 ^a	.005**
Classification	3	4.157 ^a	.245
College	3	1.808 ^a	.613
Residential status	1	.495 ^a	.482
Permanent residence	1	.441 ^a	.507
Work part-time off campus	1	1.474 ^a	.225
Work part-time on campus	1	.036 ^a	.849
Fraternity/sorority	1	.298 ^a	.585
Intramural/club sports	1	4.269 ^a	.059
Religious organization	1	.013 ^a	.997
Other social organization	1	8.850 ^a	.103
Sense of mattering	1	.545	.201

Note. N = 660. * $p < .05$. ** $p < .01$. ^a 0 cells (0.0%) have expected count less than 5.

Table 19

Chi-Square Analysis of Differences Between Subgroups of Other (N=662)

Variable	df	χ^2	<i>p</i>
Age	1	1.796 ^a	.180
Gender	1	1.641 ^a	.200
Race	1	.018 ^a	.893
Classification	3	2.460 ^a	.482
College	3	6.819 ^a	.078
Residential status	1	1.269 ^a	.260
Permanent residence	1	1.626 ^a	.202
Work part-time off campus	1	.744 ^a	.388
Work part-time on campus	1	.020 ^a	.967
Fraternity/sorority	1	3.710 ^a	.054
Intramural/club sports	1	.192 ^a	.662
Religious organization	1	.374 ^a	.541

Table 19 (Continued)

Variable	df	χ^2	<i>p</i>
Other social organization	1	.462 ^a	.497
Sense of mattering	1	.784	.111

Note. N = 660. * *p* < .05. ** *p* < .01. ^a 0 cells (0.0%) have expected count less than 5.

Results - Research Question 2

Research Question 2: To what extent does IM use influence psychological sense of community after controlling for age, gender, race, classification, college, residential status, permanent residence, involvement in activities, and sense of mattering? For research question 2, psychological sense of community was the main dependent variable. First, a total psychological sense of community score was calculated for each observation by computing the sum of all 14 items for each observation. For the five missing values, the total mean score was entered. Mean scores ranged from 1-5, with low mean scores indicating a low sense of community, and high mean scores indicating a high sense of community.

Multiple regression was used to analyze the extent to which IM use influences psychological sense of community after controlling for age, race, gender, college, classification, permanent residence, residential status, involvement in activities, and sense of mattering to others. Multiple regression is the suggested method of analysis to determine “the collective and partial/unique contributions of two or more independent variables, X_i , to the variation of a dependent variable, Y ” (Kerlinger, 1973, p. 5). There are four important assumptions to note when using multiple regression. The first assumption is that there is a linear relationship between the independent variables and the dependent variable. The

second assumption is that residuals are normally distributed. The third assumption is that the residuals are approximately equal for all predicted dependent variable scores (homoscedasticity). The last assumption is that the predictor variables are independent of one another. After an examination of the histogram, residuals plot, and tolerance estimates, the researcher concluded that the data did not violate any of these assumptions.

Hierarchical regression was conducted to determine the influence of the independent variables (demographic information, participation in activities, sense of mattering, and IM use) on participants' psychological sense of community. When using hierarchical regression, the researcher decides on the number and the order in which the predictors are entered into the analysis based on logic or theoretical assumptions. The order in which the blocks were entered into the model for this study was based on theoretical considerations regarding IM use and psychological sense of community discussed in detail in Chapter 2. Blocking in hierarchical regression allows the researcher to control for the effect of some variables while measuring only the observed influence of others. By adding variables to the regression model in stages, it is possible to observe the change in the R^2 value to determine whether the explanatory power of the model is enhanced following the addition of factors.

A total of four blocks were entered into the regression analysis. Student characteristics including age, gender, race, classification, college, residential status, and permanent residence were entered in the first block. The second block included participation in activities. The third block included sense of mattering. The fourth and final block included IM use (frequency of use, duration of use, number of people, and types of people). A summary of the hierarchical regression analysis is in Table 20.

First, student characteristics were entered in the model (Block 1). Regression results indicated that student characteristics accounted for 2.4% of the variance in psychological sense of community. The overall model was not significant ($R^2 = .024$, $F(20, 573) = 0.715$, $p = .813$).

Next, activities were added to the model (Block 2). When these variables were added, the variance explained by the predictors increased by 5%. This change was significant ($\Delta R^2 = 0.50$, $F(28, 565) = 1.164$, $p = .025$), accounting for 7.4% of the total variance explained in psychological sense of community. Most of the increase in R^2 was due to the addition of participation in intramural/club sports ($b = .129$, $p = .003$) and religious organizations ($b = .112$, $p = .008$). Other activities were not significant in the model. Participation in intramural/club sports and religious organizations had a positive influence on psychological sense of community. A possible explanation of this finding is that psychological sense of community for the university as a whole is enhanced by those who experience a stronger psychological sense of community for a smaller group who share similar interests, such as a club sport or religious organization.

When the sense of mattering variable was added to the model, the variance explained by the predictors increased by 13.4%. This change in the amount of variance explained was significant ($\Delta R^2 = 13.4$, $F(29, 564) = 5.118$, $p = .000$). The model, with the addition of sense of mattering, explained 20.8% of the total variance in psychological sense of community. When sense of mattering was added to the model, participation in intramural/club sports ($b = .124$, $p = .002$) was still significant; however, participation in religious activities fell out of the model. In other words, when sense of mattering entered the model it negated the

influence of participating in religious organizations. Participants who participated in a religious organization more closely correlated with sense of mattering, therefore, was not as influential to predicting sense of community.

When IM use variables, including frequency of IM use, duration of IM use, number of people contacted through IM, and types of people were entered in Block 4, an additional 3.3% of variance in psychological sense of community was explained. This change was significant ($\Delta R^2 = .033$, $F(32,561) = 4.936$, $p = .009$). IM use was the key variable of interest in this study. When added to the model, it significantly increased the amount of variance explained in the total model. The increase in R^2 was due to the addition of communicating via IM with family ($b = .103$, $p = .010$) and friends at NC State ($b = .089$, $p = .030$). Participants who communicated with family and friends at NC State via IM tended to have a higher sense of community compared to those who did not. Once IM usage was added to the model the total amount of variance explained in psychological sense of community was 24.1%. In the overall model, participation in intramural/club sports ($b = .120$, $p = .002$) and sense of mattering ($b = .386$, $p = .000$) remained statistically significant, which suggests that these variables are useful in predicting of psychological sense of community, in addition to who participants IM usage.

Despite the modest increase in R^2 value by adding IM usage variables, one can draw meaningful conclusions about the relative explanatory power of IM use on psychological sense of community. The results indicate that student participation in intramural/club sports, a sense of mattering to others, and the use of IM, particularly when using IM to speak with

family and friends at NC State, is influential to psychological sense of community after controlling for background characteristics.

Table 20

Hierarchical Regression for Variables Predicting Psychological Sense of Community (N = 854)

Variable	Block 1			Block 2			Block 3			Block 4		
	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>b</i>	<i>SE b</i>	<i>t</i>
age	-.503	1.892	-.266	-.517	1.868	-.277	-1.141	1.737	-.656	-1.317	1.741	-.756
female	.196	.810	.243	.490	.803	.610	.530	.746	.710	.648	.746	.869
minority	-.035	.157	-.222	-.061	.155	-.390	-.091	.145	-.633	-.087	.146	-.594
engineering	.560	1.054	.531	.211	1.046	.201	.380	.972	.391	.205	.975	.210
math_sci	-.230	.998	-.231	-.385	.988	-.389	-.244	.919	-.266	-.243	.921	-.264
humanities	.328	1.032	.318	-.068	1.026	-.066	-.499	.955	-.522	-.452	.955	-.473
on campus	.427	.879	.486	.085	.871	.097	.047	.810	.058	.260	.816	.319
sophomore	-.162	1.078	-.150	.319	1.072	.298	.572	.997	.573	.392	1.000	.392
junior	-.234	1.149	-.204	-.067	1.133	-.059	.112	1.053	.107	-.017	1.055	-.016
senior	.401	1.131	.354	.891	1.128	.790	1.505	1.050	1.433	1.119	1.058	1.058
out of state	3.415	1.507	2.266	3.463	1.491	2.323	2.634	1.388	1.897	2.617	1.389	1.884
partoff				-.724	.795	-.911	-.517	.739	-.699	-.734	.750	-.978
parton				-.587	.947	-.619	-1.135	.882	-1.286	-1.418	.885	-1.602
fratsor				1.459	1.104	1.322	.185	1.035	.179	-.008	1.038	-.008
club				2.396	.799	3.001**	2.314	.742	3.117**	2.234	.745	2.998**
religio				1.978	.908	2.179**	.611	.857	.713	.487	.858	.568

Table 20 (Continued)

Variable	Block 1			Block 2			Block 3			Block 4		
	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>b</i>	<i>SE b</i>	<i>t</i>
othersoc				1.303	.875	1.488	.148	.823	.180	-.101	.831	-.122
matter							.891	.097	9.216***	.891	.098	9.118***
imuser										.319	1.072	.298
freq										-.268	.269	-.997
duration										-.366	.194	-1.886
numbppl										.329	.442	-.745
typefam										1.756	.679	2.587**
typefrNC										2.056	.944	2.177**
typentNC										0.439	1.154	.381
typeclas										0.045	.691	.064
typeothr										-1.258	.967	-1.301
R ²												
Δ R ²												
<i>p</i>												

Note: * $p < .05$ ** $p < .01$ *** $p = .000$

CHAPTER V

DISCUSSION

This study addressed two research questions: (1) are there differences in students' use of IM based on age, race, gender, classification, college, residential status, permanent address, involvement in activities and sense of mattering and (2) to what extent do students' use of IM influence psychological sense of community after controlling for age, race, gender, classification, college, residential status, permanent address, involvement in activities, and sense of mattering.

Regarding the first research question, the results of the chi-square analyses indicated that there is no difference in IM use by gender (55.5% women and 44.7%). This finding is consistent with Shiu and Lenhart (2004) who found that men and women used IM in equal proportions. However, there was a significant difference in IM use based on race/ethnicity. This result is not surprising as recent reports suggest that the discrepancy between Internet use between whites and minorities still exists for some groups (Horrigan, 2008). For example, 64% of Black, non-Hispanic and 58% of Hispanics use the Internet as compared to 77% White, non-Hispanic (2008). In a prior study by the U.S. Department of Commerce (2004) examining Internet use between 2001 and 2003, Blacks and Hispanics use of the Internet increased at annual rates of 33% and 30 % respectively while Whites and Asian American/Pacific Islanders experienced annual growth rates of 20 %. However, the discrepancy between IM use across ethnic and racial groups found in this study suggest that the "digital divide", a term coined in the 1990s to describe a variety of issues associated with

the use and access to technology resources (Foster & Borkowski 2007), may not be narrowing as fast as was previously thought.

The analyses also indicated that seniors were more likely to use IM than freshmen, sophomores, and juniors. A newly released study by the Pew Internet & American Life Project (Lenhart & Fox, 2009) reporting on the development of the growing use of texting and Twitter (a social networking service where users can share short personal messages, or updates, to their friends), especially among young people, may help explain this phenomenon. As underclassmen were found to be less likely than seniors to use IM, it is possible that a shift in communication technology use is already beginning to occur for incoming undergraduate students.

The results from this study also indicated that students who lived off campus were more likely to use IM than students living on campus. A possible explanation is that IM is providing a way for off campus students to connect with each other virtually regardless of their physical location. Prior research found that students who used IM as part of an online class had more informal and social communication with their classmates and professors than students who did not use IM (Nicholson, 2002). Like students in an online class versus students in a campus based class, students who live off campus may not have as many opportunities for face-to-face interactions with their friends as do those students living on campus and in residence halls. Thus, they may be using IM to stay connected to the campus community.

The results of the analyses of variance indicated that students who worked part-time logged in less frequently and spent less time using IM than those who were not employed

part-time. This finding might be reflective of the time constraints experienced by students who work. Students who work are likely to have less free time (Perna, Cooper, & Li, 2006; Furr & Elling, 2000) and therefore have less time to use IM when coupled with school and the demands of employment.

As evidenced by the responses to the type of people with whom students IM, these findings support the research that IM use is used primarily to communicate with people the students have already met face-to-face (Guidry, 2008; Squires, 2003; Valkenburg & Peters, 2007a; Gross, 2004; Grinter & Palen, 2002). The majority of students in this study communicated with family and friends at NC State and friends not at NC State. Although a smaller percentage of students communicated with classmates via IM, there was a significant difference within race/ethnicity. Fewer minority students communicated with classmates to discuss coursework via IM than did white students. This finding is consistent with other research findings that reported that African Americans, the largest minority in the sample of the current research, were less likely to use the Internet for class work (Pew Internet & American Life Project: African Americans and Internet Use, 2007).

The second objective of this study was to assess the extent to which IM use predicted psychological sense of community above and beyond that of student demographics, participation in activities, and sense of mattering. The results indicated that demographic variables were non-significant in the regression model, accounting for only 2.4% of the variance explained in psychological sense of community. In other words, who students are matters very little to their psychological sense of community on the college campus. What students do on campus seems to have the most influence. Participation in activities, including

participation in intramural/club sports and religious activities, accounted for an additional 5% of the variance explained in psychological sense of community. Sense of mattering improved the explanatory power of the model most substantially, accounting for an additional 13.4% of the variance in psychological sense of community. When IM use variables were added to the model already containing the demographics, student activities and sense of mattering, an additional 3.3% of variance in psychological sense of community was explained. In the overall model participation in club sports, sense of mattering, communicating with friends at NC State and family via IM were the only significant predictors of psychological sense of community. IM use had a positive but insignificant relationship to psychological sense of community. Most notably, it was not found that IM detracts from students' psychological sense of community.

These findings conflict with prior research by Lounsbury and DeNeui (1996) regarding student demographics' influence on psychological sense of community. They reported that students who were upperclassmen, engineering and science majors, living off campus, whose permanent address was in state, and not members of a fraternity or sorority, exhibited lower means of psychological sense of community. In the current study, there were no statistically significant differences in psychological sense of community based on age, gender, race, classification, college, residential status, or permanent address.

An interesting finding that was not expected was that participation in club sports made a unique contribution to the prediction of psychological sense of community, above and beyond what it shares in the prediction with the other variables in the final model. In general, the data regarding intramural/club sports supports Astin's (1984, 1997) theory that

students who participate in campus activities are more engaged and experience a greater psychological sense of community during their undergraduate matriculation. The psychological sense of community these students are experiencing may be attributed to the “the camaraderie developed through participation in club sports extends beyond the playing field” (Davis, 2007, p.12). This research supports anecdotal claims that participation in club sports “builds community and creates a sense of belonging” (Tulane University Club Sports, 2009) and “provides opportunities for students and staff to interact outside of the classroom” (Howard University Student Activities, 2009).

As expected, sense of mattering was a significant contributor to psychological sense of community. Sense of mattering had the greatest influence on psychological sense of community and supports research that states psychological sense of community is significantly enhanced by individual feelings of mattering to others (McMillan & Chavis, 1986; Rovai, 2002; Royal & Rossi, 1995). The findings also support research findings that students' psychological sense of community is most closely associated with sense of mattering, or feelings of being cared about and valued as an individual and accepted as a part of the campus community (Cheng, 2003). As discussed in more detail in Chapter 2, a sense of mattering occurs through individuals' interpretations of the quality and quantity of others' behaviors toward them (Dixon Rayle, 2005), whereas a sense of community is more group-oriented. The results of this study confirm that students who feel as though they matter to one another on the individual level experience higher levels of psychological sense of community.

A key finding of this research conflicts with much of the existing literature that focuses

on the negative impact the Internet has had on students' connectivity to the "real world" and the formation of genuine relationships with others (Nie, 2001; Nie & Hillygus, 2002; Mesch & Talmud, 2006). These researchers argued that Internet use, including computer-mediated communication, detracts from face-to-face time with others, which weakens the psychological sense of community among students. However, the findings in this study were more consistent with other research claiming that computer-mediated communication has positive effects on community interaction and involvement (Hampton & Wellman, 2003; Kavanaugh, Carroll, Rosson, Zin, & Reese, 2005). This study reinforces claims that students are being positively influenced, in the form of a greater psychological sense of community, by using IM to communicate (Nicholson, 2002; Jeong, 2007).

Further, results from this study support findings that students' connections to family and friends contribute to their psychological sense of community (Maher, 2004; Noel, Levitz, & Saluri, 1991; Pascarella & Terenzini, 1991). Students who communicated with friends at NC State and family via IM tended to have a higher psychological sense of community than those who did not. Especially true for students who are experiencing a transition such as leaving high school to begin college or transferring schools, IM provides a method in which students can remain close to their families, friends from home or their previous institution (Cummings, Lee, & Kraught, 2006).

Directions for Future Research

The findings of this study represent new and important information regarding students' IM use and psychological sense of community. However, the study has room for improvement. Future research should include direct observation of IM use. The relative high

frequency of the selection of the “don’t know” for number of times logged in and spent actively using IM indicates that students may not be completely aware of how much time they are actually spending communicating online.

Also, because IM usage was limited to frequency, duration, number of people, and types of people, future studies should include qualitative analysis that concentrates on the types of information students communicate via IM. Research that examines the content of the conversations could expose additional differences in how students use IM. Further, a qualitative approach to these research questions could provide insight into the topics that are being discussed in students’ IM conversations and what influence this has on psychological sense of community.

There are also several ways in which the current data could be treated in future research. As there were more female and participants living off campus in the sample than are present in the population, data weighting could be utilized. Data weighting, also known as sample-balancing, adjusts the raw survey data to represent the population from which the sample is drawn. Weighting the sample to reflect the correct proportions of student in the population could enhance the findings’ generalizability. Also, the regression model in this research does not currently explore interactions between race/ethnicity and IM use and psychological sense of community. A suggestion for future research would be to add interaction terms to the regression model that would investigate the combined effect of two variables, i.e. race and IM Use, on the dependent variable, i.e. psychological sense of community, over and above their separate effects.

Future research should also attempt to more closely examine the digital divide that was illuminated in this study. An area that might be of particular interest would be to investigate whether socioeconomic status is related to IM use or nonuse. Also, the response rates from particular racial/ethnic groups were relatively low in this study and were combined into one category, minority, to meet the assumptions of statistical analyses; however, there might be specific differences that exist among racial/ethnic groups which could not be accounted for because of these small sample numbers. Targeted research that looks at specific races/ethnicities, IM use and sense of community could assist those within higher education in addressing the digital divide that exists on campus.

One major challenge to this study was defining psychological sense of community within a university context. For the purposes of this study, students were asked to report their psychological sense of community with the university as a whole, rather than with smaller subgroups that exist and with which the student may more closely identify. Future research should look to distinguish between a psychological sense of community with the university and a psychological sense of community with other types of communities.

Finally, it is essential for student affairs professionals to keep in mind that technology is constantly evolving. The profile of how college students are using technology to communicate may change dramatically over the next decade. Findings may differ from the conclusion of one study to the next; however, this does not eliminate the need for continued focus on technology as its impact on student success.

Implications

Several implications for theory and practice can be gathered from the results of this study. First, the results of this study support the use of the Collegiate Psychological Sense of Community scale to assess psychological sense of community as influenced by students' use of communication technology. The resulting model contributes to the scholarly discussion regarding community within the context of using technology to build and maintain relationships. These findings have implications for student affairs practitioners in their decision-making concerning how to use technology to provide developmental programs and student services.

This study found 75.8% of students at North Carolina State University use IM, which is similar to the findings by Caruso & Salaway (2007) and Junco and Mastrodicasa (2007) that report that a majority of college students use IM. With such a large proportion of college students using IM, it is imperative that student affairs professionals continue to explore how students use technology, particularly the technologies they use to communicate with each other. As Heiberger and Harper (2008) stress, student affairs professionals should be “encouraged to refine and remodel academic and social systems to include structures for learning and development within the technological world in which we, but particularly students, live” (p. 14). Continued assessment of the various communication technologies students use can help these professionals decide how and if certain technologies, like IM, should be used to provide student services and programs. The difference in IM use between seniors and underclassmen and whites and minorities should prompt educators to closely

monitor trends in technology with the caveat of how these technologies are impacting student development for different types of students.

Vincent Tinto (1993), one of the premier researchers on college student retention in the United States, has established that a common element of effective retention programs involves connecting with students to establish strong ties among and between students, faculty, and staff. Consequently, Tinto encourages creating a psychological sense of community on college campuses as a way to help students feel a sense of belongingness and to encourage their personal growth and academic development (Spann, 1990). However, the student affairs' literature is limited in its definition of community (Bishop & Vicary, 2003). College administrators must continue to find avenues to promote students' psychological sense of community understanding that community may have a new meaning for incoming undergraduate students. One of these avenues could include finding new ways to incorporate IM as a vehicle to providing student support. According to Barratt (2001), information technology in student affairs is not yet used to full advantage or potential.

Summary

The purpose of this study was to gather descriptive information about college students' use of IM and to explore the relationships between IM use and psychological sense of community. The final chapter of this research presented an overview of the study, the implications for researchers and practitioners based on the findings of the statistical analyses, and made recommendations for future research. The results of this study demonstrate that IM use among undergraduates was significantly associated with psychological sense of community.

REFERENCES

- Agresti, A., & Finlay, B. (1997). *Statistical methods for the social sciences*. Upper Saddle River, NJ: Prentice Hall.
- Ahlbrandt, R.S., & Cunningham, J.V. (1979). *A new public policy for neighborhood preservation*. Westport, CT: Praeger Publishers.
- Anderson, K.J. (2001). Internet use among college students. *Journal of American College Health*, 50(1), 21-26.
- Arboleda, A, Wang, Y, Shelley, M.C., & Whalen, D.F. (2003). Predictors of Residence Hall Involvement. *Journal of College Student Development*.
- Artinger, L., Clapham, L., Hunt, C., Meigs, M., Milord, N., Sampson, B., Forrester, S. (2006). The Social Benefits of Intramural Sports. *NASPA Journal*, 43(1), 69-86.
- Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, 25, 297-308.
- Astin, A.W. (1993). *What matters in college?: Four Critical Years revisited*. San Francisco, CA: Jossey-Bass Publishers.
- Astin, A. W. (1996). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development*, 37, 123-134.
- Astin, A. W. (1999). Student involvement: A developmental theory for higher education. *Journal of College Student Development*, 40, 518-529.
- Bachrach, K.M., & Zautra, A.J. (1985). Coping with a community stressor: The threat of a hazardous waste facility. *Journal of Health & Social Behavior*, 26(2), 127-141.

- Baron, N.S. (2001). Alphabet to Email: How Written English Evolved and Where It's Heading. *TESOL Quarterly*, 35(2), 349-350.
- Baron, N.S., Squires, L., Tench, S., & Thompson, M. (2003). Tethered and mobile? Use of away messages in instant messaging by American college students. *Paper presented to Front Stage – Back Stage: Mobile communication and the renegotiation of the social sphere*. June 22, 2003. Grimstad, Norway.
- Barratt, W. (2004). Digital Showcase: Let's Chat Yahoo! Messenger and AIM. *Student Affairs Online*, 5(1). Retrieved June 20, 2008 from http://www.studentaffairs.com/ejournal/Winter_2004/DigitalShowcase.html.
- Baym, N. (1995). The emergence of community in computer-mediated communication. In S.G. Jones (Ed.), *Cybersociety: Computer mediated communication and community*. Thousand Oaks, CA: Sage.
- Bell, C., & Newby, H. (1972). *Community studies: An introduction to the sociology of the local community*. New York: Praeger Publishers.
- Berger, J.B. (1997). Students' Sense of Community in Residence Halls, Social Integration, and First-Year Persistence. *Journal of College Student Development*, 38(5), 441-52. Retrieved July 12, 2008 from http://findarticles.com/p/articles/mi_qa3752/is_199709/ai_n8779877.
- Bishop, B., & Vicary, D. (2003). Paradoxes, parables and conundrums: A new sense of community? Network, *The Journal of the College of Community Psychologists*, 14(1). 33-37.

- Blais, J. J., Craig, W. M., & Pepler, D. (2007). Adolescents Online: The Importance of Internet Activity Choices to Salient Relationships. *Journal of Youth and Adolescence*, 37(5), 522-536.
- Blanchard, A.L., & Markus, M.L. (2004). The experienced “sense” of a virtual community: characteristics and processes. *The DATA BASE for Advances in Information Systems*. 35(1), 66-79.
- Bowling Green State University (2008). Residence Life Home. Retrieved June 24, 2008 from <http://www.bgsu.edu/offices/sa/reslife/>
- Boyer, E. (1987). *College: The undergraduate experience in America*. New York: Harper and Row. Retrieved June 30, 2008 from <http://www.naples.cc.sunysb.edu/Pres/boyer.nsf>.
- Buckner, J. (1988). The development of an instrument to measure neighborhood cohesion. *American Journal of Community Psychology*, 16, 771-791.
- Bugeja, M. (2005). *Interpersonal divide: The search for community in a technological age*. Oxford, England: Oxford University Press.
- Campbell, A.J., Cumming, S.R., & Hughes, I. (2006). Internet use by the socially fearful: Addiction or therapy? *Cyberpsychology and Behavior*, 9(1), 69-81.
- The Carnegie Foundation for the Advancement of Teaching (2009). Carnegie Classifications North Carolina State University. Retrieved November 12, 2008 from <http://www.carnegiefoundation.org/classifications/sub.asp?key=748&subkey=15570&start=782>

- Caruso, J.B., & Salaway, G. (2007). *Highlights of the 2007 ECAR Study of Students and Information Technology*. Presentation at the ECAR Symposium, Boca Raton, FL, December 5-7, 2007. Retrieved July 12, 2008 from <http://www.educause.edu/ecar>.
- Chavis, D., & Pretty, G. (1999). Sense of community: Advances in measurement and application. *Journal of Community Psychology*, 27, 635-642.
- Cheng, D. X. (2003). Students' Sense of Campus Community: What it Means, and What to do About It. *NASPA Journal*, 41(2). Retrieved November 22, 2008, from <http://publications.naspa.org/naspajournal/vol41/iss2/art2>
- Chickering, A.W., & Ehrmann, S.C. (1996). Implementing the seven principles: Technology as lever. *AAHE Bulletin*, 3-6. Retrieved Jun 30, 2008 from <http://tltgroup.org/programs/seven.html>.
- Chu, E. (2003). A note to Mom: Why I use instant messaging. *Mercury Project for Instant Messaging Studies*. Retrieved June 28, 2008 from <http://www.stanford.edu/class/pwr3-25/group2/projects/chu.html>
- Cohn, E.R. (2002). Instant Messaging in Higher Education: A New Faculty Development Challenge. Retrieved June 22, 2008 from:
168.144.129.112/Articles/INSTANT%20MESSAGING%20IN%20HIGHER%20EDUCATION.rtf.
- Connolly, K.M., & Myers, J.E. (2003). Wellness and mattering: the role of holistic factors in job satisfaction. *Journal of Employment Counseling*, 40, 152-162.

- Contreras-Castillo, J., Favela, J., Perez-Fragoso, C., & Santamaria-del-Angel, E. (2004). Informal interactions and their implications for online courses. *Computers & Education, 42*(2), 149-168.
- Contreras-Castillo, J., Perez-Fragoso, C., & Favela, J. (2006). Assessing the use of instant messaging in online learning environments. *Interactive Learning Environments, 14*(3), 205-218.
- Creswell, J.W. (2003). Research design. Qualitative, quantitative and mixed methods approaches. Thousand Oaks, CA: Sage.
- Cummings, J.N., Lee, J.B., & Kraught, R.E. (2006). *Computers, phones, and the Internet: domesticating information technology*: Oxford University Press.
- Davidson, W., & Cotter, P. (1986). Measurement of sense of community within the sphere of city. *Journal of Applied Social Psychology, 16*, 608-619.
- Davidson, W., Cotter, P., & Stovall, J. (1991). Social predispositions for the development of sense of community. *Psychological Reports, 68*, 817-818.
- Davis, N. (2009). The other club scene. *Diverse Issues in Higher Education*. Retrieved February 24, 2009 from http://www.diverseeducation.com/artman/publish/article_7186.shtml
- DeForge, B.R., & Barclay, D.M. (1997). The internal reliability of a general mattering scale in homeless men. *Psychological Reports, 80*, 429-430.
- Dalgarn, M. K. (2001). The role of the campus recreation center in creating a community. *Recreational Sports Journal, 25*(1), 66-72.
- DeNeui, D.L. (2003). An investigation of first-year college student's psychological sense of

- community on campus. *College Student Journal*. Retrieved May 25, 2008 from http://findarticles.com/p/articles/mi_m0FCR/is_2_37/ai_103563747
- Devlin, A.S., Donovan S., & Nicolov, A. (2008). Residence Hall Architecture and Sense of Community: Everything Old Is New Again. *Environment and Behavior*, 40(4), 487-521.
- Dillman, D.A.(2000). *Mail and Internet survey: the tailored design method*. New York: John Wiley & Sons.
- Dixon Rayle, A. (2005). Adolescent gender differences in mattering and wellness. *Journal of Adolescence*. 28(6), 753-763.
- Doolittle, R., & MacDonald, D. (1978). Communication and a sense of community in a metropolitan neighborhood: A factor analytic examination. *Communication Quarterly*, 26, 2-7.
- Farmer, R. (2005). IM Online! RU?. *EDUCAUSE Review*, 40(6), 49-50, 52, 54, 56, 58, 60, 62.
- Farrell, E.F. (2007). Tangled Up in Tech. *Chronicle of Higher Education*, 53(28). Retrieved October 12, 2008 from <http://chronicle.com.www.lib.ncsu.edu:2048>.
- Farrington, G.C. (1997). Higher education in the information age. In D. G. Oblinger & S. C. Rush (Eds.). *The learning revolution: The challenge of information technology in the Academy*. Boston, MA: Anker Publishing Company, Inc.

- Flowers, L., Pascarella, E. T., & Pierson, C. T. (2000). Information technology use and cognitive outcomes in the first year of college. *The Journal of Higher Education*, 71(6), 637-667.
- Foster, S., & Borkowski, A. (2007). *Who Coined the Term?*, Retrieved February 28, 2009 from http://www1.soc.american.edu/students/ij/co_3/digitaldivide/history.htm
- Furr, S. R., & Elling, T. W. (2000). The influence of work on college student development. *NASPA Journal*, 37, 454-470.
- Gemmill, E.L., & Peterson, M. (2006). Technology Use Among College Students: Implications for Student Affairs Professionals. *NASPA Journal*, 43(2), Art. 5. Retrieved May 15, 2008, from <http://publications.naspa.org/naspajournal/vol43/iss2/art5>
- Glynn, T.J. (1981). Psychological sense of community: Measurement and application. *Human Relations*, 34, 780-818.
- Glynn, T.J. (1986). Neighborhood and sense of community. *Journal of Community Psychology*, 14, 341-352.
- Grinter, R. E., & Eldrige, M. (2001). Y do tngrs luv 2 txt msg? In W. Prinz, M. Jarke, Y. Rogers, K. Schmidt and Wulf (Eds), *Proceedings of the Seventh European Conference on Computer-Supported Cooperative Work ECSCW 01, Bonn, Germany*. Dordrecht, Netherlands: Kluwer Academic Publishers.
- Grinter, R.E., & Palen, L. (2002). Instant Messaging in teen life. *Proceedings of the 2002 ACM Conference on Computer Supported Cooperative Work*. Retrieved May 25, 2008, from

- http://portal.acm.org/ft_gateway.cfm?id=587082&type=pdf&coll=Portal&dl=ACM&CFID=29733676&CFTOKEN=51420973
- Gross, E. F. (2004). Adolescent Internet use: What we expect, what teens report. *Applied Developmental Psychology, 25*(6), 633-649.
- Gross E.F; Juvonen.; Gable S.L. (2002). Internet Use and Well-Being in Adolescence. *Journal of Social Issues, 58*(1), 75-90.
- Guidry, K.R. (2008). Instant Messaging: Its Impact on and Recommendations for Student Affairs. *Student Affairs Online, 5*(4), Retrieved May 22, 2008 from:
http://studentaffairs.com/ejournal/Fall_2004/InstantMessaging.html
- Gusfield, J. R. (1975). *The community: A critical response*. New York: Harper Colophon.
- Haberkorn, J. (2004). Colleges Reach Out via Instant Messaging. *Washington Times*, June 24, 2004, Retrieved May 22, 2008 from: <http://washtimes.com/business/20040623-114522-1105r.htm>
- Harrington, P. (1997). *Community: Language and ideology*. In C. Bell (Ed.), *Community issues in New Zealand*. Annandale: Federation Press.
- Harris, B. A. (2006). The Importance of Creating a "Sense of Community". *Journal of College Student Retention: Research, Theory & Practice, 8*(1), 83-105.
- Hassinger, E.W., & Pinkerton, J.R. (1986). *The Human Community*. New York: McMillan Publishing Co.
- Haythornthwaite, C. (2001). Introduction: The Internet in everyday life. *American Behavioral Scientist, 45*(3), 363-382.

- Heiberger, G., & Harper, R. (2008). Have you facebooked Astin lately? Using technology to increase student involvement. *New Directions for Student Services, 124*, 19-35.
- Herring, S. (1996). Posting in a Different Voice: Gender and Ethics in Computer-Mediated Communication. In C. Ess (Ed.), *Philosophical Perspectives on Computer-Mediated Communication* (pp. 115-145). Albany: State University of New York Press.
- Hill, J.L. (1996). Psychological sense of community: Suggestions for future research. *Journal of Community Psychology, 24*, 431-438.
- Hiltz, S.R. (1998). *Collaborative learning in asynchronous learning networks: Building learning communities*. Paper presented at 1998 World Conference of WWW, Internet and Internet Proceedings, Orlando, FL.
- Hirt, J., Cain, D., Bryant, B., & Williams, E. (2003). Cyberservices: What's important and how are we doing? *NASPA Journal, 40* (2) 98-118.
- Horrigan, J. (2008). Home Broadband 2008. *Pew Internet and American Life Project*. Retrieved January 24, 2009 from <http://www.pewinternet.org/Reports/2008/Home-Broadband-2008.aspx>
- Howe, N., & Strauss, W. (2003). *Millennials go to college – strategies for a new generation on campus: Recruiting and admissions, campus life, and the classroom*. Great Falls, VA: American Association of Collegiate Registrars and Admissions Officers.
- Hu, Y., Fowler Wood, J., Smith, V., & Westbrook, N. (2004). Friendships through IM: Examining the relationship between instant messaging and intimacy. *Journal of Computer-mediated Mediated Communication, 10*(1).
- Hunter, A. (1975). The loss of community: An empirical test through replication.

American Sociological Review, 40, 537-552.

Isaacs, E., Walendowski, A., Whittaker, S., Schiano, D.J., & Kamm, C. (2002), The character, functions, and styles of instant messaging in the workplace, *Proc. CSCW 2002*, 11-20.

Jackson, M. (2008). *Distracted: The Erosion of Attention and the Coming Dark Age*. New York: Prometheus Books.

Jacobs, J., & Archie, T. (2008). Investigating sense of community in first-year college students. *Journal of Experiential Education*. 30(3), 282-285.

Jason, L.A., & Kobayashi, R.B. (1995). Community building: Our next frontier. *The Journal of Primary Prevention*, 15(3), 195-208.

Jeong, W. (2007). Instant Messaging in On-Site and Online Classes in Higher Education. *EDUCAUSE Quarterly*, 30(1). Retrieved January 21, 2009 from <http://connect.educause.edu/Library/EDUCAUSE+Quarterly/InstantMessaginginOnSitea/40014>

Johnson, R. B. (2001). Toward a new classification of non-experimental quantitative research. *Educational Researcher*, 30(2), 3-13.

Jones, E.L. (1997). *The Student Personnel Point of View*. Retrieved May 30, 2008 from http://www.naspa.org/gradprep/StudAff_1937.pdf

Jones, S. (2002). The Internet Goes to College: How Students Are Living in the Future with Today's Technology. *Pew Internet and American Life Project*. Retrieved June 21, 2008 from <http://www.pewinternet.org/Reports/2002/The-Internet-Goes-to-College.aspx>

Junco, R. (2005). Technology and today's first-year students. In M.L. Upcraft, J.N. Gardner, B.O. Barefoot, & associates (Eds.), *Meeting challenges and building*

- support: Creating a climate for first-year student success* (pp. 221-238). San Francisco: Jossey-Bass.
- Junco, R., & Mastrodicasa, J. (2007). *Connecting to the Net generation: What higher education professionals need to know about today's college students*. Washington, DC: National Association of Student Personnel Administrators.
- Katz, J. E., & Rice, R.E. (2002). *Social Consequences of Internet Use: Access, Involvement, and Interaction*. Cambridge: The MIT Press, 2002.
- Kelly, R. (2009). Nine Strategies for Using IM in Your Online Course. *Asynchronous Learning and Trends, Distance Learning, Online Education*. Retrieved February 20, 2009 from <http://www.facultyfocus.com/articles/asynchronous-learning-and-trends/nine-strategies-for-using-im-in-your-online-course/>
- Koch, W. H., & Pratarelli, M. E. (2004). Effects of intro/extraversion and sex on social Internet use. *North American Journal of Psychology*, 6, 371-382.
- Kodama, C. M. (2002). Marginality of Transfer Commuter Students. *NASPA Journal*, 39(3), Art. 5. Retrieved February 15, 2009, from <http://publications.naspa.org/naspajournal/vol39/iss3/art5>
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53(9), 1017-1031.
- Kretovics, M. (2005). The Role of Student Affairs in Distance Education: Cyber-Services or Virtual Communities. *Online Journal of Distance Learning Administration*, 6(3).

- Retrieved May 25, 2008 from
<http://www.westga.edu/~distance/ojdla/fall63/kretovics63.html>
- Kruger, K. (2005). Technology Issues and Challenges in Student Affairs. *New Directions for Student Services*, 112(4).
- Kubey, R., Lavin, M., & Barrows, J. (2001). Internet use and collegiate academic performance decrements: early findings. *Journal of Communication*, 51(2), 366-382.
- Kuh, G.D. (1991). *Involving colleges: Successful approaches to fostering student learning and development outside the classroom*. San Francisco: Jossey-Bass.
- Kuh, G. D., & Hu, S. (2001). The Relationship between Computer and Information Technology Use, Selected Learning and Personal Development Outcomes, and Other College Experiences. *Journal of College Student Development*, 42(3), 217-32.
- Kuh, G.D., Kinzie, J., Schuh, J., Whitt, E., & Associates. (2005). *Student success in college: Creating conditions that matter*. San Francisco: Jossey-Bass.
- Kuh, G.D., & Vesper, N. (2001). Do computers enhance or detract from student learning? *Research in Higher Education*, 42(1), 87-102.
- LaRose, R., Eastin, M. S., & Gregg, J. (2001). Reformulating the Internet paradox: Social cognitive explanations of Internet use and depression. Retrieved July 2, 2008, from <http://www.behavior.net/JOB/v1n2/paradox.html>
- Lenhart, A., & Fox, S. (2009). Twitter and status updating. *Pew Internet & American Life Project*. Retrieved March 1, 2009 from <http://www.pewinternet.org/Reports/2009/Twitter-and-status-updating.aspx>.

- Lenhart, A., & Madden, M. (2007). Social Networking Web sites and Teens: An Overview. *Pew Internet and American Life Project*. Retrieved July 11, 2007, from http://www.pewinternet.org/pdfs/PIP_SNS_Data_Memo_Jan_2007.pdf.
- Lewis, J., Coursol, D., & Khan, L. (2001). College students@tech.edu: A Study of Comfort and the Use of Technology. *Journal of College Student Development*, 42(6), 625-31.
- Light, R.J. (2001). *Making the most of college-Students speak their minds*. Cambridge, MA: Harvard University Press.
- Lloyd, J. M., Dean, L. A., & Cooper, D. L. (2007). Students' Technology Use and Its Effects on Peer Relationships, Academic Involvement, and Healthy Lifestyles. *NASPA Journal*, 44(3), 481-495 2007.
- Long, D. A., & Perkins, D. D. (2003). Confirmatory Factor Analysis of the Sense of Community Index and development of a brief SCI. *Journal of Community Psychology*, 31, 279-296.
- Lounsbury, J.W., & DeNeui, D. (1995). Psychological sense of community on campus. *College Student Journal*, 29, 270-277.
- Lounsbury, J.W., & DeNeui, D. (1996). Collegiate psychological sense of community in relation to size of college/university and extroversion. *Journal of Community Psychology*, 24(4), 381-395.
- Lovejoy, T., & Grudin, J. (2003). Messaging and Formality: Will IM follow in the footsteps of email? *Microsoft*. Retrieved June 28, 2008 from <http://research.microsoft.com/users/jgrudin/publications/org-use/LovejoyIM.pdf>
- Maher, M.A. (2004). What really happens in cohorts. *About Campus*, 9(3), 18-23.

- Marcus, F.M. (1991). *Mattering: Its measurement and theoretical significance*. Paper presented at the annual meeting of the Eastern Sociological Association, Cincinnati, OH.
- Matei, S., & Ball-Rokeach, S. J. (2001). Real and virtue social ties: Connections in the everyday lives of seven ethnic neighborhoods. *American Behavioral Scientist*, 45(3), 550-564.
- Matthews, D., & Schrum, L. (2003). High-speed internet use and academic gratifications in the college resident. *Internet and Higher Education*, 6, 125-144.
- McCarthy, M., Pretty, G., & Catano, V. (1990). Psychological sense of community and burn-out. *Journal of Community Psychology*, 18, 211-216.
- McMillan, D. (1996). Sense of community. *Journal of Community Psychology*, 24, 315-325.
- McMillan, D., & Chavis, D. (1986). Sense of community: A definition and theory. *Journal of Community Psychology*, 14, 6-23.
- McPherson, M., Smith-Lovin, L., & Brashears, M.E. (2006). Social isolation in America: changes in core discussion networks over two decades. *American Sociological Review*, 71, 353-375.
- Mesch, G., & Talmud, I. (2006). The quality of online and offline relationships: The role of multiplexity and duration of social relationships. *The Information Society*, 22, 137-148.
- Mitra, A., DuRant, R., Wolfson, M., Martin, B., Champion, H , O'Brien, M.C., Omli, M., & Williams, A. (2004). Benefits and Burdens of Web-based Data Collection among College Students. *Paper presented at the annual meeting of the American Association for Public Opinion Research*, Pointe Hilton Tapatio Cliffs, Phoenix, Arizona.
- Retrieved July 25, 2008 from http://www.allacademic.com/meta/p115878_index.html.

- Moller, L. (1998). Designing communities of learners for asynchronous distance education. *Educational Technology Research and Development*, 46(4), 115-122.
- Moody, E. (2001). Internet use and its relationship to loneliness. *CyberPsychology & Behavior*, 4(3), 393-401. Retrieved May 22, 2008 from <http://pippo.ingentaselect/vl=1281012/cl=19/nw=1/rpsv/catchword/mal/10949313/v4n3/s9/p393>
- Moore, J., Lovell, C., McGann, T., & Wyrick, J. (1998). Why involvement matters: A review of research on student involvement in the collegiate setting. *College Student Affairs Journal*, 17(2), 4-17.
- Morgan, C., & Cotten, S.R. (2003). The relationship between Internet activities and depressive symptoms in a sample of college freshmen. *CyberPsychology and Behavior*, 6(2), 133-142.
- Morahan-Martin, J., & Schumacher, P. (2000). Attitudinal and experiential predictors of technological expertise. *Computers in Human Behavior*, 23(5), 2230-2239.
- Murphy, R. K. (2003). The effects of living-learning program participation on undergraduate educational outcomes at the University of Michigan. Ann Arbor, MI: University of Michigan
- Nachbaur, A. (2003). College students and instant messaging: An analysis of chatting, flirting, and using away messages. *Mercury Project for Instant Messaging Studies*. Retrieved June 28, 2008 from <http://www.stanford.edu/class/pwr3-25/group2/projects/nachbaur.html#>

- Nardi, B.A., Whittaker, S., & Bradner, E. (2000). Interaction and outeraction: Instant messaging in action. In *Proceedings CSCW 2000* (pp. 79-88). Philadelphia, PA: ACM Press.
- Newmann, F.M., Rutter, R.A., & Smith, M.S. (1989). Organizational factors that affect school sense of efficacy, community, and expectations. *Sociology of Education*, 62, 221-238.
- Nicholson, S. (2002). Socialization in the “virtual hallway”: Instant messaging in the asynchronous Web-based distance education classroom. *The Internet and Higher Education*, 5(4), 363-372.
- Nie, N. (2001). Sociability, Interpersonal Relations, and the Internet: Reconciling Conflicting Findings. *American Behavior Scientist*, 45(3), 420-435.
- Nie, N., & Hillygus, D. (2002). The Impact of Internet Use on Sociability: Time-Diary Findings. *IT&Society*, 1(1), 1-20.
- Nisbet, R.A. (1966). *The sociological tradition*. London, UK: Heinemann.
- Nisbet, R. (1969). *Quest for community*. Oxford: Oxford University Press.
- Nisbet, R. & Perrin, R.G. (1977). *The social bond*. New York: Knopf.
- Noel, L., Levitz, R., & Saluri, D. (1991). *Increasing student retention*. San Francisco: Jossey-Bass.
- North Carolina State University (2009). University Planning and Analysis Fast Facts: Enrollment Data Fall 2008. Retrieved January 21, 2009 from <http://www2.acs.ncsu.edu/UPA/fastfacts/quick.htm>
- Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw Hill.
- Oblinger, D., & S. C. Rush (Eds.). (1997). *The learning revolution: The challenge of information technology in the Academy*. Anker Pub Co.

- Oblinger, D.G., Oblinger, J.L. (2005). *Educating the Net Generation*. Boulder, CO: EDUCAUSE, 2(6). Retrieved June 21, 2008 from <http://www.educause.edu/educatingthenetgen>
- Odell, P. M., & Korgen, K. O., Schumacher, P., Delucchi, M. (2000). Internet Use Among Male and Female College Students. *CyberPsychology & Behavior*, 3(5). Retrieved July 12, 2008, from <http://www.liebertonline.com/doi/abs/10.1089/10949310050191836>
- Overbaugh, R.C., & Lin, S (2006). Student Characteristics, Sense of Community, and Cognitive Achievement in Web-Based and Lab-Based Learning Environments. *Journal of Research on Technology in Education*, 39(2), p205-223.
- Palloff, R., & Pratt, K. (1999). *Building learning communities in cyberspace*. San Francisco: Jossey-Bass.
- Pascarella, E., & Terenzini, P. (1991). *How college affects students: Findings and insights from twenty years of research*. San Francisco: Jossey-Bass.
- Peterson, N.A., Speer, P.W., & McMillan, D. (2007). Validation of a brief sense of community scale: Confirmation of the principal theory of sense of community. *Journal of Community Psychology*, 36(1), 61 – 73.
- Phillips, C.D., (2005). A comparison between African-American and white students enrolled in an equal opportunity program on predominantly white college campuses: perceptions of the campus environment. *College Student Journal*, 39(2).
- Pretty, G. (1990). Relating psychological sense of community to social climate characteristics. *Journal of Community Psychology*, 18, 60-65.
- Pretty, G., Andrews, L. & Collett, C. (1994). Exploring adolescents' sense of community and its relationship to loneliness. *Journal of Community Psychology*, 22, 346-358.
- Pretty, G. H., Conroy, C., Dugay, J., Fowler, K., & Williams, D. (1996). Sense of

- community and its relevance to adolescents of all ages. *Journal of Community Psychology*, 24, 365-379.
- Putnam, R. (2000). *Bowling Alone: The Collapse and Revival of the American Community*. New York: Simon & Schuster.
- Rainie, L. (2009). Teens and the Internet. *Pew Internet & American Life Project*. Retrieved February 24, 2009 from <http://www.pewinternet.org/Presentations/2009/Teens-and-the-internet.aspx>
- Rasmussen, G., & Skinner, E. (1997). *Learning communities: Getting started*. Tempe, AZ: Maricopa County Community College District, Maricopa Center for Learning and Instruction, GateWay Community College.
- Rheingold, H. (1991). *The Virtual Community*. New York: Summit.
- Riger, S., & Lavrakas, P. (1981). Community ties patterns of attachment and social interaction in urban neighborhoods. *American Journal of Community Psychology*, 9, 55-66.
- Wilkinson, D. (1995). Sense of community in a remote mining town: Validating a neighborhood cohesion scale. *American Journal of Community Psychology*, 23, 137-148.
- Rohall, D. E., Cotten, S. R., & Morgan, C. (2002). Internet Use and the Self Concept: Linking Specific Uses to Global Self-Esteem. *Current Research in Social Psychology*, 8(1), 1-19.
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic Books.
- Rovai, A.P., & Lucking, R.A. (2000). *Measuring sense of classroom community*. Paper presented to Learning 2000: Reassessing the virtual university, Roanoke, VA.
- Rovai, A.P. (2002). Building Sense of Community at a Distance. *International Review of Research in Open and Distance Learning*. 3(1). Retrieved August 12, 2008 from <http://www.irrodl.org/index.php/irrodl/article/%20viewFile/79/153>

- Rovai, A.P., & Lucking, R.A. (2003). Sense of community in a higher education television-based distance education program. *Educational Technology Research and Development*, 52(2), 5-16.
- Royal, M.A., & Rossi, R.J. (1996). Individual-level correlates of sense of community: Findings from workplace and school. *Journal of Community Psychology*, 24(4), 395-416.
- Sandeen, A. (1989). A Chief Student Affairs officers Perspective on the AISP Model. *New Directions for Student Services*, 45. San Francisco: Jossey-Bass.
- Sarason, S.B. (1974). *The psychological sense of community: Prospects for a community psychology*. San Francisco: Jossey-Bass.
- Schlossberg, N. (1989). Marginality and mattering: Key issues in building community. In Mj.J. Barr & M.L. Upcraft (Eds.), *Designing campus activities to foster a sense of community*. (New Direction for Student Services, no. 48.) San Francisco: Jossey-Bass.
- Schuler, D. (1996). *New Community Networks*. New York, New York: Addison-Wesley Publishing Company.
- Schieman, S., & Taylor, J. (2001). Statuses, Roles, and the Sense of Mattering. *Sociological Perspectives*. 44(4), 469–484. Retrieved November 22, 2008 from <http://caliber.ucpress.net/doi/abs/10.1525/sop.2001.44.4.469>.
- Severs, A. (2007). Using Technology to Encourage Student Engagement through Co-curricular Programs. *Article for CollegiateLink - Technology in Student Affairs Newsletter*. Retrieved December 12, 2008 from

- http://collegiatelink.net/option,com_myblog/show,Using-Technology-to-Encourage-Student-Engagement-through-Co-curricular-Programs.html/Itemid,122/
- Shaw, L.H., & Gant, L.M. (2002). In defense of the Internet: The relationship between Internet communication and depression, loneliness, self-esteem, and perceived social support. *Cyberpsychology and Behavior*, 5(2), 157-171.
- Shier, M.T. (2005). The Way Technology Changes How We Do What We Do. *New Directions for Student Services*, 112, 77-87.
- Shiu, E., & Lenhart, A. (2004). How Americans Use Instant Messaging. *Washington, D.C.: Pew Internet & American Life Project*. Retrieved May 22, 2008 from:
http://www.pewinternet.org/pdfs/PIP_Instantmessage_Report.pdf.
- Spitzberg, Jr. I., & Thorndike, V.V. (1992). *Creating a community on college campuses*. Albany, New York: State University of New York Press.
- Squires, L. M. (2003). College students in multimedia relationships: choosing, using, and fusing communication technologies. American University. Senior Capstone Project. Retrieved July 5, 2008 from
<http://www.ecommons.net/aoir/aoir2003/index.php?t=259>
- Taub, D. J. (1998). Building community on campus: Student affairs professional as group workers. *Journal for Specialists in Group Work*, 23, 411-427.
- Taylor, J., & Turner, R.J. (2001). A Longitudinal Study of the Role and Significance of Mattering for Depressive Symptoms. *Journal of Health and Social Behavior*, 42, 309-324.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition research*

- (2nd ed.). Chicago: University of Chicago.
- Tönnies, F. (1957). *Community and Society*. Loomis, C.P., trans. New York: Harper & Row.
- Treuer, P., & Belote, L. (1997). Current and emerging applications of technology to promote student involvement and learning. In Engstrom, C. M. & Kruger, K. W. Using technology to promote student learning. *New Directions for Student Services*, 78, 17–30.
- Tu, C., & Corry, M. (2002). E-Learning Communities. *Quarterly Review of Distance Education*, 3(2), 207.
- Tyler, T. R. (2002). Is the Internet changing social life? It seems the more things change, the more they stay the same. *Journal of Social Issues*, 58(1), 195-205.
- U.S. Department of Commerce (2004). *A Nation Online: Entering the Broadband Age*. Retrieved February 20, 2009 from <http://www.ntia.doc.gov/reports/anol2004/NationOnlineBroadband04.htm>
- Valkenburg, P.M., & Peters, J. (2007a). Preadolescents' and adolescents' online communication and their closeness to friends. *Developmental Psychology*, 43(2), 267-277.
- Valkenburg, P.M., & Peters, J. (2007b). Internet Communication and Its Relation to Well-Being: Identifying Some Underlying Mechanisms. *Media Psychology*, 9(1), 43 – 58.
- Wandersman, A., & Giamartino, G. (1980). Community and individual difference characteristics as influences on initial participation. *American Journal of Community Psychology*, 8, 217-228.

- Wellman, B., & Gulia, M. (1999). 'Net-Surfers Don't Ride Alone: Virtual Communities as Communities'. In Barry Wellman. (Ed.), *Networks in the global village: Life in contemporary communities*. Boulder, CA: Westview.
- Wighting, M.J. (2006). Effects of computer use on high school students' sense of community. *The Journal of Educational Research*. 99(6), 371-379.
- Wiley, L. (2002). Review of W.M. McDonald and Associates (Eds.), *Creating campus community: In search of Ernest Boyer's legacy*. *Teachers College Record*, 105(4).
- Wright, S.P. (2004). Exploring Psychological Sense of Community in Living-Learning Programs and in the University as a Whole. Dissertation. University of Maryland.
- Zanutto, E. (2001). Web & E-mail Surveys. Retrieved May 10, 2008 from:
<http://www.stat.wharton.upenn.edu/~zanutto/Annenberg2001/docs/websurveys01.pdf>

APPENDIX

APPENDIX A: Survey Instrument

Thank you for taking the time to complete this survey. This website contains survey completion directions, survey questions as well as contact and resource information. If you have any questions at any point, please contact Amanda Thomas at amanda_thomas@ncsu.edu.

For the purposes of this study, instant messaging, also known as IM, will refer to the exchange of messages through programs such as AOL's AIM, Windows Live Messenger, Yahoo! Messenger, Facebook Chat, MySpace Chat, GoogleTalk, Apple's iChat, and Trillian.

Instructions: To answer a question, click on the bubble for the response you are choosing. After you have answered all the questions, you must hit the SUBMIT button at the end of the survey to submit your responses.

APPENDIX A, Continued

Please answer the following questions regarding <i>NC STATE UNIVERSITY.</i>	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I really feel like I belong here.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. There is a sociable atmosphere on campus.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I wish I had gone to another university instead of this one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Students feel they can get help if they are in trouble.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would recommend this university to students in my high school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. My parents like this university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. There is a strong feeling of togetherness on campus.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I someday plan to give alumni contributions to this university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I really enjoy going to school here.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Students here really care about what happens to this university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I feel very attached to this university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Campus life is very stimulating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. If I am/were going to college next year, I would go here.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. There is a real sense of community here.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX A, Continued

Please answer the following questions regarding NC STATE UNIVERSITY.	A Lot	Somewhat	A Little	Not At All
15. How important do you feel you are to other people on campus?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. How much do you feel other people on campus pay attention to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. How much do you feel others on campus would miss you if you went away?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. How interested are people on campus generally in what you have to say?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. How much do other people on campus depend on you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Please select each activity that currently applies to you: Activities refer to those at NC State unless otherwise specified.				
	<input type="checkbox"/> Work full-time off campus			
	<input type="checkbox"/> Work full-time on campus			
	<input type="checkbox"/> Work part-time off campus			
	<input type="checkbox"/> Work part-time on campus			
	<input type="checkbox"/> Member of student government			
	<input type="checkbox"/> Member of instrumental ensembles			
	<input type="checkbox"/> Member of theater, thespian, acting club			
	<input type="checkbox"/> Member of choral ensembles			
	<input type="checkbox"/> Member of scholastic/academic honor society			
	<input type="checkbox"/> Member of a fraternity or sorority			
	<input type="checkbox"/> Member of residence hall staff			
	<input type="checkbox"/> Member of student media			
	<input type="checkbox"/> Participate in intramural or club sports			
	<input type="checkbox"/> Participate in varsity sports			
	<input type="checkbox"/> Participate in ROTC/ military organization			
	<input type="checkbox"/> Participate in campus religious organization			
	<input type="checkbox"/> Participate in campus environmental organization			
<input type="checkbox"/> Participate in campus cultural organization				
<input type="checkbox"/> Participate in campus ethnic organization				
<input type="checkbox"/> Participate in campus hobby group/club				
<input type="checkbox"/> Participate in campus political organization				
<input type="checkbox"/> Participate in other campus social organization				

APPENDIX A, Continued

Please select the best answer regarding your use of instant messaging.

For the purposes of this study, instant messaging, also known as IM, will refer to the exchange of messages through programs such as AOL's AIM, Windows Live Messenger, Yahoo! Messenger, facebook.com Chat, MySpace Chat, Google Talk, Trillian, Pidgin, and Apple's iChat.

21. Do you use instant messaging?	<input type="radio"/> Yes <input type="radio"/> No (If no, please go to the end and select SUBMIT.)
22. If so, generally speaking, how often do you log into instant message?	<input type="radio"/> Several times a day <input type="radio"/> About once a day <input type="radio"/> 3-5 days a week <input type="radio"/> 1-2 days a week <input type="radio"/> Every few weeks <input type="radio"/> Less often <input type="radio"/> Don't know
23. On a typical day, how much time do you spend actively sending and receiving instant messages?	<input type="radio"/> 4 hours or more <input type="radio"/> 3 hours or more but less than 4 hours <input type="radio"/> 2 hours or more but less than 3 hours <input type="radio"/> More than 1 hour but less than 2 hours <input type="radio"/> About an hour <input type="radio"/> Half hour or more but less than 1 hour <input type="radio"/> 5 minutes to less than a half-hour <input type="radio"/> Less than 15 minutes <input type="radio"/> Don't know
24. How many people do you instant message with on a regular basis? Just your best guess is fine.	<input type="radio"/> More than 10 <input type="radio"/> 6-10 <input type="radio"/> 3-5 <input type="radio"/> 1-2 <input type="radio"/> None <input type="radio"/> Don't know
25. I use instant messaging to communicate with: (Select all that apply.)	<input type="checkbox"/> Family <input type="checkbox"/> Friends at NC State <input type="checkbox"/> Friends NOT at NC State <input type="checkbox"/> Professors/instructors at NC State <input type="checkbox"/> Classmates at NC State to discuss coursework <input type="checkbox"/> Offices/staff/administration at NC State <input type="checkbox"/> Other

Submit

APPENDIX B: IRB Submission and Approval

North Carolina State University
 Institutional Review Board for the Use of Human Subjects in Research
 REQUEST FOR EXEMPTION (Administrative Review)

GENERAL INFORMATION

1. Date Submitted: _____
2. Title of Project: <u>The Relationship Between Students' Use of Instant Messaging and Their Psychological Sense of Community</u>
3. Principal Investigator: <u>Amanda G. Thomas</u>
4. Department: <u>Distance Education and Technology Services</u>
5. Campus Box Number: <u>7301</u>
6. Email: <u>amanda_thomas@ncsu.edu</u>
7. Phone: <u>919-602-8479</u>
8. Fax Number: _____
9. Faculty Sponsor Name and Email Address if Student Submission: <u>Joy Gayles, Ph.D.</u>
10. Source of Funding? (required information): _____
11. Is this research receiving federal funding?: <u>No</u>
12. If Externally funded, include sponsor name and university account number: _____
13. RANK: <input type="checkbox"/> Faculty <input checked="" type="checkbox"/> Student: <input type="checkbox"/> Undergraduate; <input type="checkbox"/> Masters; or <input checked="" type="checkbox"/> PhD <input type="checkbox"/> Other (specify): _____

As the principal investigator, my signature testifies that I have read and understood the University Policy and Procedures for the Use of Human Subjects in Research. I assure the Committee that all procedures performed under this project will be conducted exactly as outlined in the Proposal Narrative and that any modification to this protocol will be submitted to the Committee in the form of an amendment for its approval prior to implementation.

Principal Investigator:

Amanda G. Thomas _____ * _____
 (typed/printed name) (signature) (date)

As the faculty sponsor, my signature testifies that I have reviewed this application thoroughly and will oversee the research in its entirety. I hereby acknowledge my role as the principal investigator of record.

Faculty Sponsor:

Joy Gayles, Ph.D. _____ * _____
 (typed/printed name) (signature) (date)

*Electronic submissions to the IRB are considered signed via an electronic signature

PLEASE COMPLETE AND DELIVER TO:

..... joe_rablega@ncsu.edu or Institutional Review Board, Box 7514, NCSU Campus (Administrative Services III, Room 245)

For SPARCS office use only

Regulatory Compliance Office Disposition

Exemption Granted Not Exempt, Submit a full protocol

Exempt Under: b.1 b.2 b.3 b.4 b.6

 IRB Office Representative

 Date

APPENDIX B, Continued

Project Description: (Describe your project by providing a brief summary and answering the requests for information below).

1. Project Summary. Please make sure to describe all study activities:

This is a doctoral study to assess NC State students' perceived campus environment with regards to computer use, specifically Instant Messaging.

2. Description of participant population, including age range, inclusion/exclusion criteria, and any vulnerable populations that will be targeted for enrollment.

The population for this study will be all NC State undergraduate students enrolled in degree programs in the Fall 2008, excluding all distance education, associate degree seeking and lifelong education students

3. Description of how potential participants will be approached about the research, and how informed consent will be obtained. Alternatively, provide an explanation of why informed consent will not be obtained.

Students will be sent an emailed invitation to participate (attached) and will be notified that participation is completely voluntary.

4. Description of how identifying information will be recorded and associated with data (e.g. code numbers used that are linked via a master list to subjects' names). Alternatively, provide details on how study data will be collected and stored anonymously ("anonymously" means that there is no link whatsoever between participant identities and data).

Students will use their unity IDs to log into the online survey, which will then be matched with the data already on file with University Planning and Analysis (UPA). Gender (male/female), classification (freshman, sophomore, junior, senior), and residential status (on-campus/off-campus) will all be collected from UPA's dataset

5. Description of all study procedures, including topics that will be discussed in interviews and/or survey instruments.

This research will utilize an online survey that will be distributed to a sample of 3000 undergraduate students. It will ask them their perceived sense of community and their Instant Messaging use. Instrument is attached.

6. Will minors (participants under the age of 18) be recruited for this study:

No

7. Is this study funded? No If yes, please provide the grant proposal or any other supporting documents.
8. Is this study receiving federal funding? No
9. Do you have a significant financial interest or other conflict of interest in the sponsor of this project? No
10. Does your current conflicts of interest management plan include this relationship and is it being properly followed? No
11. HUMAN SUBJECT ETHICS TRAINING

*Please consider taking the [Collaborative Institutional Training Initiative](#) (CITI), a free, comprehensive ethics training program for researchers conducting research with human subjects. Just click on the underlined link.

*If a survey instrument or other documents such as a consent form that will be used in the study are available, attach them to this request. If informed consent is not necessary, an information or fact sheet should be considered in order to provide subjects with information about the study. The informed consent form template on the IRB website could be modified into an information or fact sheet.

APPENDIX B, Continued

The Following are categories the IRB office uses to determine if your project qualifies for exemption (a review of the categories below may provide guidance about what sort of information is necessary for the IRB office to verify that your research is exempt):

Exemption Category: (Choose only one of the following that specifically matches the characteristics of your study that make this project exempt)

- 1. Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
- 2. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.
***Please Note- this exemption for research involving survey or interview procedures or observations of public behavior does not apply to research conducted with minors, except for research that involves observation of public behavior when the investigator(s) do not participate in the activities being observed.**
- 3. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
- 4. Research, involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.
- X 5. Not applicable
- 6. Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration, or approved by the Environmental Protection Agency, or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

APPENDIX B, Continued

North Carolina State University is a land-grant university and a constituent institution of The University of North Carolina

**Office of Research
and Graduate Studies**

NC STATE UNIVERSITY

Sponsored Programs and
Regulatory Compliance
Campus Box 7514
2701 Sullivan Drive
Raleigh, NC 27695-7514

919.515.7200
919.515.7721 (fax)

From: Joseph Rabiega, IRB Coordinator
North Carolina State University
Institutional Review Board

Date: November 4, 2008

Project Title: The Relationship Between Students' Instant Messaging Use and Their Psychological Sense of Community

IRB#: 423-08-11

Dear Amanda:

The research proposal named above has received administrative review and has been approved as exempt from the policy as outlined in the Code of Federal Regulations (Exemption: 46.101.b.2). Provided that the only participation of the subjects is as described in the proposal narrative, this project is exempt from further review.

NOTE:

1. This committee complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU projects, the Assurance Number is: FWA00003429.
2. Any changes to the research must be submitted and approved by the IRB prior to implementation.
3. If any unanticipated problems occur, they must be reported to the IRB office within 5 business days.

Please provide a copy of this letter to your faculty sponsor.

Sincerely,

Joseph Rabiega
NCSU IRB

APPENDIX C: Permissions to Use Survey Instruments

Collegiate Psychological Sense of Community

From: <JLounsbury@aol.com> Thursday - September 11, 2008 2:18 PM
To: <agthomas@gw.fis.ncsu.edu>
Subject: Re: Permission to use Collegiate Psychological Sense of Community Scale

Hi Amanda,
Sounds like an interesting project. Here are two versions of my collegiate PSC scale. I give you permission to use whichever one you wish. Just be sure to cite me in any write-up.

I would be interested in seeing a copy of your study when completed.

Regards,
John
John W. Lounsbury
Professor
Dept. of Psychology
University of Tennessee
Knoxville, TN 37996-0900

Pew Internet and American Life Project: IM Use

From: "Amanda Lenhart" <alenhart@pewinternet.org> Wednesday - September 17, 2008 4:04 PM
To: "Amanda Thomas" <agthomas@gw.fis.ncsu.edu>
Subject: RE: Permission to use questions from survey instrument
Attachments: Mime.822 (3103 bytes) [View] [Save As]

Nope this is sufficient. We make the instruments available so that others can use them. Of course we do hope that people cite us, as you indicate you will do.

Best of luck with your research and dissertation!

-Amanda

APPENDIX D: Invitation to Participate in Survey

Dear NC State Student:

I am a doctoral student in the Department of Adult and Higher Education. I would like to ask you to complete an online survey designed to measure students' instant messaging use and how students perceive their environment at NC State.

You have been randomly selected from a list of all undergraduate students at NC State to participate in this research. **Your participation is completely voluntary.**

To complete the survey online, please go to the URL below (click on "Survey" below). You will need to enter your Unity ID to take the survey. Your ID will be only be used for tracking purposes and your identifying information will not be directly linked back to your responses. Your answers will be completely confidential.

Upon receipt of your completed questionnaire, you will be entered in a drawing for \$50 gift certificates from the NC State Bookstore. Four (4) certificates will be awarded. The randomly selected winners will be selected from the total of completed surveys and will be announced on November 24, 2008.

Thank you in advance for your participation in this important project. If you have any questions about the administration of the survey or would like a paper version of the survey, please contact Amanda Thomas, Graduate Student, Higher Education Administration at amanda_thomas@ncsu.edu or 919-602-8479.

Sincerely,

Amanda G. Thomas
Doctoral Student
Higher Education Administration

Joy Gaston Gayles, Ph.D.
Committee Chair

APPENDIX E: Follow Up Email to Participate in Survey

Dear NC State Student:

I recently emailed you a “Survey on the Environment at NC State University.” If you have not completed the survey, I ask that you do so now. Your participation is crucial to the success of my research. The link to the survey is below.

As a reminder, once you complete the survey you will be entered in a drawing for four (4) \$50 NC State Bookstore gift certificates.

If you have any questions or would like a paper copy, please contact me at amanda_thomas@ncsu.edu or 919-602-8479.

Thank you again,
Amanda G. Thomas
Doctoral Student
Higher Education Administration

Joy Gaston Gayles, Ph.D.
Committee Chair

APPENDIX F: Coding of Variables

Table 7

Coding of Variables

Variable	Coding
AGE	
18-27	1, 0 Reference group
28 and older	1, 0
GENDER	
Male	1, 0 Reference group
Female	1, 0
RACE/ETHNICITY	
White	1, 0 Reference group
Minority	1, 0
CLASSIFICATION	
Freshman	1, 0 Reference group
Sophomore	1, 0
Junior	1, 0
Senior	1, 0
COLLEGE	
Engineering	1, 0 Reference group
Math and sciences	1, 0
Humanities	1, 0
Other	1, 0
RESIDENTIAL STATUS	
On campus	1, 0 Reference group
Off campus	1, 0
PERMANENT RESIDENCE	
In state	1, 0 Reference group
Out of state	1, 0
ACTIVITIES	
Work part-time off campus	1, 0
Work part-time on campus	1, 0
Member of a fraternity or sorority	1, 0
Participate in intramural or club sports	1, 0
Participate in campus religious organization	1, 0
Participate in other social organization	1, 0
SENSE OF MATTERING	Continuous

APPENDIX F, Continued

Table 7 Continued

Variable	Coding
IM USE	1, 0
FREQUENCY	Continuous
DURATION	Continuous
NUMBER OF PEOPLE	Continuous
TYPE OF PEOPLE	1, 0
Family	1, 0
Friends at NC State	1, 0
Friends NOT at NC State	1, 0
Classmates at NC State to discuss coursework	1, 0
Other	1, 0
SENSE OF COMMUNITY	Continuous

APPENDIX G: Respondent Profile

Table 1

Distribution of Respondent Demographics

Variable	Sample	Population*
Age		
18-27	95.9%	95.3%
28-39	3.1%	2.0%
40-49	1.0%	0.3%
50 and older	0%	0.1%
Gender		
Male	44.7%	55.4%
Female	55.3%	44.6%
Race		
White	81.0%	79.4%
African American	8.2%	9.1%
Asian/Pacific Islander	4.9%	0.5%
Hispanic	2.4%	5.6%
American Indian/Alaskan	0.3%	2.7%
Undeclared	3.1%	2.7%
Classification		
Freshmen	26.1%	27.4%
Sophomore	22.7%	23.6%
Junior	23.3%	23.6%
Senior	27.9%	25.4%
College		
Engineering	24.1%	25.9%
Agriculture Life Sciences	22.0%	19.4%
Humanities	20.6%	17.2%
Physical/Math Sciences	3.7%	3.9%
Textiles	4.1%	4.0%
Design	2.1%	2.2%
Education	4.2%	3.7%
Management	10.9%	11.4%
Natural Resources	4.9%	5.0%
First Year College	3.4%	7.2%

APPENDIX G, Continued

Table 1 Continued

Variable	Sample	Population*
Residential Status		
On campus	41.2%	52.5%
Off campus	58.8%	47.5%
Permanent Residence		
In state	93.2%	92.1%
Out of state (incl. Int'l)	6.5%	7.9%
Activities		
Work full time off campus	5.0%	
Work full-time on campus	.8%	
Work part-time off campus	30.0%	
Work part-time on campus	18.2%	
Fraternity/Sorority	12.1%	
Club sports	28.1%	
Religious organization	18.2%	
Other social organization	20.5%	

Note. * SOURCE: North Carolina State University – University Planning and Analysis (2009).

APPENDIX H: Distribution of IM Use Variables

Table 2

Distribution of IM Use (N=662)

Variable	Frequencies	Percent
18-27	534	80.7
28 and older	184	27.8
Male	293	44.3
Female	369	55.7
White	549	82.9
Minority	96	14.5
Freshmen	160	24.2
Sophomores	144	21.8
Juniors	157	23.7
Seniors	201	30.4
Engineering	152	23.0
Math and sciences	140	21.1
Humanities	199	30.1
Other college	171	25.8
On campus	260	39.3
Off campus	402	60.7
In state	618	93.5
Out of state	43	6.5
Work part-time off campus	197	29.8
Work part-time on campus	126	19.0
Fraternity/sorority	80	12.1
Intramural/club sports	192	29.0
Religious organization	126	19.0
Other social organization	145	21.9

APPENDIX H, Continued

Table 3

Distribution of Frequency of IM Use (N=662)

Variable	Frequencies	Percent
Less often	43	4.9
Every few weeks	76	8.7
1-2 days a week	89	10.2
3-5 days of week	73	8.4
About once a day	143	16.4
Several times a day	259	29.7
Don't know	7	.8

Table 4

Distribution of Duration of IM Use (N=662)

Variable	Frequencies	Percent
Less than 5 minutes	165	18.9
5 minutes to less than a half-hour	102	11.7
Half-hour or more but less than 1 hour	107	12.3
About an hour	90	10.3
More than 1 hour but less than 2 hours	76	8.7
2 hours or more but less than 3 hours	56	6.4
3 hours or more but less than 4 hours	22	2.5
4 hours or more	42	4.8
Don't know	26	3.0

APPENDIX H, Continued

Table 5

Distribution of IM Use Number of People (N=662)

Variable	Frequencies	Percent
None	25	2.9
1-2	209	23.9
3-5	317	36.3
6-10	86	9.9
More than 10	35	4.0
Don't know	10	1.1

Table 6

Distribution of IM Use Type of People (N=662)

Variable	Frequencies	Percent
Family	381	43.6
Friends at NC State	565	64.7
Friends not at NC State	613	90.0
Classmates	338	38.7
Other	138	16.6

APPENDIX I: Correlation Matrix

Table 8

Correlation Matrix of Variables

	age	gend	race	coll	clas	res	padd	poff	pon	frat	club	reli	soc	matt	imus	freq	dur	num	
age	1.000																		
gend	-.039	1.000																	
race	.288	-.100	1.000																
coll	.363	-.290	.346	1.000															
clas	.025	.047	.102	.248	1.000														
res	.069	.648	.152	-.299	.166	1.000													
padd	.487	.484	.060	.626	.022	.394	1.000												
poff	.584	.265	.147	.411	.131	-.184	.133	1.000											
pon	-.241	-.363	.301	.516	-.266	.026*	-.164	.363	1.000										
frat	-.254*	.152	-.204	.345	.046	.187	.444	.025	.099	1.000									
club	-.144	.358	-.154	.277	.233	.165	.212	.167	.194	.064	1.000								
reli	-.599	.233	.549*	.344	.162	.465	.619	.304	-.044	.088	.056	1.000							
othr	.008	.167	.167	.194	.310	.028	.045	.741	.130	.264	-.899	.164	1.000						
matt	.012	.157*	.304	-.044	.111	.015	.497	.316	.069**	.648	.152	.069	.587***	1.000					
imus	.064	-.022	.273*	.029	.363**	-.290	.346	.544	.487	.484	.060	.487	.146	.111	1.000				
freq	.088	.056	-.668	-.033	.025	.047	.102	.029	.584	.265	.147	.584	.046	.187	.046	1.000			
dura	.264	-.899	.017	.048	-.163	.165	-.499	.077	-.241**	-.363	.301	-.241	.233	.165	.233	.160	1.000		
num	.105	.416	.069	.161	.199	.587	.034	.344	.584	.265	.411	.131	-.14	.363	-.290	.346	.411	1.000	

Note: * $p < .05$ ** $p < .01$ *** $p = .000$

APPENDIX I: Correlation Matrix, Continued

Gend = gender; coll = college; clas = classification; res = residential status; padd = permanent address; poff = work part-time off campus; pon = work part-time on campus; frat = fraternity/sorority; club = intramural/club sports; reli = religious organization; soc = sense of community; matt = sense of mattering; imus = IM user; freq = frequency of IM use; dur = duration of IM use; num = number of people; tfam = type of people family; tfr = type of people friends at NC State; tnt = type of people friends not at NC State; tclas = type of people classmates; toth = type of people other.