12-2011

Exploring the Role of Email, Blackboard, and Facebook in Student-Instructor Interactions Outside of Class: A Mixed Methods Study

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I am submitting herewith a dissertation written by Olivia Laura Halic entitled "Exploring the Role of Email, Blackboard, and Facebook in Student-Instructor Interactions Outside of Class: A Mixed Methods Study." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Educational Psychology and Research.

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Exploring the Role of Email, Blackboard, and Facebook in Student-Instructor Interactions Outside of Class: A Mixed Methods Study

A Dissertation Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Olivia Laura Halic

December 2011

DEDICATION

To my dear parents, *Laura* and *Ioan*,
for their endless love

&

To my dear husband, *Ovidiu*,
for inspiring me to dream

ACKNOWLEDGEMENTS

My gratitude goes to my dissertation committee for mentorship and support with this project and throughout my doctoral journey. **Dr. Katherine Greenberg**, thank you for being my mentor throughout this process. You are one of the most caring professor and person I ever met. From the first day in the doctoral program, I have never ceased to be amazed by your modesty, openness, and caring for your students. I recognize your admirable talent of seeing potential in each student and investing the right amount of care and guidance to help each one succeed. Your love for learning, openness to diversity, and constant re-invention are truly admirable. **Dr. Sky Huck**, I am grateful for your incessant kindness and disarming modesty. You have given me the love for statistics that will follow me throughout my life. Thanks to you, I know that each day is a "great day for statistics." Thank you for being the professor who makes things seem effortless and helps students believe in themselves. **Dr. Trena Paulus**, thank you for always challenging me to reach higher and further. You have been an inspiration, a model of dedication, intelligence, perseverance, and work ethic. Thank you for constantly modeling for your students what it means to be a successful professor and researcher. **Dr. Ralph Brockett**, I am grateful for your amazing support during this process and for your valuable feedback on my dissertation. I value your kindness, generosity, and enthusiasm for learning.

I gratefully acknowledge the contribution of the participants in this study, students and professors, without whom this project would have not been possible. In addition, special thanks go to the instructors who kindly helped with the survey administration: Brittany Aronson, Evren Atiker, Deborah Buchanan, Irina Cozma, Karen Franklin, Bob Hutton, Sally Parish, Liz Price, and Kelly Rivers. I am also grateful to Evren Atiker, Dr. Neil Greenberg, Karen Franklin, and Dr. Trena Paulus for facilitating my access to interview participants.

I express my appreciation to Dr. Steve McCallum, the chair of the Department of Educational Psychology and Counseling, for the support provided throughout my doctoral studies. Working with him as a graduate assistant during my first year has been a great learning experience. My appreciation also goes to April Phillips, Beverly Cate, and Marie Fox in the department's main office for all their assistance and advice.

I acknowledge my colleagues at the Office of Institutional Research and Assessment who kindly accepted me into their "family." This office provided me with the graduate assistantship much needed to complete my studies and with an environment conductive to learning and development. Special thanks to Donald Cunningham for his support and collegiality.

Irina Cozma, thank you for being a supportive, inquisitive, and honest friend. I value your honesty and caring.

Thank you to my mother, Laura Halic, and to my father, Ioan Halic, for always being "with me" (although 4,000 miles away), from day one. Your love and encouragements are my strength.

Thank you, my dear Ovi, for inspiring me to dream of a different tomorrow. We have been in this journey together and we made it. I love you.

ABSTRACT

This dissertation was a mixed methods triangulation design combining quantitative and qualitative components. The purpose of this study was twofold. First, it examined the association between the frequency and quality of students' online interactions with instructors and the quality of student-instructor relationship. Second, this study explored the meanings of student-instructor interactions mediated by online tools. Quantitative data were collected via an online survey from 320 undergraduate students enrolled at a public research university. Qualitative data sources were in-depth interviews with six undergraduate students and six professors, observations of student-instructor interactions on Facebook, and artifacts of student-instructor interaction via email. Hierarchical regression analysis showed that approximately one third of the variance in student-instructor connectedness was explained by the frequency of and satisfaction with face-to-face, email, Blackboard, and Facebook; the grade obtained in the class; and demographic variables. Significant predictors of connectedness were grade, frequency of face-to-face student interest-driven communication, satisfaction with the face-to-face interactions, and satisfaction with the email communication. The qualitative findings revealed that instructors held expectations of formal communication for email interactions, while students had expectations for response from instructors within one-two business days. The email practices identified for instructors included responding to student email within two days; compensating for limited face-to-face time; engaging students in communication about the class content; and dealing with student disengagement. Students adopted two main practices related to email: avoiding "emergency" emails to contact instructors, and using email to avoid face-to-face contact in some situations. For Facebook interactions, instructors expected that students initiate connections,

while students expected that instructors signal their availability for connection with students. Instructors' Facebook practices pointed out different approaches for accepting student friend requests; and performing interactions. Students' practices on Facebook highlighted two patterns: initiating connections with instructors during the semester versus at the beginning of the semester. In addition, preserving connections beyond the boundaries of a class was a practice common to students and instructors.

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CHAPTER 1: INTRODUCTION

Student success and persistence in college depends on integration and active membership in the academic and social communities of the college (Tinto, 1993). In line with Tinto's view of colleges as systems of intertwined academic and social communities, the Boyer Commission on Educating Undergraduates in the Research University (1996) emphasized the need for universities to foster a sense of community on campus by engaging students in learning communities in which "every student feels special connections" (p. 34) with peers and faculty members. Moreover, supportive relationships between undergraduate students and faculty members that function similar to mentor-mentee relationships were considered essential in building such learning communities.

The view of colleges as learning communities are supported by the sociocultural theories of learning (Vygotsky, 1978, Lave & Wenger, 1991, Wenger, 1998) that argue that learning occurs in interaction with others by forming "evolving bonds between the individual and the others" (Sfard, 1998, p. 6). From a situated perspective (Lave & Wenger, 1991, Wenger, 1998), learning in formal and informal contexts is viewed as active participation in practice. To be a learner is to become a legitimate peripheral participant, to become "gradually enculturated into participation" in various communities of practice (Bransford et al., 2006). From this perspective, learning is not a process of assimilation of knowledge that can be achieved by the learner in isolation, but one that engages the whole person into becoming a member of a certain community through interactions with others (Sfard, 1998). In these interactions, both the learner and the community evolve as norms, meanings, and roles are constantly negotiated (Sfard, 1998; Wenger, 1998). By developing a network of relationships and negotiating membership, the learner gains access to the learning resources of the community (Lave & Wenger, 1991).

Supporting the sociocultural views of learning, research in higher education shows that classroom environments that emphasize supportive student-instructor relationships contribute to students' academic achievement and persistence (Lichtenstein, 2005; Umbach & Wawrzynski, 2005). Moreover, research on student-instructor relationships that develop through informal out-of-class interactions highlights similar positive associations. Informal interactions with instructors are linked to a wide range of student outcomes such as intellectual and personal development; aspirations for higher academic degrees; academic achievement; and first-year persistence (Pascarella, 1980; Cotten & Willson, 2006; Cress 2008; Cox, McIntosh, Terenzini, Reason & Quaye, 2010).

Universities in the United States invest considerable effort to foster out-of-class interactions between students and instructors through initiatives such as residential learning communities (Pascarella & Terenzini, 1981; Cox & Orehovec, 2007), undergraduate research programs (Nagda, Gregerman, Jonides, von Hippel & Lerner, 1998), and faculty-student mentoring partnerships (Cotten & Willson, 2006; Cox & Orehovec, 2007). Essential about students-instructor interactions that extend outside of the classroom is that, besides serving concrete purposes (e.g., clarifications about assignments, recommendations for career options, and advice for course selection), these interactions constitute informal learning events about the practices and norms of the academic and social communities of the college. Due to their role in legitimizing students' participation in these communities and facilitating access to learning resources (Lave & Wegner, 1991), these interactions are important outcomes in themselves.

However, despite institutional investments and beneficial consequences for students, empirical studies continue to report a puzzling phenomenon at a majority of institutions: students and faculty members rarely interact beyond the classroom setting (Pascarella, 1980; Fusani,

1994; Anaya & Cole, 2001; Kuh & Hu, 2001; Chang, 2005; Cotten & Willson, 2006; Cox & Orehovec, 2007; Cox et al., 2010).

STATEMENT OF THE PROBLEM

Although the findings of rare interactions between students and instructors are surprising, the way in which the literature conceptualizes informal student-instructor interactions seems to overlook that a fair amount of interaction occurs online, mediated by the Internet. While previous research focused on face-to-face interactions, it ignored the role of technology in mediating student-instructor interactions at residential colleges. This neglect is certainly justified for the pre-Internet era, when communication and interaction between students and instructors occurred exclusively face-to-face or by telephone. However, with the advent of the Internet and its early adoption in many universities in the U.S., student-instructor interactions are not limited anymore to face-to-face interactions. On the contrary, computer-mediated communication (CMC) between instructors and students has become mainstream in most American universities (Jones, Jonhson-Yale, Millermaier, & Perez, 2008; Jones & Johnson-Yale, 2005). A nationwide survey conducted in 2004 reported that nearly all participating instructors (98%) communicate in one form or another with their students via the Internet (Jones & Jonhson-Yale, 2005). Email was the preferred medium, with an impressive 92% of instructors reporting email communication with students. Web-based course management systems and chat were Internet applications also used for student-instructor exchanges, with less popularity however (55% and 37% respectively). Supplementary information about students' perceptions and practices, collected in 2005 (Jones, Johnson-Yale, Millermaier & Perez, 2008), showed that 84% of students used the Internet to communicate with instructors and approximately 80% of students communicated via email with instructors. About half of students reported "more communication with professors face-to-face

than [via] email" (p.171), which implies that in-person interaction is no longer the only strategy for relationship maintenance between students and instructors. In general, students revealed positive attitudes towards computer-mediated communication with instructors, with almost half of surveyed students feeling that CMC enhanced their relationships with instructors.

Despite technology's prevalence in academia and its capability to supplement face-to-face student-instructor communication, research that investigates computer-mediated communication outside of the classroom between students and instructors is quite limited. Surprisingly, very few studies on informal interactions conducted since the 1990s have included computer-mediated communication (e.g., email, Blackboard, instant messaging, and social networking sites). As an exception, the National Survey of Student Engagement (NSSE) recently started to include an item related to the frequency of student interactions with faculty members via email (Laird & Kuh, 2005), but no attention has been directed toward other CMC tools. At the same time, several scholars emphasized the need to explore how technologies such as email foster informal interactions between students and instructors (Laird & Cruce, 2009; Cox & Orehovec, 2007; Laird & Kuh, 2005). In the same direction, this study sought to fill this gap by exploring the role of computer-mediated communication in student-instructor informal interactions.

This study focused on several technologies that have the potential to facilitate interactions between college students and their instructors: email, communication features within course management systems (i.e., Blackboard), social network sites (i.e., Facebook), and instant messaging (IM). Facebook, a social network site that has gained considerable popularity among college students, (Ellison, Steinfiled, & Lampe, 2007; Raacke, & Bonds-Raacke, 2008; Lewis, Kaufman, & Christakis, 2008) has been of particular interest for this study due to its potential to

facilitate informal interactions between students and instructors. In addition, this study explored student-instructor interactions via email, course management systems (i.e., Blackboard) and instant messaging, which were reported as online tools most frequently used by college instructors in the Unites States to communicate online with their students (Jones & Johnson-Yale, 2005).

PURPOSE OF THE STUDY

The overarching purpose of this study was to examine the role that computer-mediated communication (CMC) plays in the development of student-instructor relationships at the college level. Combining quantitative and qualitative components within the framework of mixed methods triangulation design, this study sought to:

(1) investigate the association between student-instructor computer-mediated communication and student-instructor relationships; and

(2) explore the meanings that college students and instructors make of their computer-mediated communication with each other.

RESEARCH QUESTIONS

The research question that guided the **quantitative** inquiry in this study was:

- To what extent do computer-mediated interactions predict the student-instructor relationships, above and beyond the prediction afforded by demographic variables and face-to-face (f2f) interactions?

The **qualitative** component of this study addressed the following research questions:

- What meanings do students and instructors construct of their computer-mediated communication?

- How do students and instructors negotiate relationships using CMC tools (i.e., email, Blackboard, Facebook, and IM)?

In addition, this **mixed methods** study aimed to answer a question associated with the multilevel triangulation design employed in this study:

- What similarities and differences exist between the meanings that undergraduate students attribute to online interactions and the meanings that instructors make of these interactions?

SIGNIFICANCE OF THE STUDY

Attending to ways in which CMC relates to student-instructor relationships at the college level, I situate my study within the area of inquiry focusing on student-instructor informal or out-of-class interactions. More specifically, this study contributes to the emergent literature on computer-mediated communication between students and instructors within the university setting. Considering that student-instructor relationships are an essential component of learning and of academic and social integration of students in college (Tinto, 1993), it is important to know how the online tools that students and instructors use regularly to communicate with each other (e.g., email and course management systems; Jones & Jonhson-Yale, 2005) may enhance or hinder the development of such relationships. This study expands the knowledge of how online interactions with instructors associate with students' perceptions of student-instructor relationships. In addition, this study explicates the understandings, practices, and norms that students and instructors construct while interacting/communicating with each other via CMC tools.

Another contribution of this study is related to the understanding of informal student-faculty interactions in the larger context of academic community of practice. When the university

at large is viewed as a community of practice, the relationships between students and instructors acquire a meaning that is far more complex than the disparate interactions that occur outside of the classroom. From the legitimate peripheral participation perspective on learning (Lave & Wegner, 1991), student-instructors interactions constitute informal learning of the sociocultural practices of the academic and social communities, which is essential to the development of students as legitimate participants in these communities. The legitimate peripheral participation of students as newcomers to the academic community hinges on their ability to develop relationships with other members of the community (e.g., peers, instructors, administrators) and to access through these relationships the learning resources of the academic community. In addition, this study contributes to the existing literature by making the case for more comprehensive understanding of the student-instructor relationships by including computer-mediated communication along with face-to-face, traditional interactions.

The findings of this study are directed to two main categories of stakeholders associated with the higher education community: faculty members and university administrators. This study provides evidence on whether different communication tools (i.e., email, Blackboard, and Facebook, and IM) have a differential effect on the quality of student-instructor relationships. Understanding how student-instructor interactions mediated by each of the selected online tools contribute to the overall student-instructor relationships can inform instructors about the tools they can use to reach out to students and make themselves available to students. Similarly, the results of this study could be of interest for university administrators regarding the technological means of communication and technological infrastructure that they decide to support.

Moreover, with the qualitative component of this study designed as an in-depth examination of the student-instructor online interactions (i.e., email, Blackboard, Facebook, and

IM), I provide a detailed analysis of the participants' account of their experiences and practices. The qualitative analysis expands the information obtained through statistical analysis beyond associations among variables and reveals the meanings that key participants (students and instructors) give to their online interactions, and the strategies developed to negotiate these interactions. Understanding students' experiences can guide instructors in their use of online tools when interacting with students. Similarly, more detailed information about students' and instructors' experiences can help administrators design better campus strategies to support positive student-instructor relationships.

DELIMITATIONS

This study explored the role of computer-mediated communication in the informal, out-of-class interactions of students and instructors. Formal interactions (face-to-face or computer-mediated) between students and instructors taking place in the classroom within the context of a course or in distance education (online) courses were beyond the scope of this study.

In addition, although I acknowledge that students and faculty might interact through a larger variety of technological tools, to narrow the scope of this research, I limited this study to four categories of computer-mediated communication: email, Blackboard, Facebook, and instant messaging. Several studies showed that email, course management systems, and chat (or IM) are regularly utilized by instructors and students to communicate with each other outside of the classroom (Jones et al., 2008; Jones & Johnson-Yale, 2005; Jones & Madden, 2002). Additionally, Facebook, a social networking site used intensively by college students (Ellison, Steinfiled, & Lampe, 2007; Raacke, & Bonds-Raacke, 2008; Lewis, Kaufman, & Christakis, 2008) is an online environment that, based on anecdotal accounts (Lipka, 2007; Young, 2009), affords student-faculty interactions.

Moreover, this study focused on examining the perceptions, attitudes, and experiences of undergraduate students regarding their interactions with instructors. Graduate students, who are assumed to experience frequent interactions outside of class and closer relationships with their instructors due to the specifics of the graduate education, were not the target of this study.

Finally, the participating instructors in this study were all full-time, tenured or tenure-track faculty. This study purposively excluded graduate teaching assistants on the assumption that graduate assistants who teach undergraduate courses may develop qualitatively different relationships with undergraduate students due to age, time availability, and academic status.

LIMITATIONS

There are several limitations identified for this study. First, the quantitative data collection did not satisfy the conditions of the probability sampling (e.g., random sampling, stratified sampling), which has the potential to enhance the accuracy of statistical inferences. Instead, considerations of access to potential respondents, anonymity, response rate, and overall feasibility have led to the decision to rely on a non-probability sample. Thus, the survey has reached students enrolled in several classes at a public research university. In the absence of a probability sampling, the diversity of the sample was ensured by purposively including students of different class levels (i.e., first year, sophomore, junior and senior students) and several departments within the university.

Another limitation is related to the characteristics of the instructors whom students chose to report on when completing the survey. Students were prompted to think about an *instructor* with whom they interacted the most, with the intention of avoiding reports on student interactions with graduate teaching assistants. However, given that the interview data revealed that some students did not clearly separate between graduate teaching assistants and professors, it

can be suspected that a similar confusion might have occurred for the survey data, as well. Further, this study did not control for the instructors' characteristics, their teaching philosophies and styles, nor for the classroom practices, which all could potentially have an effect on the student-instructor relationship. This limitation however is mitigated by one of the delimitations of this study, the intentional decision to focus on out-of-class interactions.

In addition, although in this study I used the term "student-instructor interaction" to indicate any kind of communication (unidirectional, bi-directional, or multi-directional) between students and instructors, direct or mediated by electronic artifacts, a definition of "student-instructor interaction" was not provided for the respondents in the survey. Due to this limitation, it could not be determined whether students reported limited Blackboard interactions due to limited use of Blackboard or due to their potentially different understandings of the term "student-instructor interaction." In the absence of the definition, it is possible that students did not perceive their access to the instructor's messages, announcements, and materials on Blackboard as a form of student-instructor interaction.

Another limitation arose from the low number of student participants (n = 3) who allowed access to their Facebook profile for the purpose of first-hand data collection on student-instructor interactions within this space. Although the participant observations within Facebook were designed as supplemental and not principal sources of data, broader access to Facebook interactions would have, perhaps, enriched the findings of this study.

Finally, data provided limited information about the use of IM for student-instructor interactions. Only three survey respondents reported IM interactions with instructors, which conducted to the decision not to use the IM variables within regression analyses. At the same

time, the qualitative data did not provide enough information to identify meanings, expectations, and practices related to the use of IM by students and instructors.

DEFINITION OF TERMS

In this section, I provide definitions and descriptions of the key terms that I used throughout this dissertation. Although some of these terms are common, operational definitions serve to clarify their meanings for this study. The terms are presented in alphabetical order.

Blackboard (www.blackboard.com) is a commercial course management system implemented at the research site, which integrates several computer-mediated communication features such as email, file sharing, discussion board, instant messaging, and blog. A screen capture of Blackboard is included in Appendix A.

College as an interactive system. In Tinto's (1993) longitudinal model of student departure from college, college is viewed as an interactive system that consists of "a variety of linking interactive, reciprocal parts, formal and informal, academic and social" (Tinto, p. 118). In other words, the college is composed of a number of overlapping and interwoven communities that develop in interactions between students, faculty members, and staff.

College academic system or community is a term used in Tinto's (1993) theoretical model. The academic system includes formal education in classrooms and laboratories, although it can also include interactions related to academics that occur outside of class.

College social system or community, a term also originating in Tinto's (1993) theory, consists of informal interactions among students, faculty members, and staff, and is concerned with the needs and lives of these members outside of the formal environment.

Community of practice is defined as "a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice"

(Lave & Wenger, p. 98), which form a context favorable to learning of the newcomers (Wenger, 1998). Within a community of practice, the newcomers, engaged in a process of peripheral yet legitimate participation, learn by interacting with other members of the community and by constructing an identity of membership in the community.

Course management systems (CMS) are online platforms such as Blackboard that provide instructors "with a set of tools and a framework that allows the relatively easy creation of online course content and the subsequently teaching and management of that course including various interactions with students taking the course" (Meerts, 2003). In general, these systems embed several tools that facilitate communication between instructors and students such as email, IM (real-time chat), asynchronous discussion board, and blogs.

Email is "a system of world-wide electronic communication in which a computer user can compose a message at one terminal that can be regenerated at the recipient's terminal when the recipient logs in" (Princeton University WordNet). In general, universities in the U.S. provide email accounts to their students and faculty members. Therefore, the assumption in this study was that the majority of student-instructor email communication at the research site occurred through the university's email system and through the Blackboard's email feature. For the survey used in this study, email was operationally defined as email-like electronic communication independent of the system used: university-supported email system, the email function within Blackboard, or any other email provider used by students (e.g., Gmail, Yahoo! Mail).

Facebook (www.facebook.com) is a social network site (boyd & Ellison, 2008) defined by its creators as "a social utility that connects people, to keep up with friends, upload photos, share links and videos" (www. facebook.com). Introduced in 2004 as a Harvard-only college

network, *Facebook* has gradually opened up to other universities and more recently to the large public (boyd & Ellison, 2008). Currently, Facebook has become the preferred social network site of young adults (18-29 years) and adults (30+ years), with more than half of all adults (18+) in the Unites States having a profile on Facebook (Lenhart, Purcell, Smith, & Zickuhr, 2010). For this study, it was important that Facebook was the social network site of choice for the majority of college students in American universities (Hargittai, 2007; Ellison, Steinfieled, & Lampe, 2007; Raacke, & Bonds-Raacke, 2008). A screen capture of Facebook is included in Appendix B.

Instructors/ faculty members. This study explored the role of CMC in mediating interactions between college students and instructors. Of interest for this study were students' interactions with instructional faculty that includes professors, associate professors, and assistant professors whose work responsibilities are not limited to teaching, as well as lecturers and instructors, whose main responsibility is instruction. Throughout this paper, I used the terms "instructors" and "faculty members" interchangeably to refer to these categories of instructional faculty. When using the term "instructor", I referred to the larger meaning of this term, synonymous to "teacher" (Webster Dictionary), and not to its corresponding category of employment. When presenting the findings of qualitative analysis (Chapter 5), I referred to the participating instructors as professors given that all the instructors interviewed for this study were tenured or tenure-track professors. In this study, the category of instructors/ faculty members does not include graduate teaching assistants.

Instant messaging (IM) is a form of CMC that consists of synchronous text-based exchanges between two users. Most of the IM services provide additional features such as audio/video conferencing, group chat, and file transfer (Nardi, Whittaker, & Bradner, 2000).

Instant messaging was operationalized in the survey part of this study as the use of any of the IM services such as *Yahoo! Messenger, AOL Instant Messenger (AIM), Skype, Windows Live Messenger,* and *Google Talk.*

Legitimate peripheral participation (Lave & Wenger, 1991) is learning understood as evolving participation and membership in communities of practice. Learning is the progressive transition from peripheral participation to full participation. Within any community, the newcomers who engage into the sociocultural practices of the community by interacting with other members and by accessing the resources of the community learn these practices and move toward becoming full participants.

Mixed methods research. Defined as a research design that "focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or a series of studies" (Creswell & Plano Clark, 2007, p.5), mixed methods assume that the integration of both approaches "provides a better understanding of research problems than either approach alone" (Creswell & Plano Clark, p.5). More in-depth information about the type of mixed methods design used for this study is provided in Chapter 3.

Out-of-class interactions are defined as communications (unidirectional, bi-directional, or multi-directional) between students and instructors that occur outside of the physical boundaries of a classroom, either face-to-face or using CMC. When CMC tools are used, out-of-class interactions are operationalized as interactions that occur in connection with face-to-face courses. Student-instructor interactions that occur online as part of online courses (e.g., distance education) are not included. This study focused on student-instructor interactions with a variety of purposes, in connection with a particular course or not (e.g., feedback on academic

performance, discussion of grades, advising, informal socializing, greetings, common interests, and research).

Social media, also identified as *me media* (Beer, 2008) or *social software* (boyd, 2008), is one of the domains of Web 2.0, defined as a "suite of Web-based, interactive tools and media, oriented primarily to create a rich and engaging user experience" (Peterson, 2008, p.1). Social media encompasses computer or mobile technologies that facilitate online social interactions such as social network sites, blogging, microblogging (e.g., Twitter), instant messaging, forums, and virtual worlds (e.g., Second Life) (boyd, 2008).

Social network(ing) sites (SNS) are "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (boyd & Ellison, 2007, p.211).

Web 2.0 is a term that frames the online phenomenon of Internet user-generated content, in which "Web users are an integral part of the value that is added to data and their interactions with information (both collectively and individually) can significantly alter the experience of subsequent users" (Peterson, p.1).

ORGANIZATION OF THIS DISSERTATION

This dissertation is organized into six chapters. In the first chapter, I introduced the study and outlined its purpose and research questions. Moreover, I discussed the significance of the study and its limitations and delimitations, and I provided definitions of key terms. The second chapter includes a discussion of the theoretical frameworks that provided the theoretical lenses for this study and the review of the literature pertinent to this study. In Chapter 3, I present the paradigmatic orientation for this study and delineate data collection and analysis. In addition, I

discuss ethical considerations and standards of quality. In Chapter 4, I present the results of the quantitative analysis, while in Chapter 5 I focus on the findings of qualitative analysis. Finally, in Chapter 6, I integrate and discuss the qualitative and quantitative findings and derive implications for practice, and directions for future research.

CHAPTER 2: REVIEW OF THE LITERATURE

The purpose of this study was to investigate the role of technology in mediating out-of-class interactions between college students and instructors. In the first section of this chapter, I describe the two theoretical frameworks that guided this study, Tinto's (1993) concept of social and academic integration in the college community, and situated learning in the community of practice (Lave & Wenger, 1991; Wenger, 1998). In the second and third sections of the chapter, in order to set the context for the study, I review two main areas of literature related to student-instructor interactions outside of class: face-to-face interactions and interactions facilitated by computer-mediated communication (CMC) tools (i.e., email, Facebook, course management systems, and instant messaging). Research in the first content area comes from the field of higher education and is primarily concerned with studying the effects of student-instructor interactions on student outcomes and the factors that can promote or hinder these interactions. While reviewing main findings from this literature, I argue that its exclusive focus on face-to-face interactions is limited and that CMC should be explored as an integral component of informal interactions between students and instructors. The second area of research focuses on the CMC tools that students and instructors use to communicate outside of the classroom.

SECTION 1: THEORETICAL FRAMEWORKS

Within this dissertation, I oriented to theoretical frameworks as "lenses from and through which the researcher looks at the study" (Anfara & Mertz, 2006, p. 7) and as "examples of specific constructions of reality" (Harris, 2006, p.36) that help focus the study and situate it in the larger scholarly discourse. Avoiding use of any theoretical lenses as "predictive frameworks" that dictates data collection and analysis, I instead viewed them as resources that "offered a way

to gain a broader perspective" (Harris, 2006, p.37) on the phenomenon under examination, student-instructor relationship, and to develop an interdisciplinary understanding of this phenomenon.

Student integration into the college communities

One of the theoretical lenses that informed this study was Tinto's (1993) longitudinal model of student departure from college that explains students' voluntary withdrawal from college. This theory highlights "the ways in which the social and intellectual communities that make up a college come to influence" student persistence (Tinto, 1993, p.104). Although this study did not focus on the issue of college student attrition, and therefore I did not fully adopt Tinto's theory, some of the components of this theory (i.e., student integration in the social and academic communities of the college) shaped my thinking of colleges as learning communities. In his longitudinal model of institutional departure, Tinto takes into account a multitude of pre- and post-admission, individual and institutional characteristics that contribute to student integration or engagement in college, which in turn influence student decision to persist or withdraw. Not focusing on student persistence, I did not orient to the "pre-entry" components of the model such as family background, financial resources, and pre-college educational experiences. Instead, I drew upon to notion of college as an interactive system consisting of "a variety of linking interactive, reciprocal parts, formal and informal, academic and social" (Tinto, p. 118). In other words, the college as an interactive system is composed of a number of overlapping and interwoven communities that are made up in interactions between students, faculty members, and staff. In Tinto's view, "colleges are made up of both academic and social systems, each with its own characteristic formal and informal structure and set of student, staff and faculty communities" (p. 106). The academic system or community focuses on formal

education in classrooms and laboratories. The social system consists of informal interactions among students, faculty members, and staff and is concerned with the needs and lives of these members outside of the formal environment. While pointing out the existence of these two main types of communities, academic and social, Tinto emphasized that these communities are "mutually interdependent and reciprocal" (p. 119). Thus, interactions and events occurring in the academic community reverberate in the social community and vice versa. For example, the lack of social integration (i.e., social isolation) may prevent students from accessing the learning resources of the community and therefore set them up for academic failure. From the opposite direction of influence, learning experiences in the classroom may come to "enhance social relations among students outside of class", which fosters social integration (Tinto, p. 109). Within each of the academic and social communities, formal and informal domains of interaction and learning can be identified. These domains are also interdependent such that interactions occurring in the formal domain echo in the informal domain and vice versa. For example, student-faculty interactions in the classroom may channel the way students approach instructors outside of class for informal interactions. Conversely, informal interactions outside of classrooms, laboratories, offices (e.g., work with a professor on a research project) are thought to foster integration in the academic community of the college by engaging students in diverse academic activities.

According to Tinto's model, success and persistence in college hinge on integration and "competent membership in [the academic and social] communities" (Tinto, 1993, p.121). Interactions between students, faculty members, and staff, who are participants in these communities, are viewed as "central to the development of the important social bonds that serve to integrate" students within the college communities (Tinto, 118). The most important

relationships that contribute to student academic and social integration are those formed with faculty members and peers. Interactions with instructors both in-class (formal) and out-of-class (informal) have the role to facilitate primarily academic integration, although they can also contribute to social integration. Rewarding student-instructor interactions outside of class can foster "exposure of students to multiple dimensions of academic work and therefore indirectly lead to heightened levels of formal performance" (Tinto, p.118). When interactions with faculty members outside the classroom are missing, negative effects such as academic apathy or underachievement may hinder academic integration. At the same time, student relationships with peers have an essential role in fostering membership in the social community of the college. Thus, Tinto argued "the greater the contact among students, the more likely individuals are to establish social and intellectual membership in the social communities of the college and therefore the more likely they are to remain in college" (p. 118).

Further accentuating the interconnected nature of the academic and social systems, Tinto (1993) noted that these communities might pursue consistent goals and therefore work to complement each other in reaching the goal of student retention. However, in some colleges, the values and norms of academic and social communities may compete with each other and therefore "it is entirely possible that integration in one system of the college may constrain, or at least make more difficult integration in the other" (Tinto, p. 119). Dissonance between these systems appears, for example, when the peer pressure for social integration prevents students from engaging into academic work or when, under intense academic press, students do not have time to invest in building relationships with peers.

At the same time, the theory recognized that the academic and social communities of the college include a variety of other sub-communities. Thus, it is possible for students to gain

simultaneous membership in several different communities (e.g., residential community, clubs, research teams), which allows participating students to perform multiple roles. While some of these communities are situated at the center of institutional life, others might be located at the periphery. According to Tinto (1993), engagement in multiple college communities can be beneficial to student retention as long as these communities do not have conflicting values and goals. In addition, the theory acknowledges the importance of the communities external to college (e.g., family, work, group of friends other than college peers), which through their values, norms, and practices can be supportive of or antagonistic to student commitment to college.

Although Tinto's (1993) theoretical model was not explicitly identified as a theoretical framework from the beginning of this study, the notions of academic and social integration in the college communities and the value of student-instructor interactions outside of class guided my approach early on, starting with data collection, especially for the quantitative part of the study. The idea that out-of-class interactions between students and instructors contribute to formation of relationships that can be supportive of student academic and social integration is visible in the way I designed the survey instrument and in my approach to quantitative data analysis. On the other hand, this theoretical frame was less influential in the design of qualitative data collection and analysis. In preparing to interview students and professors about their face-to-face and computer-mediated interactions outside of class, I was sensitive to the distinction between academic and social, formal and informal interactions, although I did not explicitly attempt to identify support for this theoretical model through interview data. Moreover, during data analysis, I did not seek to apply Tinto's frame to qualitative data. Instead, I adopted an open coding approach to data analysis.

While Tinto's (1993) model guided my understanding of college as a system of interconnected academic and social communities, it did not provide an explanation on how these communities develop, function, and support learning. The related theories of situated learning (Lave & Wenger, 1991) and communities of practice (Wenger, 1998) serve this purpose.

Legitimate peripheral participation and learning in communities of practice

In this study, I regarded the interactions between college students and instructors outside of class as informal learning events (Bransford et al., 2006) taking place within the college community. In doing so, I capitalized on sociocultural perspectives of learning and more specifically on the theory of situated learning as legitimate peripheral participation in communities of practice (Lave & Wenger, 1991). I also drew upon Wenger's (1998) understanding of learning in communities of practice. These theories provided a framework for understanding the role of student-instructor interactions (face-to-face or computer-mediated) as sources of informal learning for students about the sociocultural practices and norms of the college community. From this perspective, learning is defined as evolving participation and membership in communities of practice or, in other words, legitimate peripheral participation. Learning is the progressive transition from peripheral (i.e., partial) participation to full participation. Within any community, the "newcomers" who engage into the sociocultural practices of the community by interacting with other members (e.g., other newcomers, old-timers or anyone in between) and by accessing the resources of the community, learn these practices and move toward becoming "full participants." For learning to occur, it is necessary that newcomers have a status of *peripheral* yet *legitimate* participants. Peripherality entails partial participation in the social practice of the community (with the underlying goal of moving toward full participation), while legitimacy presupposes the member's sense of belonging to the

community of practice and recognition of membership on behalf of the other members (Lave & Wenger). Wenger argued that peripherality and legitimacy assume openness on behalf of the community to include new members. To gain full membership, newcomers need legitimate access to three dimensions of the practice: "to mutual engagement with other members, to their actions and their negotiation of the enterprise, and to the repertoire in use" (Wenger, p. 100). Only by starting as peripheral and legitimate members of the community, newcomers can achieve learning in practice because in this way "their inevitable stumblings and violations become opportunities for learning rather than cause for dismissal, neglect, or exclusion" (Wenger, p. 101). Thus, legitimate peripherality designates a safe place for learning and becoming full participants in the community.

The concept of community of practice is defined as "a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice" (Lave & Wenger, 1991, p. 98). In Lave and Wegner's view, the existence of clear boundaries around a specific group of people is not an essential characteristic of a community; instead, a community depends on the participants' shared understanding of "what they are doing and what that means in their lives" (p.98). Given that communities do not form in isolation, participation in a community of practice is not exclusive and individuals can simultaneously participate in a multitude of communities.

Moreover, a community identifies itself through a set of sociocultural norms and a shared language or discourse. "Learning how to speak as a full member of a community of practice" (Lave & Wenger, 1991, p.106) is a key aspect of legitimate peripheral participation. It is through talk/ discourse of a community of practice that newcomers learn the sociocultural norms of the community. The discourse of the community serves multiple purposes: "engaging, focusing, and

shifting attention … on the one hand; and supporting communal forms of memory and reflection, as well as signaling membership, on the other hand" (Lave & Wenger, p.109).

Describing the concept of learning as participation in practice, Wenger (1998) argued that learning includes three interrelated processes: developing mutual relationships or mutual engagement; defining and refining a joint enterprise; and developing a shared repertoire. Highly dependent on interactions between members, mutual engagement is more than membership or belonging to a group of people; it is a sustained nexus of relationships organized around the practice. A joint enterprise develops in the process of negotiation of meaning between participants and is a shared goal that "creates among participants relations of mutual accountability that become an integral part of the practice" (Wenger, p. 78). The shared repertoire is negotiated in interactions between the members of a community and includes a series of physical and cultural artifacts such as tools, norms, routines, symbols, concepts "that the community has produced or adopted in the course of its existence" (Wenger, p. 83).

Examined through the lens of Lave and Wenger's (1991) theory, student-instructor informal interactions are a form of student learning/ participation in the sociocultural practices of the academic community. As participants in the academic community, students and instructors act upon different roles: "while the learners [i.e., college students] are newcomers and potential reformers of the practice, the teachers are the preservers of its continuity" (Sfard, 1998, p. 6). Due to these competing tendencies and existing relations of power, tensions and conflicts are inherent to legitimate participation. In addition, students as newcomers have to find ways to develop relationships with old-timers, both peers and instructors, in order to "gain access to the community and its practice" (Wenger, 1998, p. 100). At the same time, there is a need for instructors as old-timers to be willing to spend "energy introducing these newcomers into the

actual practice of their community" (Wenger, p. 100). Given that sometimes the official recognition for the efforts of the old-timers is limited, further tensions can appear. However, as Lave and Wenger (1991) argued, the relational dynamics between members and community, although at times marked by tensions, is a co-transformative process. On one hand, the newcomer's identity is shaped in the process of becoming a full participant, and, on the other hand, the community of practice changes by incorporating the evolving membership of the newcomers.

Using Lave and Wenger's (1991) perspective on learning as participation in communities of practice as an a priori theoretical lens has inherently shaped my research design. In viewing students and instructors as members of the college community, I was sensitive to the need to document the experiences and perceptions of both categories of participants regarding the use of online tools for out-of-class communication. Moreover, during qualitative data collection and analysis I paid heightened attention to the negotiation of meanings and practices among students and professors, being aware that in communities of practice norms, rules, practices, and meanings that participants ascribe to these are constantly negotiated. During interview data analysis, I attempted to notice the repertoires of meanings that students and professors shared, while also paying attention to potential incongruities.

SECTION 2: FACE-TO-FACE INTERACTIONS OUTSIDE OF CLASS

A large body of literature has examined student-instructor relationships, conceptualizing them as "out-of-class interactions" in connection or not with specific courses. Starting as early as the 1950s, higher education scholars have examined the quantity and quality, as well as the purpose of student-faculty out-of-class (OOC) interactions (Pascarella, 1980). Most of this literature explored OOC interactions as predictors of college student outcomes.

Out-of-class interactions and student outcomes

A large body of research, which was extremely prolific between the1960s and1980s, produced substantial empirical evidence suggesting that frequent and qualitatively superior student-instructor OOC interactions have a positive effect on a variety of student outcomes. In an extensive literature review of the studies published prior to 1980, Pascarella (1980) cited substantive evidence showing that informal student-faculty interactions associated positively with students' satisfaction with college, aspirations for higher educational degrees, first-year persistence, academic achievement, and intellectual and personal development. Studies published more recently confirmed and detailed these findings. For example, Kim and Sax (2009) found that the frequency of research-related and course-related interactions with faculty members outside the classroom was a significant predictor of student academic achievement (college GPA). Similarly, using data from the National Survey of Student Engagement (NSSE), Rugutt and Chemosit (2005) showed that senior students who interacted frequently with faculty members outside of class had higher GPAs than students who had rare interactions. However, the direction of this relationship was not determined. Focusing on both the quantity and quality of interactions with instructors, Anaya and Cole (2001) explored the link between these interactions and Latino/a students' academic achievement. The quality, as well as the frequency of OOC communication with instructors (e.g., "talked with faculty") had a significant effect on students' grades (when variables such as gender, class, type of institution, class level, residence arrangement, aspiration for advanced degrees were accounted for). Socializing interactions (e.g., had coffee with faculty members), on the other hand, did not significantly relate to grades. In this study, which analyzed data from the College Student Experiences Questionnaire (CSEQ), the quality of student-faculty informal contact was measured via one item evaluated on a 7-point

scale. In an earlier study, Pascarella and Terenzini (1981) suggested a similar association between student GPA and interactions with instructors. Analyzing longitudinal data, they found that students living in an experimental residence arrangement, which fostered intense student-faculty interactions, had higher GPA than students in the control group, and more importantly, the interaction with faculty members accounted for this GPA difference.

Several studies centered on the influence of student-faculty interactions on self-reported learning gains. For instance, using data from the CSEQ, Lundberg and Schreiner (2004) found that the quality of interaction with instructors had a significant effect on self-reported learning. Moreover, the frequency of interactions was a better predictor of learning when the interaction inspired students to work harder. They measured learning via a 25-item scale targeting a variety of learning gains (e.g., write clearly, understand science, think analytically). The frequency of interactions was measured on a 13-item scale including frequency on several purposes of interaction, while the "quality of relationships with faculty" (Lundberg and Schreiner, p.554) was measured via the same one item of the CSEQ. Using a sample from the same a dataset based on the CSEQ, Kuh and Hu (2001), employed factor analysis and identified three categories of student-faculty interactions: substantive academic or career-related; personal and social contact; and writing improvement interactions. They found that the relationship between frequency of interactions and learning gains is mediated by the effort students invested in other educational activities because of interacting with instructors.

Satisfaction with college is another type of student outcome examined in connection to students' interactions with instructors. Using a large sample based on the California Undergraduate Experience Survey, Kim and Sax (2009) found that students who had more course-related interactions with instructors reported higher levels of satisfaction with college.

Based on a different instrument (CSEQ), Kuh and Hu (2001) identified a significant indirect effect of student-faculty interaction on satisfaction with college. The frequency of interactions influenced the amount of effort students devoted to other educational activities, and this in turn affected students' satisfaction with college.

Additionally, the literature published after Pascarella's (1980) review provided empirical support for positive effects on student aspirations for advanced educational degrees. Kim and Sax (2009), for instance, found that "students who assisted faculty with research [outside of class] were more likely to … aspire to higher degree attainments" (p.447). Iverson, Pascarella, and Terenzini (1984), on the other hand, tested a non-recursive model and identified a different direction of association. They concluded that it is more likely that students who initially aspire to higher educational degrees pursue more contact with faculty members. Therefore, further inquiry is needed to establish the direction of association between the interactions with instructors outside of class and student aspirations for higher degrees.

In summary, these findings revealed that informal interactions with instructors contribute to student academic achievement (i.e., college GPA and self-reported learning) as well as to student satisfaction with the college experience. However, a closer examination of these studies reveals several limitations. First, there is a lack of consistency regarding the definition of student-instructor out-of-class interactions. A majority of research focused exclusively on the frequency of interactions (e.g., Kim & Sax, 2009; Kuh & Hu, 2001; Bean & Kuh, 1984). Although information about the amount and nature of the interactions can be useful in a preliminary stage to assess general trends and practices at campus-level, inquiry about the nature and quality of such interactions should naturally follow. However, studies that further look at the effect of the quality of interactions are extremely rare. The few studies that have examined both

variables, quantity and quality of interactions (e.g., Lundberg & Schreiner, 2004; Anaya & Cole, 2001), derived the variable of quality of interactions from a one-item scale of the CSQE. In his extensive review of literature, Pascarella (1980) argued that student-faculty informal contact is most likely a multidimensional construct and therefore is more appropriately measured by several indicators instead of one. The four dimensions proposed by Pascarella are:

> (1) contextual or demographic factors (Who initiated the interaction – faculty member or student? Is the interaction occurring with a faculty member in the student's major field?); (2) exposure (frequency or amount of interaction during a certain time period); (3) focus (purpose or purposes of interaction); and (4) impact (quality of, or satisfaction derived from interaction) (p. 567).

Pascarella (1980) argued that most of the research conducted before 1980 has employed "a unidimensional and perhaps somewhat oversimplified operational definition of student-faculty informal contact" (p. 567), focusing mainly on quantity and purpose of interactions, separately, with little attention to a more comprehensive, multidimensional approach. Research published since has perpetuated the same unilateral approach. The vast majority of studies relied exclusively on quantitative analysis to explore the informal interactions between student and instructors. These studies usually used data from nationally employed instruments. Examples of such instruments are the College Student Experiences Questionnaire (CSEQ), developed by Pace and Kuh (1998) (Lundberg & Schreiner, 2004; Kuh & Hu, 2001; Anaya & Cole, 2001), the National Survey of Student Engagement (Rugutt & Chemosit, 2005), or the CIRP Freshman Survey and the College Student Survey from the Higher Education Research Institute (Iverson, Pascarella, & Terenzini, 1984). The problem with these instruments is that they use very simplified definitions of student-faculty interactions (Cox & Orehovec, 2006), limited to a

handful of behaviors, which do not situate these interactions within the frame of relationships that develops as students integrate in the academic and social communities of the college.

Factors predicting out-of-class interactions

While a very large segment of the literature focused on student outcomes as correlates of students' informal interactions with instructors, there are comparatively fewer studies inquiring about student and instructor variables that might be responsible for frequent and meaningful interactions. Understanding this facet of the problem is especially important given that at many institutions student-instructor interactions outside of class are relatively rare (Pascarella, 1981; Cotten & Willson, 2006; Cox et al., 2010). In this direction, surveying a large sample of instructors (n = 2,845) from 45 universities, Cox et al. (2010) investigated the role of several exogenous variables as well as instructors' teaching style in connection to the amount of informal interaction with freshman students. Incorporating previous qualitative research findings, they developed a survey instrument that included two types of interaction: casual (e.g., greetings, casual and non-academic conversations) and substantive (e.g., course-related, career-related, or personal matters). Findings revealed that the majority of instructors had very infrequent substantive interactions with freshmen. Gender and type of employment were significant factors, with female instructors and part-time instructors reporting fewer interactions with students than their male and full-time colleagues, respectively. Interestingly, teaching styles and pedagogical approaches contributed in a small proportion to the frequency of student-instructor OOC interactions, showing that "faculty members' in-class behavior [do not] serve as signals to students indicating an instructor's openness for out-of-class contact" (Cox et al., p. 6).

Qualitative studies explored the dynamics of student-instructor OOC interactions when institutional efforts designed to foster meaningful interactions were in place. Conducting focus

groups with 49 undergraduate students at a research university, Cotten and Willson (2006) found that, while student-instructor interactions were generally infrequent and mostly built around getting help from instructors with a specific assignment, some students participating in mentorship programs reported more frequent interactions. A lack of awareness about the benefits of interacting with instructors for more than assignment-related assistance emerged from the accounts of those students who rarely engaged in interactions. One interesting association shared by participants was that when students interacted closely with instructors outside of class, they tended to study harder in order to meet the instructors' expectations and avoid disappointing them. According to Cotten and Willson, an explanation of students' lack of initiative in interacting with instructors was that students "prefer to avoid actions that might increase their self-imposed work effort, or they may prefer to avoid the risk of not living up to someone's perceived expectations" (p.500). In addition, students' reasons for not seeking interactions were related to uncertainty about instructors' availability for interactions; fear of non-responsiveness; perceptions of limited personal disclosure; feelings of intimidation; time constraints; and previous negative experiences with some instructors.

In a grounded theory study, Cox and Orehovec (2007) provided further insights on the students' meanings of their interactions with faculty members outside of class. They explored the perceptions of students who had intense contact with faculty members in the context of a residential learning community (residential college) at a large public research university. Their dynamic typology included, "in the descending order of frequency: disengagement; incidental contact; functional interaction; personal interaction, and mentoring" (p.350). Disengagement was defined as lack of OOC interactions between students and faculty members. Although given numerous opportunities for informal interaction within the setting of the residential college (e.g.,

residential college-wide dinners, “teas”, lectures and banquets), a majority of students and faculty members associated with the residential college ignored such opportunities and displayed lack of initiative for interaction, even when present in each other’s physical proximity. When interactions took place, these consisted most often of “incidental contact” (p.352) (e.g., greetings and polite exchanges performed perfunctorily). Functional contact was related to discussions of academic or institutional issues. Personal interactions consisting of discussions about personal interests, although relatively rare, were seen to contribute to the development of student-faculty interpersonal relationships. The participants associated great value to this type of interaction, which helped them perceive the professors as “more human and less institutional” (p.355). The most intense, beneficial, and at the same time, rare type of interaction was mentoring. Only one participant in this study described being involved in a mentoring relationship with faculty members associated with the residential community. On the other hand, all faculty members interviewed for this study “viewed themselves as mentors to students” (p.356), which evidently reveals a mismatch of perceptions between students and faculty members.

Given that a large body of research has documented very limited student-instructor interactions outside of class in spite of considerable financial and human effort on behalf of the universities, it is surprising that little inquiry exists in the area of higher education on the role of technology in facilitating student-instructor interactions. The following section includes a review of the emerging literature focusing on the use of online tools for student-instructor communication.

SECTION 3: STUDENT-INSTRUCTOR COMPUTER-MEDIATED COMMUNICATION

Computer-mediated communication tools such as email, course management systems (CMS), and instant messaging (IM), despite their short history, have become rapidly

incorporated in higher education, with potential to facilitate student-instructor communication (Jones & Jonhson-Yale, 2005) and to compensate for a series of problems that seem to explain infrequent face-to-face interactions with instructors. For example, some of the reasons for which college students avoid interacting face-to-face with instructors on a regular basis are lack of certainty about instructors' availability for interactions; perceptions of instructor non-responsiveness and limited disclosure; and time constraints (Cotten & Willson, 2006). A closer look to these motives reveals that computer-mediated communication (CMC) is an appropriate alternative to address these challenges. For instance, interactions via email and course management systems can reduce students' fears about the instructor's availability by affording asynchronous communication, which provides the option to respond at convenient time and place (Willis & Coakes, 2002). In addition, CMC applications that create platforms for social interaction (e.g., Facebook, MySpace) are increasingly popular among students. Research estimates that college students are among the most enthusiastic Facebook users, with reports of use ranging most often between 85% and 95% at some universities (Hargittai, 2007; Ellison, Steinfiled, and Lampe, 2007; Raacke & Bonds-Raacke, 2008; Lewis, Kaufman, & Christakis, 2008). These applications could foster more disclosure between instructors and students (Mazer, Murphy, & Simonds, 2007), which in turn could encourage more out-of-class interactions.

Emergent research has reported students and instructors' preference for CMC applications such as email, course management systems, and IM in their interactions (Jones & Jonhson-Yale, 2005). However, what is known about their role in mediating such interactions is limited to the frequency of adoption (Hickerson & Giglio, 2009) and comparisons of comfort levels or preference when using a medium or another (Kelly, Keaten, & Finch, 2004). On the

other hand, social networking sites have been largely unexplored in connection to student-instructor interactions.

Student-instructor email communication

One of the most used CMC applications in higher education, email has become a ubiquitous technology to facilitate interaction between students and instructors. In 2004, 92% of the instructors participating in a national survey (n = 2,316) reported having used email to communicate with students (Jones & Jonhson-Yale, 2005). Moreover, communication with students has increased due to email for 73% of instructors. When email and face-to-face communication were compared, only one third of instructors used more face-to-face than email interaction; another third of instructors used both media in a similar proportion, while the other third used more email than face-to-face interaction. Student data from a complementary survey conducted by the Pew Internet and American Life Project first in 2002 (Jones & Madden, 2002; n = 2,054) and then in 2005 (Jones, et al., 2008; n = 7,421) revealed the student perspectives on email communication with instructors. Although email was still the most popular means of communication with instructors among the CMC tools (e.g., chat, instant messaging, wiki, course management systems), Jones et al. (2008) reported a decrease in student preference for email use to communicate with instructors, from 94% in 2002 to 79% in 2008. At the same time, a wide majority of students (89%) in the 2002 sample reported being contacted via email by instructors with course-related announcements and information. These findings showed that email was intensively used for student-instructor communication, with instructors initiating email communication more than students did. Interestingly, considering that student use of Internet (in general) to communicate with instructors has stayed at similar levels (87% in 2002 to 84% in 2008), the decline in student use of email seems to indicate that students might begin to

favor other online tools than email for student-instructor communication. At the same time, face-to-face communication with instructors remained very important to students, with a majority of students (53%) in the 2005 Pew sample reporting more face-to-face interaction with instructors than email communication.

Among the advantages of email communication with students, instructors (n = 259) acknowledged its efficiency due to easiness and timeliness of reaching out to students and keeping records of communication (Duran, Kelly, & Keaten, 2005; Willis & Coakes, 2002). From a student perspective, time and place convenience were key benefits that justified the majority of email exchanges with instructors (Waldeck, Kearney, & Plax, 2002). Moreover, given that email is as an asynchronous tool which allows for reflection, instructors considered that shy students might feel more comfortable to share via email questions and ideas that they otherwise would not communicate (Duran, Kelly, & Keaten). In this direction, using a sample of students (n = 596) from a college of business administration, Lightfoot (2006) found that 75% of students reported spending more time thinking about the email message when communicating with the instructor as compared to face-to-face communication. Results of logistic regressions indicated that students who were more comfortable with technology were more likely "to put more thought into their email communication" (p. 223) than students who were less comfortable with technology. In addition, female students were more inclined to reflect more on the email message sent to instructors than male students were.

The main drawback of using email for student-instructor communication consisted of the impersonal feeling of email messages due to emphasis on text and lack of non-verbal contextual and social cues, which can potentially produce ambiguity and misinterpretation of the message (Lightfoot, 2006). In addition, massive amounts of emails received by instructors on their public

addresses might prevent timely reply (Willis & Coakes, 2002; Jones et al., 2008). Moreover, email communication comes with the risk that not all students read instructors' messages especially if they are lengthy and too frequent.

Looking at preference for media, Taylor, Jowi, Schreier, and Bertelsen (2011) investigated undergraduate student preference for email versus face-to-face when communicating with academic advisors, separately for three communicational goals: instrumental (task-oriented), relational (sense of immediacy), and self-presentational (impression management). Employing *t*-tests, they found that for each of the three goals, some of the students (n = 300) preferred face-to-face communication with advisors to email communication. In addition, gender differences were identified, with male students preferring face-to-face communication more than female students when trying to achieve self-presentational goals.

Research examining the content or purpose of student-instructor email communication showed that students and instructors rely on email primarily to exchange course-related information. For example, analyzing data from a nation-wide survey, Jones and Jonhson-Yale (2005) found that instructors used email most frequently to announce course-related issues (95%), to offer assignment-related clarifications (71%), and to deal with attendance issues (62%). Duran, Kelly, and Keaten (2005) reported similar findings from a survey of instructors at two universities. In addition, they found that instructors perceived "the predominant reasons students send email to be excuses, followed by course-related contacts, and then concern for grade" (p. 167). Jones et al., (2008) found that students' reports corroborated instructors' perceptions. Students' main purposes for using email to communicate with professors were to schedule appointments with the instructor, send assignments (78%), obtain clarifications about assignments (68%), report absences (68%), and discuss grades (56%). Interestingly,

approximately half of the surveyed students used email "to express ideas to a professor that they would not have expressed in class" (Jones & Madden, 2002, p.11). A majority of students considered that "relationships with their professors have been positively affected by email and Internet communication in general" (Jones & Madden, p.8) and more than half of students (56%) declared that "email has enhanced their relationship with professors" (p.10). In a survey study of instructor perceptions of email communication (Yates, Adams, & Bruner, 2009) more than half of the participating instructors (n = 7,002) agreed that email "enhanced the relationships that they have with their students" (p. 315), while 82% of instructors declared that email increased student-instructor communication.

Using factor analysis to examine students' motives (n = 289) for communication, Waldeck et al. (2002) identified three main categories of motives: personal/social, procedural, and efficiency. Personal and social motives included self-disclosure, communication of feelings, and intention to impress the instructor. Although essential to student-instructor relationship building, email exchanges for personal/social reasons were the least frequent among these students. Students used more frequently clarification (procedural) emails requesting course-related information and feedback from the instructor. Efficiency motives were concerned with avoiding "wasting either their own or the teacher's time and to minimize face-to-face or phone contact.

A study analyzing artifacts of freshman students' email exchanges (Gatz & Hirt, 2000) found that, in general, out of the total number of emails that students sent and received, only a small proportion (8%) were related to academics (e.g., contact with instructors; advising; access to library resources). Approximately half of these were exchanges between students and instructors, with the majority (83%) initiated by instructors. Relatively rare (14%) were also

emails that reflected efforts of social integration (e.g., leadership activities; career exploration; participation in campus organizations). Findings of limited student-instructor email communication for personal and social purposes corroborate with research on face-to-face interaction, which reported that socializing interactions had the least occurrence.

Taking into account students' evaluation of email use, Waldeck et al. (2002) found that students who used email frequently for any purpose tended to be more skeptical about the quality of email exchanges with instructors, which points to the complexity of email communication and online communication in general and about the dynamics of student-instructor relationships. Perhaps when interactions with instructors are frequent, it is more likely that students are exposed to more experiences, both positive and negative, and negative experiences might shape student perceptions. In addition, when communicating about coursework, students were more likely to reach out to peers than to their instructors.

On the other side, instructors perspectives were investigated experimentally, testing the impact of the quality of student emails on instructors' perceptions. Stephens, Houser, and Cowan (2009) found that, when presented with overly casual email messages, instructors (n = 152) reported less positive affect (liking) and less willingness to comply with students' requests. Furthermore, student's credibility was diminished when the messages were too casual. These findings indicate that instructors "might view this out-of-class communication similar to assigned written work" (p. 319) and therefore maintain similar expectations for email written performance.

In conclusion, efficient and inexpensive, email is a tool that supports student-instructor communication. While being extensively used by a majority of students and instructors to exchange course-related messages, email is seldom used to interact at a personal level. Given

that instructors perceive email communication with students as formal, they seem to hold expectations that students' messages be written using proper grammar and formal expression. However, in general both students and instructors seem to agree that due to email they communicate more with each other and their relationships are enhanced.

Student-instructor interactions via Facebook

Although the body of literature on student use of Facebook has steadily expanded in the past years, the number of studies on the role of social network sites and Facebook, in particular, in mediating student-instructor relationship is limited. A few studies explored different aspects of student and instructor use of Facebook, with most of them focusing on student reactions to instructor participation on this site. The common denominator of the studies reviewed below is the examination of student reactions based on hypothesized interactions with instructors, having prompted students to think about possible interactions as opposed to actual ones. Although non-user attitudes are important to acknowledge, it can be assumed that meaningful differences might exist between the attitudes of students who interact with instructors on Facebook and those who only hypothesize such interactions. None of these studies reported how students and instructors used Facebook to interact with each other.

Hewitt and Forte (2006) employed a survey to examine students' attitudes towards sharing Facebook with instructors. They found that two thirds of the participants (n = 136) considered acceptable instructors' presence on Facebook and felt comfortable sharing the site with instructors. However, these attitudes took into account instructors' separate use of Facebook and not student-instructor Facebook interactions. When referring to interactions with instructors on this site, the students who did not feel comfortable with such interactions were concerned with instructor's professionalism and credibility, and student privacy and impression

management. At the same time, students' positive comments articulated the ideas of potentially knowing instructors better and creating alternative means of communication. While providing interesting insights into student perceptions of interacting with instructors on Facebook, this study's main limitation is the relatively low number of students who responded based on seeing the instructor's Facebook profile (n = 38) or having a Facebook connection with the instructor (n = 20).

Further exploring the appropriateness of student-faculty Facebook interactions, a more recent study (Teclehaimanot & Hickman, 2011) employed a paper-based survey to investigate college student attitudes towards "appropriate" interactions with instructors. Appropriate interactions were defined as online behaviors "with which the students are comfortable" (p.21). Undergraduate and graduate students (n = 52) at a public research university were asked to report on a Likert-type scale (strongly agree to strongly disagree) the perceived appropriateness of several active behaviors (e.g., sending messages, commenting on pictures or status updates) and passive behaviors (e.g., visualizing profiles, looking at pictures, watching videos) separately for instructors and students. Respondents had to "assume their professor had a Facebook account" (Teclehaimanot & Hickman, p.22). Results indicated that, in general, passive behaviors were more acceptable than active behaviors. Thus, students did not mind the instructors' presence on Facebook as long as the interaction was minimal and mediated by digital content (e.g., pictures, videos, profiles). However, they felt less comfortable with active interactions with instructors such as textual exchanges (e.g., posting, commenting, sending messages). Specifically, students rated "poking[1]" as the most inappropriate Facebook interaction between students and instructors. Additionally, students viewed actions such as commenting on pictures and videos as

[1] Poking is an action in which the user presses a tab provided on Facebook, which is meant to send a quick "hello" to another user.

inappropriate. The most acceptable behavior for both instructors and students was viewing each other's profile.

Similarly, exploring students' acceptance of Facebook friend requests from different categories of persons, Karl and Peluchette (2011) found that students (n = 208) "were most likely to accept friend requests from their mother, followed by their boss, then an unknown professor, and they were least likely to accept one from their worst professor" (Karl & Peluchette, p. 219). The categories of potential Facebook friends were *mother*, *boss*, *new professor*, and *worst professor*. An unknown or new professor was a professor for one of the preregistered classes, whom the student had not met, while the "worst professor" was a professor with whom the student had the worst relationship that semester. The finding that the parent and the boss were accepted as Facebook friends over "new professors" and the "worst professor" is not surprising given that the categories of "mother" and "boss" did not contain any threatening indicators such as "worst" or "new". In other words, the results could have been very different, for example, if the boss was qualified as "bad" or "new." Surprisingly, the category of *professor* in general (not *new*, not *worst*) was not included, which is an important limitation of this study. Therefore, no conclusion can be derived from this study in relation to student reactions to receiving friend requests from their "regular" professors.

Two studies tested experimentally the relationship between instructor disclosure of information on Facebook and student perceptions related to motivation, affective learning, class climate, and instructor credibility. Mazer, Murphy, and Simonds (2007) conducted an experimental study in which the Facebook profile of a female graduate teaching assistant was manipulated to display different degrees of information disclosure. Students (n = 133) were randomly assigned to one of the three experimental conditions and were asked to log into their

Facebook account, search the profile of a specific instructor, and explore it with the purpose of forming "an impression of what it would be like to be a student" in the instructor's class (Mazer et al., p. 7). Next, the participants shared their reactions through a questionnaire. Findings showed that students in the "high teacher-disclosure" group anticipated higher levels of motivation and affective learning for the instructor's class, with small effect sizes, however. At the same time, students exposed to the high-disclosure and medium-disclosure profiles were more likely to anticipate positive classroom climate than those in the low-disclosure group. In addition, comments on open-ended questions revealed that "students were highly concerned with how the teacher would be perceived as a professional" (Mazer et al., p. 14). Exploring further the ideas emerged in the previous study, Mazer, Murphy, and Simonds (2009) tested experimentally the hypothesis that for students (n = 129) high levels of instructor disclosure on Facebook are associated with high levels of instructor credibility. The same experimental setup was used to evaluate student perceptions of instructor credibility measured on three dimensions: competence, trustworthiness, and caring. Results of analysis of variance showed that students in the high-disclosure group, exposed to more information about the instructor via the Facebook profile, were more likely to perceive the instructor as caring and trustworthy. No significant difference was found in relation to instructor competence. Therefore, it appears that instructor disclosure of personal information via Facebook plays a role in student perceptions of instructor credibility. Although these two studies did not rely on dynamic Facebook interaction between students and instructors, in that the exchange of information was unidirectional (students accessed the GTA's profile), their relevance resides in revealing students' expectations and beliefs when it comes to sharing Facebook with instructors. However, since these studies focused on students' anticipated motivation and affective learning in laboratory conditions, transferability of findings can be

expected to be problematic given that in the context of a real classroom many more aspects can shape students' motivation and perception of the classroom climate.

Using a survey design with a large sample of students (n = 528) at a research university, Mendez, Curry, Mwavita, Kennedy, Weinland, and Bainbridge (2009) explored the association between student-instructor connections on Facebook and student self-reported GPA. Results of *t*-tests revealed that students who had at least one instructor among their Facebook friends had significantly higher GPA than students who did not have instructors as Facebook friends. Although interesting, this finding does not infer any causal relationship. Given that the direction of the relationship was not tested, two explanations were offered. First, "higher performing students may feel more comfortable befriending a faculty member than low-performing students" (Mendez et al., p. 7). Second, instructors might be more inclined to accept friend requests from higher achieving students who demonstrated interest in their courses than from low achieving students. In addition, a different direction of influence can be hypothesized: close relationships with instructors reflected by the Facebook connection might positively influence student grades. However, none of these explanations were verified in this study. In addition, results showed that almost one third of the respondents had connections on Facebook with at least one faculty member. More than half of students declared that they were inclined to enroll in an instructor's course if they liked the instructor's Facebook profile. A similar percent (53%) of students reported that they were inclined not to register for a class if they did not like the instructor's profile.

Changing the focus from student reactions to include both student and instructor attitudes, Roblyer, McDaniel, Webb, Herman, & Witty (2010) compared instructor and student adoption of Facebook and their attitudes toward using this site in college classes. Separate online

surveys were administered to undergraduate students (n = 120) and instructors (n = 62). Results showed that students were more likely to have a Facebook account than instructors were; yet, there were no differences in the frequency by which students and faculty checked their account. At the same time, both groups reported limited use for educational purposes. This study did not check for other variables that might play a role in the use of Facebook. For example, the results could be interpreted inadequately as if being an instructor is associated with low, infrequent use and negative attitude towards using Facebook for educational purposes. Yet, other variables such as age, gender, college affiliation might also explain the likelihood of having an account and the intensity of use.

The only qualitative study identified thus far on student-instructor interactions on social network sites (SNS) examined the perspective of instructors at a university in the UK (Jones, Rhys, & Jones, 2011). While the instructors in this study discussed their perception of social network sites in general, most of them were aware only of the two most popular sites among college students: Facebook and MySpace. It should be noted that the article did not specify whether or how many of the interviewed faculty members ("lecturers") used these sites to interact with students. Analysis of the interviews conducted with 32 (12 female and 20 male) faculty members from various academic disciplines highlighted several aspects of sharing SNS with students, such as the nature of student-instructor relationship; privacy and self-disclosure; ownership of the SNS space; instructor technological expertise; and regulation of interactions (i.e., code of conduct). The nature of student-instructor relationship was a recurrent theme in many interviews. Many instructors expressed the idea that student-instructor interactions on SNS had the potential to change and challenge the student-instructor relationship. For some instructors, this idea had negative connotations such as concerns for preserving hierarchical

relationships with students. Instructors who enforced such relationships in the classroom felt that informal interactions with students on SNS were incompatible with the type of relationships they established. On the other hand, the instructors who view their offline relationships with students as more democratic and "friendship-based" were supportive of informal interactions with students on SNS and viewed potential for further expanding these relationships. Privacy and disclosure were addressed both as instructor reluctance to share personal information with students and instructor concerns with dealing with information about students. Some instructors shared that their SNS profiles were not consistent with their teaching persona and therefore by connecting with students they perceived a need to censor their usage of SNS. A few participants feared that the SNS interactions would reveal sensitive information about their students (e.g., drug taking, suicidal thoughts) upon which they would feel morally and legally responsible to act. Additionally, instructors expressed concerns related to students' posting of inappropriate comments about their instructors that could lead to defamation or harassment. In connection to this, the need to provide guidance to students "to ensure that they do not use social network sites inappropriately" (Jones, et al., p.215) came up in several interviews, with some instructors feeling that "the university should establish a code of conduct" (p. 215).

In conclusion, several main ideas emerged from the current literature on student-instructor connections via Facebook. First, students' attitudes to interacting with instructors on this site are mixed, with some students seeing potential for increased communication with instructors, while others feeling uncomfortable to connect due to privacy and impression management considerations. Further, mediated and limited interactions with the instructor (e.g., visualizing profiles, looking at pictures) were more acceptable to students than direct textual interactions (e.g., messages, comments). Second, student reactions to instructor's disclosure of

information via the Facebook profile were very interesting from a teaching-learning perspective. Students who learned more about the instructor through Facebook declared increased levels of anticipated motivation, positive classroom climate, and affective learning. Moreover, the more students learned about the instructor, the higher they rated instructor's credibility (caring and trustworthiness), with no significant effect on instructor's perceived competence. Thus, instructors who revealed more information about themselves were more likely to be perceived as caring and trustworthy but not more competent as instructors. Third, there is some tentative evidence showing that being connected with instructors on Facebook correlates with higher GPA. However, it is important to note that causal connections were not tested. Finally, instructors interviewed discussed complex issues such as possible inconsistency between their offline/ class-based relationships with students and online relationships; instructor and student privacy/ disclosure of information; acting upon sensitive information revealed by students and moral and legal accompanying issues.

Course management systems and student-instructor communication

Course management systems (CMS) are online platforms that provide instructors "with a set of tools and a framework that allows the relatively easy creation of online course content and the subsequently teaching and management of that course including various interactions with students taking the course" (Meerts, 2003, p. 1). Typically, CMS include tools that can be categorized as content management tools, which facilitate student access to course content (e.g., course readings, syllabus) (Lonn, Teasley, & Krumm, 2010); and interactive tools, which facilitate student-instructor communication (e.g., announcements, quizzes, chat, discussion boards) and student communication with peers (e.g., group projects, student wiki, blog). The most common CMS in higher education are (although not limited to) Desire2Learn, Blackboard,

WebCT, LearningSpace, and eCollege (Morgan, 2003). While distance education benefits substantially from the integration of tools provided by CMS, there is an increasing trend of integration of CMS into face-to-face courses (Malikowski, 2008). Research shows that CMS are "used three times more often for resident college courses than they are for distance learning courses" (Malikowski, p.81) due to tool integration that allows for the construction of course websites.

In general, in addition to features designed to make more efficient the transfer of course-related information from instructor to students, these systems embed a variety of tools that facilitate communication between instructors and students such as email, chat, asynchronous discussion board, blogs, and wikis. Despite this potential, research has revealed that CMS are underutilized and most often, instructors limit the use of CMS to transmission of information (Malikowski, 2008). For example, Malikowski, Thompson, and Theis (2007) found that from the many tools embedded in CMS instructors use most frequently features that support dissemination of information to students, asynchronous communication, student examination (quizzes and surveys), and file transfer (drop boxes).

Combining longitudinal data on student and instructor perceptions and system use data, Lonn and Teasley (2009) reported similar findings. In their study, tools dedicated to document management (e.g., sharing of course-related material) and one-way instructor communication (e.g., announcements) were intensively used (95% of all user actions) by instructors (n = 1,481) and students (n = 2,281). By contrast, many instructors and students alike rated interactive tools that allows for two-way student-instructor communication as "not valuable" and reported very limited use (5% of all user actions). With a further interest in CMS use for face-to-face course, Malikowski (2008) examined 153 CMS sites (i.e., Desire2Learn) developed by 81 instructors at

a public university, to determine how and for what purposes instructors adopted and combined multiple tools. Adoption of a particular tool was defined as use "at or above the 25th percentile" (Malikowski, p. 83). Findings revealed that instructors used most frequently CMS to make available to students course-related digital materials. This feature was used three times more often than any other CMS tools, which indicates that transmission of information was the underlying framework for incorporating CMS into teaching for these instructors. While the discussion board tool was also used, although less frequently, the study did not indicate whether students used the asynchronous discussion tool to collaborate with peers on assignments or to communicate outside of class with their instructor.

Lonn et al. (2010) explored the attitudes of students and instructors at two colleges (one large residential and one smaller commuter) toward use and perceived value of CMS features. They classified student and instructor uses of CMS into three categories: learner-content interactions (e.g., post/access online readings, post/access multimedia), learner-instructor interactions (e.g., messages and announcements, turn in assignments), and learner-learner interactions (e.g., student group work). In addition to survey data from large samples of students and instructors, for triangulation purposes, Lonn et al. used a large set of system data (1,584 course sites at the residential campus, and 248 sites at the commuter campus) that recorded users' actions with a particular tool. Findings revealed that residential students valued more learner-content interactions, while commuter students appreciated more learner-learner interactions. These results were compatible with the characteristics of the two campuses. Commuter students experienced reduced face-to-face interactions with instructors and peers and therefore they relied more on the interactive features of CMS. On the other hand, residential

students had more opportunity for face-to-face interactions and therefore they did not valued as much as commuter students did the interactive tools.

In conclusion, due to systemic adoption of CMS at many residential universities, CMS are mainstream online teaching and learning resources. However, despite that CMS integrate a variety of tools out of which many that could support student-instructor interactions, students and instructors use CMS for transmission/ reception of course-related information in the majority of cases. Features that support student-instructor communication were used rarely at residential colleges.

Student-instructor communication via instant messaging

While email is a form of asynchronous CMC, instant messaging (IM) affords synchronous, real-time communication between users. Although IM is less used than email in higher education to facilitated student-instructor interaction (Jones & Jonhson-Yale, 2005; Jones et al., 2008), the emerging literature shows that IM is being used by some instructors as a virtual addition to traditional office hours (Balayeva & Hasse, 2009; Hickerson & Giglio, 2009). For example, Hickerson and Giglio (2009) examined the attitudes of undergraduate students (n = 144) who had the option to use IM with their instructors in connection with their first-year communication courses. Analyzing data from multiple sources (questionnaire, logbooks, and IM transcripts) they found that freshman students' preferred channel of communication with instructors was email (64%), followed by IM (23%) and face-to-face interaction (14%). Reports of actual use of different media show that 69% of participants always or frequently used email to contact faculty members, and 19% of students did so via IM, while only 10% of students met instructors during face-to-face interaction. Students who did not have the option of IM relied more on email (71%) than on face-to-face communication (29%). Furthermore, IM was used as a

supplement and not as a replacement of office visits that students continued to use. Similar to Jones and Jonhson-Yale's (2005) findings, this shows that employing CMC for out-of-class interaction can actually increase the amount of overall student-instructor interaction. In addition, students reported that IM had influenced positively their academic performance and increased the quantity and quality of interactions with instructors.

Similarly, Li and Pitts (2009) used a survey design to investigate student use and satisfaction with the virtual office hours offered for students enrolled in five face-to-face classes at a public university. Instructors made themselves available through the IM/chat tool of Facebook once a week for one hour, in addition to traditional office hours. However, their findings revealed an extremely low level of student IM use during virtual office hours. Only three out of 47 students reported having used the synchronous communication with instructors. At the same time, the face-to-face interaction with the instructor was equally infrequent, while most of the student-instructor communication occurred via email and discussion boards. Although the use of IM reported in this study was limited, students who had the option to communicate with the instructor via IM were significantly more satisfied with office hours than students who did not have this option. Li and Pitts concluded that "offering virtual office hours may have a positive impact on students' satisfaction with student-faculty communication outside the classroom" (p. 181).

These studies indicate that students value having as many available channels of communication with instructors as possible, but may not feel comfortable to communicate synchronously with instructors and prefer asynchronous communication tools such as email and discussion boards. Moreover, although synchronous student-instructor interaction can provide valuable real-time feedback for students, it has a major drawback in that it requires students to

participate at the time scheduled by the instructor. In addition, noting that in Li and Pitts' (2009) study, IM was offered only once a week, it can be argued that the convenience and flexibility of IM were not fully reached in this setting. Time flexibility that characterizes asynchronous CMC might be more important to students than the instructor's presence and immediate feedback. What this research does not distinguish is the nature of interactions sought by students when using CMC tools. For example, students seeking interpersonal or social interactions with their instructor may be more willing to use IM than those seeking clarifications regarding course assignments. On the other hand, when there is a need for immediate feedback (e.g., assignments due, forthcoming exams) it can be expected that students would prefer IM to email or discussion boards.

SUMMARY

In the first section of this chapter, I described the theoretical frameworks that guided this study, explaining their role in the research design and conceptualization of findings. The section devoted to face-to-face interactions between students and instructors outside of class included a review of the literature needed to situate this study within the broader higher education literature. In this section, I discussed the role of student-instructor informal interactions outside of class related to student success in college. The empirical findings showed important associations between student-instructor interactions and a range of student outcomes such as academic achievement and satisfaction in college. At the same time, the literature review pointed out limited interactions between students and instructors despite institutional investments. In addition, the review revealed a gap in the literature related to the role of online communication tools in facilitating student-instructor interactions. The third section of this chapter included a review of the interdisciplinary literature focusing on the use of email, Facebook, course

management systems, and instant messaging for student-instructor communication in connection with face-to-face courses. Research in this area, however, is emergent and limited to exploration of student and instructor preferences for specific online tools, frequency of use, and content of communication. There is limited understanding of how student-instructor interactions occur in the online environment, what meanings students and instructors develop while interacting online, and how they negotiate online interactions. This study aims to fill this gap by exploring via a mixed methods design the role of online interactions in student-instructor relationships. In the next chapter, I present the methodological approach employed in this study, describing the pragmatist orientation that I adopted and detailing data collection and analysis for the quantitative and qualitative components of the research design.

CHAPTER 3: METHODS

Employing a mixed methods triangulation design, the purpose of this study was twofold. First, it examined the nature of the association between the frequency and quality of undergraduate students' computer-mediated interactions with instructors and the quality of student-instructor relationship. Second, this study looked into the meanings that undergraduate students and instructors make of their online interactions. Focusing on gaining both a broad and an in-depth understanding of the role of computer-mediated communication (CMC) in the development of student-instructor relationships, this study aimed to answer the following research questions: (1) To what extent do computer-mediated interactions predict the student-instructor relationships, above and beyond the prediction afforded by demographic variables and face-to-face (f2f) interactions? (2) What meaning do students and instructors make of their computer-mediated communication? (3) How do students and instructors negotiate relationships using CMC tools (i.e., email, Blackboard, Facebook, and IM)? and (4) What similarities and differences exist between the meanings that students attribute to the online interactions and the meanings that professors make of these interactions?

In this chapter, I first present an overview of the pragmatist orientation that guided the research design. Next, I detail the research approach employed in this study emphasizing data collection and data analysis.

PARADIGMATIC ORIENTATION

In this study, I employed a mixed methods design (Tashakkori & Teddlie, 1998; Creswell & Plano Clark, 2007) approached from a pragmatist orientation, which is a philosophical paradigm that underlies many mixed methods designs (Tashakkori & Teddlie, 1998; Teddlie &

Tashakkori, 2003; Creswell & Plano Clark, 2007). The pragmatist paradigm, introduced in the social sciences research in the 1990s, refutes the incompatibility thesis and proposes that "quantitative and qualitative methods are compatible" and therefore can be employed in the same study (Teddlie & Tashakkori, 2003, p. 7).

Pragmatist researchers orient themselves toward "what works" (Creswell & Plano Clark, p. 23) and favor the centrality of the research questions over methods and philosophical stances, "addressing their research questions with any methodological tool available" (Tashakkori & Teddlie, 1998, p. 21). According to Tashakkori and Teddlie, mixed methods research aligns best with pragmatism, which allows the researcher to "study what interests and is of value to [her], study it in the different ways that [she deems] appropriate, and use the results in ways that can bring about positive consequences within [her] value system" (p. 30). Adopting a pragmatist stance for this study, I positioned myself along an epistemological continuum that integrates different degrees of subjectivity and objectivity (Tashakkori & Teddlie). At the axiological level, I acknowledge that research is value-laden and therefore any research decision is subsumed to the researcher's "personal value system" (Tashakkori & Teddlie, p.26). Holding on this perspective, I expose next my beliefs and assumptions that are derived from my personal and professional experiences.

Reflexivity statement

My personal motivation for pursuing this topic developed from a growing interest and fascination with the ability of some online tools to enable relationships in general, and professional, school-based relationships in particular. As an avid user of communication technology such as audio-video chat, email, social networking sites, I hold clear assumptions about what technology can facilitate and hinder. Generally, I am a relatively early adopter of

technology and I approach new technological developments with positive attitudes and believe that technology does more good than harm for society in general. I believe that communication technology, in general, brings people together by diluting space boundaries and creating opportunities for more frequent interactions. In my ten years of elementary school teaching, I have always been passionate about infusing computer applications and CMC into teaching and learning. My enthusiasm developed while participating with my students in online international collaborative projects together with other teachers and students from around the world. While doing that, I experienced the capability of CMC tools to enhance student learning as well as circumstances in which these tools can hinder communication. At the same time, I acknowledge that technology has no absolute value in itself and that users are the ones to shape its potential by the way in which they appropriate the technology to meet their own goals.

Certainly, these beliefs and experiences have shaped my approach to designing this study and continued to shape my understanding of the research problem throughout the data analysis and interpretations of findings. Having acknowledged this, in the next section I delineate the research design employed in this study.

MIXED METHODS DESIGN

With the purpose of exploring the role of CMC in the relationships between students and instructors at the college level, I conducted a mixed methods research that combines quantitative and qualitative components (Creswell & Plano Clark, 2007; Tashakkori & Teddlie, 1998). Defined as a research design that "focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or a series of studies" (Creswell & Plano Clark, p.5), mixed methods assume that the integration of both approaches creates opportunity for greater understanding of the research problem (Creswell & Plano Clark). The key strength of mixed

methods research is that "it enables the researcher to simultaneously answer confirmatory and exploratory questions, and therefore verify and generate theory in the same study" (Teddlie & Tashakkori, 2003, p. 15).

Creswell and Plano-Clark (2007) identified four main categories of mixed methods designs: triangulation, embedded, explanatory, and exploratory, each design having its own specific variants or models. The triangulation design is "the most common and well-known approach to mixing methods" (Creswell and Plano-Clark, p. 62). Generally, this type of design is employed when a researcher chooses to "implement the quantitative and qualitative methods during the same timeframe and with equal weight" (p.63-64). The triangulation design can be applied via four models, which are the convergence model, the data transformation model, the validating quantitative data model, and the multilevel model (Creswell and Plano-Clark).

The design framework of this study is a "**multilevel model**" within a "**triangulation design**" (Creswell & Plano Clark, 2007, p.62; 65). Introduced to the social science research in 1978 by Denzin, the term "triangulation" designates the use of multiple sources to inform conclusions and inferences on social phenomena (Teddlie & Tashakkori, 2003). The triangulation design capitalizes on the integration of complementary qualitative and quantitative data with the purpose of a more comprehensive understanding of the research problem (Creswell & Plano Clark, 2007). In this approach, the researcher collects quantitative and qualitative data in the same timeframe and initially analyzes separately each dataset using techniques prevalent in each traditional approach. Finally, the goal is to derive final interpretations based on the comparison of quantitative and qualitative findings, or validation or extension of quantitative results with qualitative data (Creswell & Plano Clark). Specific to multilevel triangulation is that different types of data are collected across "different levels within a system" and "the findings

from each level are merged together into one overall interpretation" (Creswell & Plano Clark, p.65). In this study, I applied a multilevel model by collecting quantitative data from a larger sample of undergraduate students (level1), qualitative data from a smaller sample of undergraduate students (level 2), and qualitative data from a sample of professors (level 3). In this way, the final interpretations of data incorporate multilevel perspectives of students and professors. Figure 3.1 displays the visual diagram of the multilevel triangulation model employed in this study (diagram created for this study by modifying/ reorganizing a figure presented in Creswell & Plano Clark, 2007).

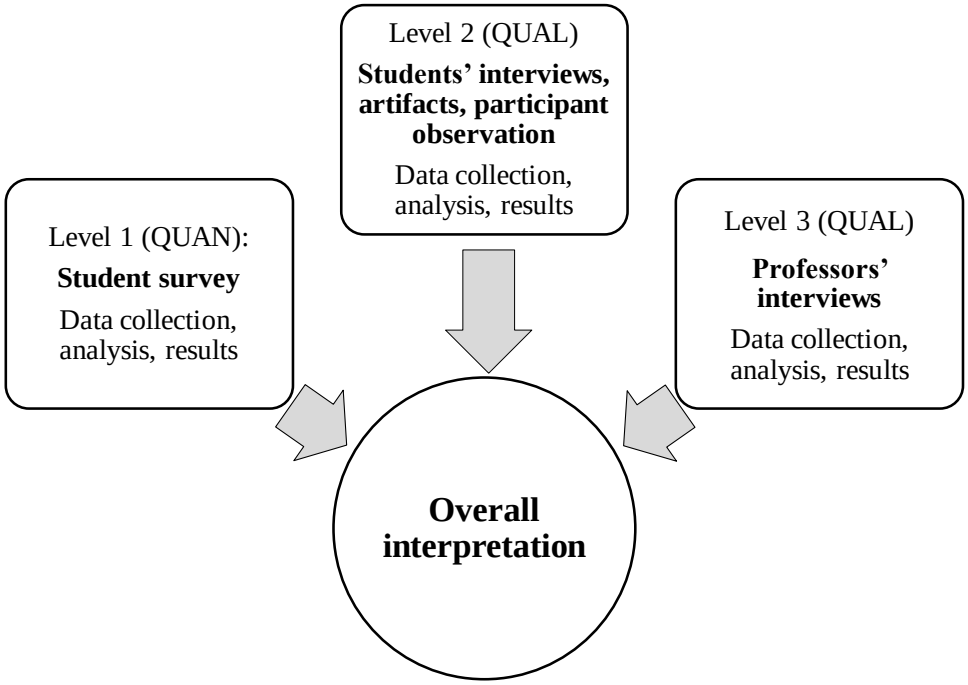

Figure 3.1. Triangulation Design: Multilevel Model

In this multilevel approach, data collection and analysis took place concurrently, with the administration of survey, interviews with students and professors, and artifact collection conducted in parallel. Concurrent timing is a common feature of the triangulation designs (Creswell & Plano Clark, 2007). Separate analyses were performed on qualitative and quantitative data. In the final stages, interpretations were derived based on both quantitative and

qualitative findings. Since both quantitative and qualitative components of this design contributed concurrently to addressing the purpose of this research, I used the "QUAN+QUAL" notation to identify this mixed methods design. This abbreviation expresses that "both quantitative and qualitative methods [are] used at the same time during the research, and both have equal emphasis in the study" (Creswell & Plano Clark, 2007, p.41).

Rationale for employing a mixed methods design

The quantitative data collection relied on a cross-sectional web-based survey. In this phase, I collected data from a larger sample of undergraduate students (n = 320) regarding their perceptions of student-instructor relationships and computer-mediated communication with instructors. Concurrently, I collected qualitative data for an in-depth examination of the role of CMC in student-instructor relationships. Qualitative data obtained from multiple sources (interviews with undergraduate students and professors, participant observation of Facebook activity, artifacts of email and Facebook communication) were meant to expand the understanding of statistical results (which are limited to one source, the cross-sectional survey). Moreover, qualitative data provided additional information about the norms and practices that students and instructors negotiate in connection to their computer-mediated communication. Although a survey is useful for obtaining extensive, systematic, and comparable information on the perceptions of a large sample of students in a timely manner, a survey alone cannot provide in-depth, detailed information about the dynamics of student-instructor interactions via CMC tools. Qualitative data collection and analysis supplement the statistical findings with rich information about *how* CMC is used to foster student-instructor relationships. By tapping into the strengths of qualitative methods (e.g., providing detailed, rich information from fewer

participants), this study presents professors' perspectives in addition to students' views, for a more comprehensive picture of student-instructor interactions via CMC.

QUANTITATIVE DESIGN

In the quantitative section of this study, a survey was employed with the purpose of collecting data on undergraduate students' perceptions of online interactions with instructors. The survey targeted a sample of undergraduate students at the research site.

Participants

Survey respondents were undergraduate students (n = 320) enrolled at a research university in the Southeast of the United States during the 2010-2011 academic year. Out of 320 respondents, 247 were female students (77%) and 73 were male students (23%) (see Table 3.1 Descriptive statistics). Compared with the gender distribution of the overall undergraduate student population at this university (49% women and 51% men) (OIRA, 2010), the gender distribution of this sample was different. The respondents' ages ranged from 18 to 46 years (M = 21, SD = 2.9), with 87% of respondents being 22 or younger. First-year students represented 26% of the sample, sophomores represented 4%, juniors represented 19%, and seniors represented 51% of the sample. Eleven respondents (3%) in this sample were Hispanic or Latino. The racial distribution showed that seven students (2%) were Asian, 19 students (6%) were Black, one student was Native Hawaiian (or other Pacific Islander), and 282 students (88%) were White. Eleven students (3%) chose the multiracial category. In terms of students' majors, the sample was very diverse, including students pursuing Bachelor's degrees in more than 60 different program areas (majors). Some of the best-represented majors were Psychology (16%), History (7%), English (6%), and Public Relations (4%). Over 70% of the respondents reported a GPA of 3.00 or higher.

Table 3.1

Descriptive statistics

	Number	Percent
Gender		
Female	247	77.2%
Male	73	22.8%
Ethnicity		
Hispanic/ Latino	11	3.4%
Not Hispanic/ Latino	309	96.6%
Race		
American Indian or Alaska Native	0	0%
Asian	7	2.2%
Black or African American	19	5.9%
Native Hawaiian or Other Pacific Islander	1	0.3%
White	282	88.1%
Multiracial	11	3.4%
Year of study		
First-year	84	26.3%
Sophomore	12	3.8%
Junior	91	19.1%
Senior	163	50.9%

Procedure and response rate

The survey was administered online at the beginning of the Spring 2011 academic semester, between January 24, 2011 and February 15, 2011, using the SPSS *mrInterview* software. Participants were solicited from eight different courses offered in Spring 2011 at this university. An email inviting students to complete the online survey and containing the survey link was sent to several instructors at the research site who forwarded the invitation to all

students in their undergraduate classes. Responses were anonymous; the survey did not create any links between the participants' email address and their survey responses. Two reminders were emailed to students via their instructors five days apart following the original email. Nine instructors from six different departments at the research site provided assistance with the survey data collection (see Table 3.2. Distribution of the targeted students by instructor, class, and department). These instructors were selected based on several criteria and in connection with their professional relationship with the researcher. The main criteria for selection were: (1) the instructor was teaching undergraduate classes in Spring 2011; (2) the classes taught by each instructor contributed to a balanced distribution of students in the targeted sample based on class level (i.e., freshman, sophomore, junior, senior); (3) variability based on the instructor's department was sought. The survey reached a total number of 727 students and yielded a response rate of 52% successful returns and 61% total returns.

The respondents had the option to enter their names into a drawing for one of two $50 gift certificates to a national retailer. No course credit was offered for participation. To preserve anonymity, no connection between respondents' answers and the names and email addresses they provided for the drawing was possible. At the end of the survey, a link to a separate database was provided for the drawing registration. The drawing took place approximately a week following the second reminder email.

Table 3.2

Distribution of the targeted students during by instructor, class, and department[2]

Instructor	Department	Number of targeted students	Approximate class size	Class level
Instructor 1	Economics	36	30	300-level
Instructors 2, 3, 4, 5	Educational Psychology and Counseling	165	20	400-level
Instructor 6	English	103	30	100-level & 200-level
Instructor 7	History	123	40	300-level & 400-level
Instructor 8	Leadership Development	100	20	100-level
Instructor 9	Management	200	200	300-level

Data collection - Instrument and variables

The survey instrument incorporated several subscales used in previously published studies (see Appendix C for the survey instrument). In addition, some items were developed for the purpose of this research.

Student-Instructor Relationship Scale. Student perceptions of the quality of their relationship with instructors were assessed using the Student-Instructor Relationship Scale (SIRS) (Creasey, Jarvis & Knapcik, 2009; Creasey, Jarvis & Gadke, 2009). This previously validated 19-item instrument relied on the theoretical assumption that "there are central relationship qualities that are deemed significant across most relationships. For instance, feelings of connectedness or closeness as well as relationship anxiety are fundamental relationship provisions that appear to transcend important or close relationships with teachers, friends, romantic partners, and parents" (Creasey, Jarvis & Knapcik, 2009, p. 2). Therefore, this

[2] Due to the survey's anonymity, the number of respondents in each targeted class could not be determined.

instrument measures student relationships with instructors on two dimensions: connectedness and anxiety (see Appendix D). The *Instructor Connectedness* dimension contains eleven items that estimate how close and connected a student feels to a particular instructor. Higher scores denote "stronger feelings of connectedness" while lower scores reflect "avoidance or a tendency to eschew a close relationship with the instructor" (Creasey, Jarvis & Gadke, 2009, p. 359). Previous internal consistency estimates of reliability showed excellent reliability for this subscale scale (α = .92) (Creasey, Jarvis & Gadke, 2009). The *Instructor Anxiety* dimension consists of eight items that measures student perceptions of the instructor's acceptance. Higher scores represent increased anxiety in relationship with the instructor and lower scores reflect less negative perceptions. Good to excellent reliability (α = .87) was previously reported for this subscale (Creasey, Jarvis & Gadke, 2009). The two subscales were negatively correlated (r = -.31). The Likert-type answering scale requests students to think about a particular instructor when expressing agreement/disagreement with the statements on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Test-retest reliability analyses over a three-four week period showed adequate consistency (Creasey, Jarvis & Knapcik, 2009). Previous research found that feelings of connectedness to the instructor measured with this instrument correlated positively with instructor's verbal immediacy, and feelings of anxiety within student-instructor relationship correlated negatively with instructor's nonverbal immediacy (Creasey, Jarvis & Gadke).

However, because the authors recommended further psychometric investigation for this instrument, validity and reliability testing of this instrument was part of the analysis in this study. Factor analysis was employed to verify the instrument's dimensionality and coefficients of internal consistency were calculated for this sample (findings are presented in Chapter 4).

The frequency of student-instructor face-to-face and computer-mediated interactions was assessed in this study via a matrix of eleven items. Given that no previous instrument was identified to measure CMC interactions between students and instructors, these items were developed for the purpose of this study starting with a section ("benchmark") of the National Survey of Student Engagement instrument (NSSE, n.d.), which has been used to assess face-to-face student-faculty interactions (SFI). The NSSE (2010) SFI benchmark includes six items that focused on specific content areas or topics of interaction between students and instructors. These areas are (1) grades and assignments; (2) career plans; (3) ideas from readings or classes; (4) feedback on academic performance; (5) school-related activities other than course work; and (6) research projects. These content areas were included in the items developed for this study. In addition, based on the review of literature and the review of other national surveys on student college experience (e.g., CSEQ-College Students Experience Questionnaire), several other areas of student-instructor interactions were added in an attempt to assess comprehensively the areas of potential student-instructor interactions. Such additional areas were (1) exams; (2) advice on how to improve understanding of the course material or writing; (3) course selection and academic program; (4) personal problems and concerns; and (5) informal socializing (See Appendix E for the full list of student-instructor interaction items). Finally, the eleven items mentioned above were used to measure the frequency of student-instructor interactions for four CMC tools (email, Blackboard, Facebook, and instant messaging), as well as for the face-to-face interactions. The frequency of interactions was measured on a 4-point scale (*never*; *sometimes* – 1-3 times per semester; *often* – 4-10 times per semester; and *very often* – more than 10 times per semester).

For validation purposes, these eleven items were subjected to factor analysis. In addition to providing validity tests for scales (i.e., sets of items) which measure specific constructs, factor analysis has "considerable utility in reducing numerous variables [i.e., items] down to a few factors" (Tabachnick & Fidell, 2007, p. 608), which can then be used to compute factor scores for further analyses. The advantage of this technique consists in the parsimony of its results (Tabachnick & Fidell, 2007). For example, in this study, the eleven student-instructor interaction variables were factor analyzed and reduced to two factors whose scores were subsequently used to predict the student-instructor relationship.

Student satisfaction with face-to-face and CMC interactions. In addition to the quantity (frequency) of out-of-class interactions, a qualitative component of these interactions (student satisfaction) was considered based on Pascarella's (1980) recommendation. A one-item measure with a 4-point scale (*poor, fair, good, excellent*) was created to evaluate the student satisfaction of interactions for each CMC tool of interest, as well as for the face-to-face interactions.

Finally, **demographic information** including age, gender, year of study, major, self-reported GPA, Internet usage, course load, and experience with each category of technology was collected.

Data analysis

In the triangulation mixed methods design, data analysis takes place at two stages: (1) a separate analysis of the qualitative and quantitative data; and (2) an integrative analysis of qualitative and quantitative findings. Based on the integration of findings, the researcher is able to answer the research question associated with the selected mixed methods model (Creswell & Plano Clark, 2007), in this case, "What similarities and differences exist between the meanings

that students attribute to the CMC interactions and the meanings that professors make of these interactions?"

To address the first research question (Do computer-mediated interactions predict the quality of student-instructor relationships, when other variables are taken into account?), I performed a series of hierarchical (sequential) regression analyses (Tabachnick & Fidell, 2007) using the SPSS package (PASW Statistics 18). In addition, confirmatory factor analyses were performed to check the validity of the subscale used to measure students' perceptions of the student-instructor relationship and the validity of the subscale used to measure the frequency of student-instructor interactions. Internal consistency estimates of reliability (Cronbach's alpha) were calculated for these scales. Results of these analyses are presented in Chapter 4.

QUALITATIVE DESIGN

Seeking to examine how students and instructor make meaning of their computer-mediated interactions and what social norms and practices develop in connection to each type of CMC, I conducted multilevel qualitative data collection: interviews with undergraduate students, interviews with professors, participant observations of student-instructor interactions on Facebook, and artifacts of student- instructor interaction via email.

Participants

Within the qualitative component, the participants were six undergraduate students and six professors (tenured or on tenure-track) at a large public research university in the Southeast of the United States. All participant identifiers used in this paper are pseudonyms self-selected by participants.

In the student sample, one of the participants was first-year (freshman), two were sophomores, one was junior, and two were seniors. The participants were studying toward

Bachelor's degrees in six different majors. Four of the participants were women and two were men. Their age ranged from 18 to 28 years. Two students were Asian and four were White/Caucasian (see Table 3.3 Description of the participating students).

Table 3.3

Description of the participating students

Student pseudonym	Major	Year in college	Age	Race	Gender	Length of interview (minutes)
Cleopatra	Biology	Freshman	18	White	Female	27
Cory	Electrical Engineering & Math	Senior	21	Asian	Male	39
Julia	Spanish and Hispanic Studies	Sophomore	19	White	Female	46
Lauren	English literature	Junior	20	White	Female	35
Melanie	Economics	Senior	28	White	Female	37
Steve	Accounting	Sophomore	19	Asian	Male	34

The professors' sample included six participants out of which three were professors, one associate professor, and two assistant professors, from six different departments. Two of the professors were women and four were men, with ages between 33 and 68 years. All professors in this sample were White/Caucasian (see Table 3.4 Description of the participating professors).

Table 3.4

Description of the participating professors

Professor Pseudonym	Department	Academic Rank	Teaching years	Age	Race	Gender	Length of Interview (minutes)
Alex	Mathematics	Assistant Professor	7	33	White	Male	41
Betty	Nursing	Associate Professor	14	45	White	Female	43
Halley	Anthropology	Assistant Professor	6	37	White	Female	33
J Wach	Finance	Professor	30+	64	White	Male	41
Logan	Biochemistry and Cellular & Molecular Biology	Professor	28	66	White	Male	68
Orfeo	Ecology & Evolutionary Biology	Professor	30+	68	White	Male	50

Students in three different undergraduate classes were invited by their instructors via email to participate in interviews and artifact collection. Eight students declared their interest, out of which six were selected for participation. Participant selection was guided by the need to identify informants who have experienced the phenomenon of interest and could potentially share rich information about it (Hatch, 2002). These participants were selected purposefully (Merriam, 1998) based on several criteria. The criteria for student participant selection were: (1) participants were undergraduate student during 2010-2011 academic year; (2) they have used email, Blackboard, Facebook and/or IM (or at least two of these) to interact with instructors; (3) they had experience with using Facebook. Moreover, participant selection has given priority to those students who have interacted on Facebook with instructors from the university. All except two of the student participants met this final criterion. However, the rationale for including these two students was to provide sample variation (Hatch, 2002) and insights into the non-user perspective. A $20 gift certificate was offered to each student participant at the end of the interview.

Similarly, the selection of the participating professors relied on criterion sampling strategy (Hatch, 2002) and was guided by several criteria: (1) the professors has taught undergraduate courses in the current academic year; (2) they have had experience with interacting with students via email, Blackboard, Facebook, and/or instant messaging; (3) they have had a Facebook account and experience with using Facebook. Additionally, the sampling strategy took into consideration the professors' departmental affiliation in order to ensure the maximum variation of the sample (Hatch, 2002).

With these criteria in mind, approximately forty instructors, who have worked in the past with the Office of Innovative Technology Consulting, were considered. These instructors had a

declared interest in implementing technology into their teaching and were perceived as active users of CMC with their students. In addition, instructors who I personally knew and who met these criteria were invited to participate. After a pre-selection involving the criteria described above, an invitation for participation was sent through email to eight professors, out of which six accepted to participate.

Data collection

Interviews

Qualitative data collection relied primarily on interviews. I conducted individual in-depth interviews with six students and six professors, with the intention of bringing into the conversation "the meaning structures that participants use to organize their experiences and make sense of their worlds" (Hatch, 2002). The interviews took place between December 20, 2010 and February 5, 2011, with the majority of them conducted in January 2011, at the beginning of the academic semester. Each interview started with an open-ended question "Tell me about your interactions with professors/undergraduate students outside of class" and covered nine open-ended questions, addressed to the interviewees in no pre-established order (see Table 3.5 Semi-structured interview protocols). The order of the subsequent questions was guided in each interview by what the interviewee shared. The questions addressed in the student interviews mirrored the questions addressed to the participating professors. In addition to the pre-determined questions, several questions not specified in advance were asked when necessary, with the purpose of clarifying or summarizing the participants' responses.

Table 3.5

Semi-structured interview protocols

Faculty Interview Protocol	Student Interview Protocol
1. Tell me about your interactions with students outside of the class.	Tell me about your interactions with professors outside of the class.
2. Tell me more about your communication with students using online tools.	Tell me more about your communication with professors using online tools.
3. How do you decide how to communicate with your students?	How do you decide how to communicate with your professors?
4. Describe an online exchange you had with a student, which stands out to you.	Describe an online exchange you had with a professor, which stands out to you.
5. Tell me about a time that online communication helped you reach out to a student.	Tell me about a time that online communication helped you reach out to a professor.
6. Tell me about a time that a student has reached out to you using online communication.	Tell me about a time that a professor has reached out to you using online communication.
7. Tell me about a time when online tools hindered your communication with a student.	Tell me about a time when online tools hindered your communication with a professor.
8. What it is like when you interact with students on Facebook?	What it is like when you interact with professors on Facebook?
9. Which students (what type of students) do you interact with the most online?	In terms of faculty members, who do you interact with the most online?

The duration of the student interviews ranged from 27 to 46 minutes, with a total time of 219 minutes. The interviews with professors ranged from 33 to 68 minutes, with a total time of 276 minutes. All of the student interviews took place in the university's library, in rooms available for group study. The professor interviews took place in the participant's office. To ensure accuracy, I audiotaped and transcribed the interviews for analysis.

Artifacts and participants observation of Facebook activity

Additional sources of qualitative data were artifacts (emails) and observation notes of the Facebook activity. These data were collected from the consenting interviewed students and were used in combination with interview data for validation and triangulation purposes (Hatch, 2002;

Creswell & Plano-Clark, 2007). Artifacts consisted of email messages between participating students and their instructors in the current or previous semesters. Thirty-nine (39) individual email messages were collected from four students. Two of the participants chose not to provide email artifacts.

To understand further the student- instructor interactions on Facebook, I employed participant observation of the Facebook activity. Three of the interviewed students who had interacted with instructors on Facebook agreed to allow me access to their Facebook page by accepting my friendship request, with the purpose of observing their Facebook interaction with instructors[3]. During one month (starting with February 5, 2011), I conducted daily observations of the participant's Facebook wall in search for interactions between the participant and her/his instructor Facebook friend(s). These observations resulted in notes that were analyzed in connection to other qualitative data. For the purpose of this data collection, I used my personal Facebook account to connect with participants. The rationale for not creating a new account for the purpose of this research was to reciprocate the trust that the participants shared by allowing access to their personal information. I believe that it would have been unethical to ask them to reveal private (and potentially sensitive) information without being willing to do the same myself.

Data analysis

To analyze the qualitative data, I employed the constant comparative method (Glaser & Strauss, 1967; Strauss & Corbin, 1998), which is an inductive approach used for generating "categories, properties and hypotheses about general problems" (Glaser & Strauss, 1967, p.104).

[3] Facebook users can manage their privacy by using the privacy settings to control with whom they share each type of information on their profile. Currently, these settings circumscribe three categories: "friends only", "friends of friends", and "everyone". When one's privacy settings are set to "friends only" or "friends of friends", users from outside of these groups cannot visualize the restricted content. By becoming friend with the participants, I was able to visualize their profiles.

The analysis focused on combining different data sources to provide a detailed description of the ways in which students and instructors interact via each category of CMC. To manage the analysis of interviews, observations, and artifacts I used the qualitative analysis software ATLAS.ti 6.

Following Glaser and Strauss (1967), the process of thematic data analysis included four phases. (1) At the first iteration, after listening to the audio files and reading and re-reading of the transcripts, the analysis started with the open coding of the interview transcripts. While doing this, I attended to salient text units and patterns in the data, creating and assigning codes for each salient unit or identifying in-vivo codes. The comparison came into play as the new incidents to be coded were compared to the previous occurrences. Based on comparison of open codes, I formulated the categories of codes and I derived subcategories as properties of the categories. Within the process, converging patterns as well as conflicting ideas were recorded as memos for further reflection. (2) The second step, "integrating categories and their properties," consisted in refining the codes (merging, eliminating, re-labeling codes) and finding relationship between categories (Glaser and Strauss, 1967, p. 109). (3) At a new iteration, I identified fewer and fewer new properties seeking to refine the categories. By the end of the process, the new incidents provided just clarifications and, most importantly, reductions of the categories and subcategories, which enabled generalizations (Glaser and Strauss). At the point of saturation, each new incident fitted in the previous categories and new codes were not needed. (4) In the final step, I refined further the categories by reading and re-reading the assigned quotations for each category. Based on the research questions, I combined the categories into themes, which are presented in Chapter 5 as "meanings of student-instructor interactions" and "practices" and "expectations" for interactions.

ETHICAL CONSIDERATIONS

Along the process of implementing this research design, I dealt with several ethical issues. First, during data collection via survey, I worked to ensure participants' anonymity by designing a web-based survey that did not require respondents to identify themselves. In order to provide incentives for participation, a drawing for a gift card was held, which required that participants revealed their names and email addresses. However, anonymity of survey responses was preserved by providing a separate link for respondents to enter their names into a separate database, disconnected from their survey responses.

The qualitative data collection, which capitalizes on direct interaction between the researcher and participants, had the potential to create additional confidentiality issues. I worked to preserve interviewees' confidentiality by using pseudonyms to identify participants in the interview transcripts and by storing securely the original audio files.

Participant observation of the Facebook student-instructor interactions and artifact collection were the most sensitive aspects of data collection. Requesting the participating students to add me as their Facebook friend and observing their interactions with instructors implied that I had access to their entire Facebook activity and therefore to their interactions with other people. To handle these issues, I explicitly informed participants that Facebook data collection would not involve any artifact collection (e.g., screen shots of Facebook profiles, printings of their account pages). My direct observations of Facebook interactions with instructors, which took place during a one-month period, resulted in observation notes to be analyzed.

VALIDATION AND EVALUATION OF THE STUDY

Quantitative. In an effort to provide results that are both valid and reliable, I conducted the statistical analyses according to the standards established in the literature. First, I verified that the dataset contains enough variability by performing descriptive statistics. Second, prior to performing any analysis I dealt with missing cases and outliers by eliminating outliers and incomplete cases. Third, I made sure that statistical inferences were based on data collected with a valid and reliable instrument. To address the validity of the survey, I conducted factor analysis using SPSS (PASW Statistics 18). In addition, I calculated internal consistency estimates of reliability separately for each dimension of the survey. Finally, prior to conducting the statistical analyses, I verified whether the main assumptions underlying each type of statistical analysis performed were in place. For example, before performing factor analysis, I computed the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO), to check for the presence of multicollinearity (Hinton, Brownlow, McMurray, & Cozens, 2004). In addition, I used the Bartlett's test of sphericity to verify whether the correlation matrix is an identity matrix. These two tests provided information that factor analysis was appropriate for this dataset. In addition, prior to performing regression analysis, I run a Levene's test to check for the assumption of homogeneity of variance (Tabachnick & Fidell, 2007).

Qualitative. In addition to following standards of reliability and validity required by the statistical procedures, I addressed issues of authenticity and trustworthiness of my qualitative analysis. First, the triangulation of multiple sources of data was inherently built in this mixed methods design. Thus, within the qualitative analysis, I blended qualitative data collected via multiple methods (i.e., interview, artifact collection, and participant observation). While the central source of qualitative data were the interviews, when possible, as Tashakkori and Teddlie

(1998) recommended, I checked the participants' accounts against information provided by artifacts of their email communication and observation field notes of the Facebook communication. At the same time, the mixed methods approach purposefully employed multilevel triangulation in the attempt of answering the mixed methods research question (What similarities and differences exist between the meanings that students attribute to the CMC interactions and the meanings that professors make of these interactions?). Therefore, following Creswell and Plano Clark's (2007) suggestion, I compared and contrasted data across three levels of analysis (student survey data, student multi-source qualitative data, and professor interview data).

Second, I provided support for my interpretations of the qualitative data by quoting the participants' words throughout the findings section. The thick description of the phenomenon and its context, together with relevant interview excerpts provided in Chapter 5, allows the audience to understand the delimitations and characteristics of the phenomenon of student-instructor online interactions and to evaluate the plausibility of my interpretations.

Finally, I employed member checking as a strategy to verify the trustworthiness of my findings (Creswell, 2007). During May 10 - May30, 2011, I contacted each interview participant (professors and students) via email to seek feedback on my findings. By sharing an abbreviated presentation of my qualitative findings (meanings of online interactions, and expectations and practices), I sought answers to two questions:

(1) Is there anything in the presentation of findings that was completely against the participants' understandings of online interactions with undergraduate students? and

(2) Have I failed to account for something that was very important to participants regarding these interactions?

In addition, I invited the participants to comment on my findings in whichever way they considered appropriate. Three students (Cleopatra, Cory, and Steve) and three professors (Betty, JWach, and Logan) responded via email. Their responses were supportive of the findings presented in Chapter 5. Professor Betty's initial comments showed that the findings regarding Facebook practices did not fully reflect her approach to using Facebook with undergraduate students. Therefore, I engaged Betty in a series of email messages that helped me understand better her position. I concluded that while Betty's view was not misrepresented, the findings presented in Chapter 5 reflect more the understandings of those students and instructors who used Facebook to interact with students. The views of those professors who did not interact with students on Facebook or who used only Facebook group pages to interact (Betty was one of these professors) were represented in the section describing the meanings of Facebook interactions, whenever appropriate (e.g., privacy concerns). In addition, their views informed the findings describing interactions via email and Blackboard. At the same time, some of the Facebook practices and expectations described in Chapter 5 were not relevant to all participating professors.

SUMMARY

In this chapter, I delineated the methodological approach of this study. I started by outlining the main features of pragmatism, which is the underlying philosophical orientation of this study. Next, I showed how mixed methods research could be conducted from a pragmatist stance and I provided an overview of the main types of mixed methods designs, explaining how a multilevel model triangulation design is applied in this study to answer the research questions highlighted in the first chapter. Then, I described in detail the data sources, the participants and participant selection, the data collection strategies, and the process of data analysis, separately

for each design segment, qualitative and quantitative. Next, I discussed the ethical implications of data collection, explaining how I worked to gain and maintain the participants' trust and to preserve their anonymity in the process. Finally, I highlighted the standards of quality that guided the process of data analysis and reporting of findings. In the next chapter, I present the results of quantitative analysis.

CHAPTER 4: RESULTS OF QUANTITATIVE DATA ANALYSIS

This chapter presents the findings of the quantitative analysis, addressing the research question: Do computer-mediated interactions predict student-faculty relationships, above and beyond the prediction afforded by demographic variables and face-to-face (f2f) interactions? First, the procedures of data screening for accuracy and handling missing data are reported, followed by descriptive statistics. Factor analyses and reliability analyses for the Student-Instructor Relationship Scale and the Frequency of Student-Instructor Interactions items are presented next. Finally, the results of hierarchical multiple regressions are reported.

MISSING DATA AND OUTLIERS

Prior to data analysis, data were screened for accuracy of data entry, missing values, and outliers (Tabachnick & Fidell, 2007). In the initial sample of 374 cases, 14 cases were identified as graduate and post baccalaureate students and were deleted because the population of interest for this study consisted of undergraduate students. In the remaining sample of 360, there were 40 cases of randomly missing values on some of the variables of interest, due to survey system timeout or shutdown. Given that the missing data did not exceed 5% of the cases on any given variable, the deletion of cases was considered reasonable (Tabachnick & Fidell). The remaining 320 observations were inspected for univariate and multivariate outliers. One case with an extremely low score on age (11 years old) was identified as outlier. Examination of scores on other variables showed that this score was an input error and the age was modified to 21 given that the response on “year of study” was “senior” and most of the respondents who were seniors reported an age of 21. The final sample size used for data analysis consisted of 320 cases.

DESCRIPTIVE STATISTICS

Frequency of out-of-class interactions

One of the goals of this survey study was to identify how often students and instructors interact outside of the boundaries of a class using computer-mediated communication (CMC) tools (i.e., email, Blackboard, Facebook, and instant messaging/IM). For comparison and control purposes, the survey measured the frequency of f2f interactions, as well. Given that students were prompted to think about an instructor with whom they have interacted the most outside of class, the low means of interactions revealed by descriptive statistics are surprising. On a scale from 1 (never) to 4 (very often), the highest mean was 2.38 (SD = .84), with all but two means being lower than 2. This suggests that, on average, most of these students never interacted or interacted rarely (sometimes: 1-3 times per semester) with their instructor either f2f or using one of the CMC tools. Further, most student-instructor interactions took place f2f (e.g., during office hours, before or after class, in the hallways) for every given topic of interaction. When the interaction took place online, most students used email (97%), followed by Blackboard (52%), Facebook (5%), and IM (1%).

The survey employed in this study included eleven topics of interactions between student and instructors, same for each medium (Details about the selection of topics are presented in Chapter 3). Table 4.1 and Figure 4.1 display the mean frequencies of interactions for each topic by medium of interaction (f2f and CMC tools). When meeting **face-to-face** with the instructor, students communicated most frequently about exams and assignments (M = 2.38, SD = .84) and least frequently about personal problems or concerns (M = 1.44, SD = .72) and with the purpose of informal socializing (M = 1.44, SD = .76). When responses on “sometimes”, “often” and “very often” were collapsed, results showed that 86% of students communicated f2f with the

instructor at least one time during the semester about exams and assignments and 71% of students communicated f2f about grades (see Table 4.2 for percentages on each topic of interaction). In addition, 67% of students discussed f2f with the instructor about their academic performance, 63% about ideas from readings or class, and 50% about career plans (e.g., recommendation letters, graduate schools, jobs). In general, student use of **email** mirrored the pattern of f2f interaction (see Figure 4.1). The most frequent content of email interactions dealt with exams and assignments (M = 2.35, SD = .77) and the least frequent content was informal socializing (M = 1.23, SD = .55). Aggregated responses showed that 89% of respondents used email at least once to communicate with the instructor about exams and assignments. In addition almost two thirds of students (65%) communicated via email about grades, more than half (55%) received feedback on academic performance, and 54% received advice about improving their understanding of the course material and/or writing via email (see Table 4.2 for other percentages). On **Blackboard**, students communicated with the instructor the most about exams and assignments (M = 1.74, SD = .97) and interacted the least to socialize informally (M = 1.04, SD = .26). Aggregate percentages showed that less than half of students (44%) used Blackboard to communicate with instructors about exams and assignments and only about a third of students (36%) communicated on Blackboard about grades. One fourth of students (25%) interacted about ideas from readings or classes, and received feedback about academic performance via Blackboard. When students used **Facebook** for interaction, informal socializing with the instructor (e.g., hobbies, greetings, birthday wishes) was the most common topic of interaction (M = 1.06, SD = .33). Students almost never used Facebook (M = 1.01) to communicate with instructors about ideas from readings or classes; feedback on academic performance; course selection or academic programs; grades; and research projects. A very small proportion of

students used Facebook to interact with the instructor for any topic (1-3%). Interactions via **IM** were almost non-existent for students in this sample (see percentages in Table 4.2).

Table 4.1

Mean frequencies of interactions by topic of interaction and by medium (descending order)

How many times have you communicated with the instructor about each of the following topics?	**Means**				
	f2f	**Email**	**Black board**	**Face book**	**IM**
Exams and assignments (e.g., homework, projects, quizzes)	2.38	2.35	1.74	1.02	1.02
Ideas from your readings or classes	1.98	1.65	1.41	1.01	1.00
Grades	1.97	1.88	1.57	1.01	1.00
Feedback on your academic performance	1.95	1.75	1.36	1.01	1.00
Advice on how to improve your understanding of the course material or your writing	1.85	1.73	1.29	1.02	1.00
Your career plans	1.72	1.59	1.13	1.02	1.00
Your course selection or academic program	1.63	1.58	1.17	1.01	1.00
Research project on which you worked with this instructor	1.62	1.60	1.23	1.01	1.00
Activities other than coursework that you worked on with this instructor (e.g., committees, orientation, student life activities)	1.55	1.51	1.13	1.03	1.01
Personal problems or concerns	1.44	1.34	1.07	1.02	1.00
Informal socializing (e.g., hobbies, greetings, birthday wishes)	1.44	1.23	1.04	1.06	1.00

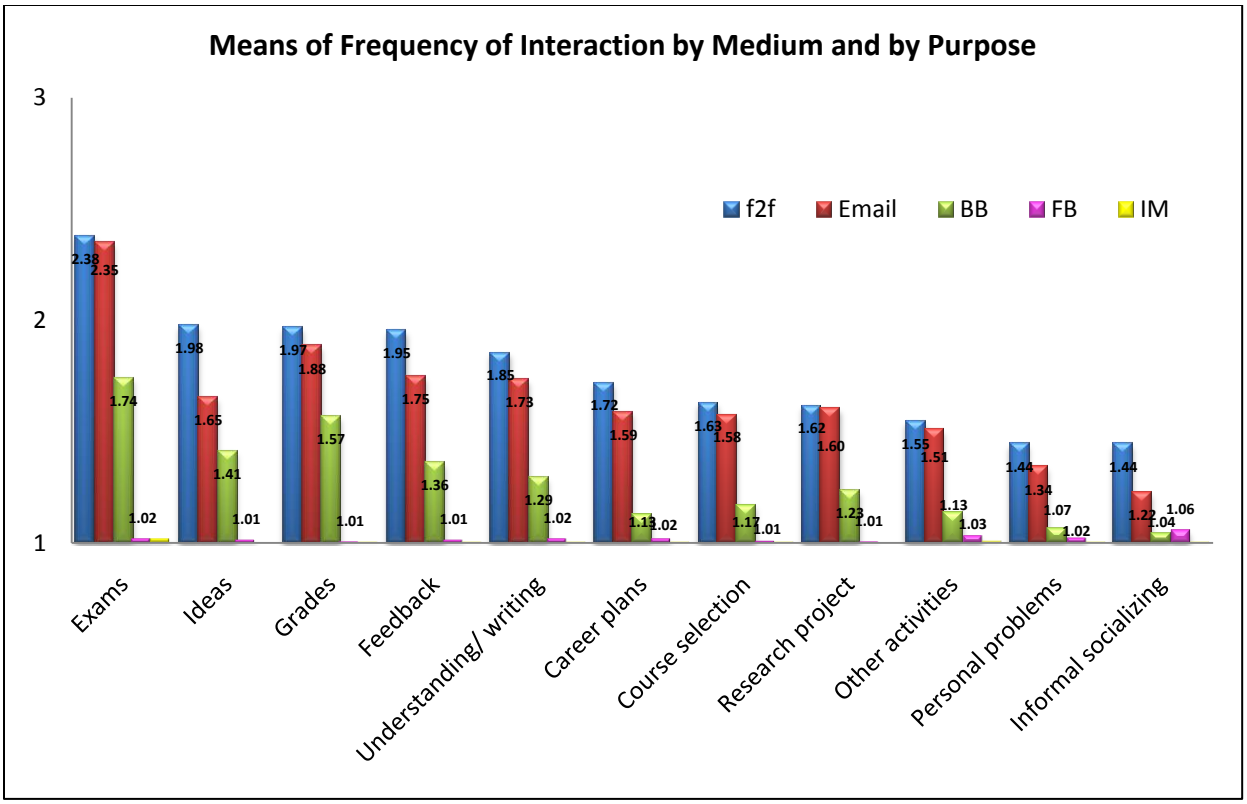

Figure 4.1 Mean frequencies of interaction by medium and by purpose

Comparisons across media showed that, in general, the highest percent of students communicated with the instructor f2f for any given topic. However, slightly higher percentages of students used email over f2f to communicate about exams and assignments, and about research projects (see Table 4.2).

Although the students in this sample reported infrequent interactions with the particular instructor whom they selected to report on, when reporting the number of instructors at the university with whom students have interacted at least once outside of class during the previous semester, descriptive statistics showed a mean number of instructors of 3.5, with a mode of 3.0. Thus, the majority of students (72%) had out-of-class interactions with three or more instructors. Therefore, it can be inferred that students interacted with instructors several times during the semester.

Table 4.2

Percentages of students interacting at least once per semester with the instructor, by topic and medium (descending order)

Topic	Percentages				
	f2f	**Email**	**Black board**	**Face book**	**IM**
Exams and assignments	86%	89%	44%	1%	1%
Grades	71%	65%	36%	0%	0%
Feedback on your academic performance	67%	55%	25%	1%	0%
Ideas from your readings or classes	63%	47%	25%	1%	0%
Advice on how to improve your understanding of the course material or your writing	57%	54%	21%	1%	0%
Your career plans	50%	41%	9%	2%	0%
Your course selection or academic program	43%	42%	13%	1%	0%
Research project on which you worked with this instructor	39%	41%	17%	0%	0%
Activities other than coursework that you worked on with this instructor	38%	36%	10%	3%	0%
Personal problems or concerns	34%	28%	6%	2%	0%
Informal socializing	32%	17%	3%	3%	0%

Technological profile of the respondents

To understand better the characteristics of respondents in this sample, further descriptive statistics were performed. Concerning students' technological experience, on average, these students had 12 years of experience with computers (M = 12.5, SD = 3.5) and 10 years of Internet experience (M = 10.1, SD = 2.6). A large majority of students (75%) had a Facebook account for three or more years.

Regarding students' online behavior, the majority of students (80%) checked their email account several times a day or continuously. More than two-thirds of the respondents (68%)

checked their Facebook account several times a day or continuously, while more than half of students (53%) did the same regarding their Blackboard account. The least used online tool was instant messaging (IM), with 11% of students using their IM account several times a day or continuously. All students went online every day and a vast majority (91%) spent online two to 10 hours daily. While almost all students in this sample (96%) logged into their Facebook account every day, more than half (53%) spent between one and eight hours daily on Facebook, with a mode of 1-2 hours (30%). The number of reported Facebook friends ranged between 20 and 5,000 (M = 673.9, SD = 524.6). Interestingly, more than half of students (52%) had at least one instructor among their Facebook friends. On average, students had two instructors among their Facebook friends (after two outliers were removed) and almost half of students (48%) had between two and ten Facebook friends from among instructors. However, being connected with instructors on Facebook did not assure that interactions (defined as unidirectional or bidirectional communications) would take place in this online space with only 5% of respondents reporting interactions on Facebook with their instructor.

RELIABILITY OF THE STUDENT-INSTRUCTOR RELATIONSHIP SCALE (SIRS)

The *Student-Instructor Relationship Scale* (SIRS) was used to assess students' perceptions of relationship with instructors. This scale was reported in previous publications (Creasey, Jarvis & Knapcik, 2009; Creasey, Jarvis & Gadke, 2009) as a reliable and valid instrument with two dimensions: *Instructor Connectedness* and *Instructor Anxiety*. In two previous studies, Creasey, Jarvis, and Knapcik (2009) and Creasey, Jarvis, and Gadke (2009) reported very good internal consistency for the *Connectedness* subscale (α =.89 and α = .92), and the *Anxiety* subscale (α = .89 and α = .87). However, because the authors recommended that their instrument be subjected to further psychometric investigation, prior to utilization in subsequent

analyses, the instrument's reliability was re-tested with these data. In this sample, the internal consistency of the instrument proved very good (George & Mallery, 2003; Lounsbury, Gibson, & Saudargas, 2005). Cronbach's alpha for the *Connectedness* subscale was .92, while the *Anxiety* subscale yielded a coefficient alpha of .90.

FACTOR ANALYSIS

Preliminary considerations

To confirm the factor structure of the instrument reported by Creasey, Jarvis, and Knapcik (2009), the nineteen items of the SIRS (eleven measuring connectedness and eight measuring anxiety) were submitted to factor analysis. Prior to factor analysis, several criteria were clarified to demonstrate the adequacy of performing factor analysis with this sample. First, based on Tabachnick and Fidell's (2007) recommendations for sample size, a sample with more than 300 observations is adequate for factor analysis (in this study n = 320). Second, the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was computed to test whether the correlations between variables were high enough to cause multicollinearity. The KMO can take values between 0 and 1, values larger than .6 being desirable (Hinton, Brownlow, McMurray, & Cozens, 2004). In this study, the KMO value of .94 suggests the absence of multicollinearity and the adequacy of performing factor analysis. Third, the Bartlett's test of sphericity produced an approximate chi-square of 4013.82, $p < .001$, which indicates that the correlation matrix was not an identity matrix and that factor analysis could be performed with these data (Hinton et al., 2004). Fourth, the variables to be factor analyzed were screened for multicollinearity (Tabachnick and Fidell, 2007), which is present when high correlations exist between variables. When present, multicollinearity can weaken the analysis by "inflating the size of error terms" (Tabachnick and Fidell, p.89). According to Tabachnick and Fidell, multicollinearity can be

suspected with two or more correlations of .9 or higher. With only one bivariate correlation as high as .86, multicollinearity was considered unlikely for these data.

Factor analysis for the SIRS

The Student-Instructor Relationship Scale variables were submitted to confirmatory factor analysis. Principal Axis Factoring extraction with varimax rotation was used to extract two factors and verify whether the two-factor solution reported by Creasey, Jarvis, and Knapcik (2009) is supported by these data. Varimax is an orthogonal rotation recommended when the factors are subsequently used in analysis as independent or dependent variables (Tabachnick & Fidell, 2007). The results (rotated factor matrix) corroborated Creasey, Jarvis, and Knapcik's solution, showing "good" (.55 and higher) variable loadings on factors and no crossloading (Tabachnick & Fidell). The two factors, instructor connectedness and instructor anxiety, accounted for 59.45% of the total variance. Loadings of variables on factors, communalities, eigenvalues, and percentages of variance are presented in Table 4.3. A loading cutoff of .45 was set in SPSS, with zeros substituted for smaller loadings (Tabachnick & Fidell, 2007).

Table 4.3

Confirmatory factor analysis solution for the SIRS

Item	Factor		Communalities (h^2)
	Instructor Connectedness	Instructor Anxiety	
The instructor was concerned with the needs of his or her students.	.62		.47
It was not difficult for me to feel connected to this instructor.	.58		.42
I felt comfortable sharing my thoughts with this instructor.	.67		.57
I found it relatively easy to get close to this instructor.	.79		.71
I was very comfortable feeling connected to this instructor.	.83		.79
I usually discussed my problems and concerns with this instructor.	.55		.31
I could tell this instructor just about anything.	.57		.33
I felt comfortable depending on this instructor.	.72		.54
If I had a problem in that class, I knew I could talk to the instructor.	.67		.57
It was easy for me to connect with this instructor.	.74		.70
I knew this instructor could help me if I had a problem.	.71		.56
I was afraid that I would lose this instructor's respect.		.64	.41
I worried a lot about my interactions with this instructor.		.65	.44
This instructor made me doubt myself.		.64	.56
I was nervous around this instructor.		.66	.50
I was scared to show my thoughts around this instructor.		.75	.68
I worried that I would not measure up to this instructor's standards.		.72	.52
I was afraid that if I shared my thoughts with this instructor.		.77	.68
I often worried that my instructor did not really like me.		.71	.64
Eigenvalues	**8.76**	**2.53**	
Percentage of variance	**46.13**	**13.32**	

Factor analysis for the frequency of Student-Instructor Interactions (SII) items

To evaluate the frequency of student-instructor interactions (face-to-face and computer-mediated) I adapted an instrument consisting of eleven items, each one targeting a distinctive purpose/ topic of interaction (see Chapter 3 for more details). Since the goal was to utilize the frequency of SII items for further analysis to identify the role of online interactions in student-instructor relationships, these eleven SII items were factor analyzed. Given that data were available for the set of items in each CMC mode and for the face-to-face mode, factor analyses of the SII items were conducted for the three distinctive interaction modes: face-to-face, email, and Blackboard. Although the items were identical for each interaction mode, repeating the factor analysis for each subset of observations provided additional confirmatory support for the factor solution.

For the face-to-face subset of the SII variables, the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) of .89 showed that multicollinearity was not likely. Moreover, Bartlett's test of sphericity produced an approximate chi-square of 1674.29, $p < .001$, indicating that the correlation matrix was not an identity matrix. Therefore performing factor analysis was appropriate for these data. Principal axis factoring with orthogonal rotation (Varimax) produced a two-factor solution (two factors with eigenvalues greater than one; see Figure 4.2 for Scree plot). The majority of loadings were "very good" (larger than .63) and, at a cutoff of .45, none of the variables exhibited crossloading on both factors (Tabachnick & Fidell, 2007, p. 649). The two factors labeled "Course-Related Interactions" and "Student Interest-Driven Interactions" explained 61.34% of the total variance. The factor analysis solution for the frequency of face-to-face interactions is presented in Table 4.4, with a loading cutoff of .45.

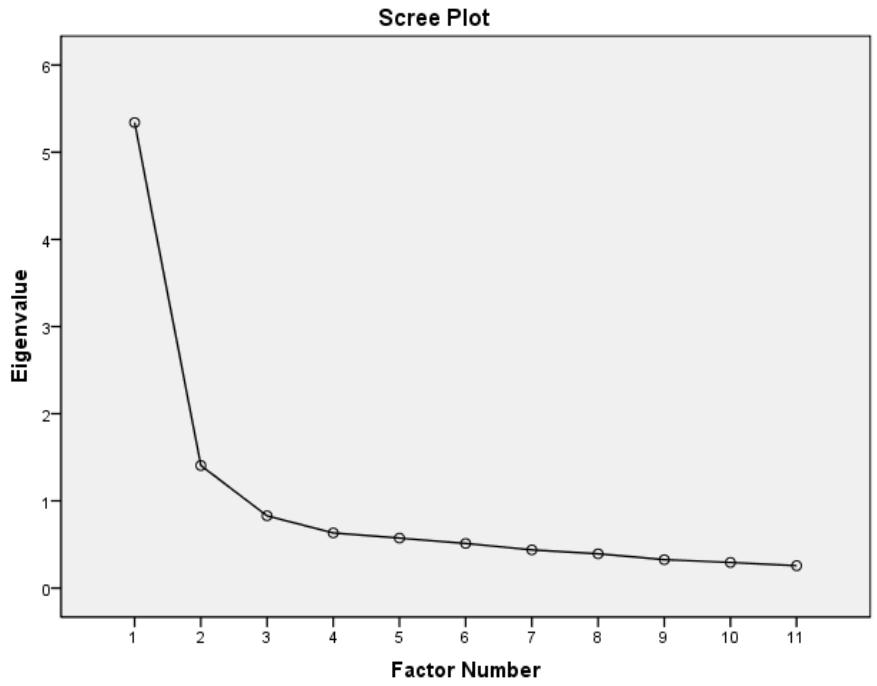

Figure 4.2 Factor analysis of the frequency of face-to-face student-instructor interactions. Scree plot.

Table 4.4

Factor analysis solution for the frequency of face-to-face interactions

Item (*How many times have you communicated with the instructor about each of the following topics?)*	Factor		Communalities (h^2)
	Course-related interactions	Student interest-driven interactions	
Grades	.60		.39
Exams and assignments (e.g., homework, projects, quizzes)	.77		.61
Ideas from your readings or classes	.64		.50
Feedback on your academic performance	.71		.63
Research project on which you worked with this instructor	.53		.36
Advice on how to improve your understanding of the course material or your writing	.73		.65
Your career plans		.78	.64
Activities other than coursework that you worked on with this instructor (e.g., committees, orientation, student life activities)		.74	.59
Your course selection or academic program		.64	.59
Personal problems or concerns		.65	.52
Informal socializing (e.g., hobbies, greetings, birthday wishes)		.57	.36
Eigenvalues	**5.34**	**1.41**	
Percentage of variance	**48.56**	**12.78**	

Within the email subsample (KMO .86; Bartlett's test – chi-square 1061.16, $p < .001$), principal axis factoring with Varimax rotation revealed two factors with eigenvalues larger than one, which accounted for 51.67% of the total variance. The factors consisted of the same sets of items and were labeled similarly to the factors extracted in the face-to-face subset ("Course-Related Interactions" and "Student Interest-Driven Interactions"). In general, this solution produced "good" variable loadings (loadings larger than .45 are considered "good") with the exception of one variable with fair loading ("fair" loadings are those between .32 to .45; Tabachnick & Fidell, 2007). In addition, one variable (i.e., communicated with instructors about personal problems and concerns) exhibited problematic crossloading on both factors (see Appendix F for the factor analysis solution for the frequency of email interactions). However, the two-factor solution was considered acceptable and retained in connection with the two-factor solution obtained with the Blackboard interaction items, which showed "excellent" loading (i.e., above .71) for the same variable.

For the Blackboard subset of student-instructor interaction items, preliminary analysis showed that factor analysis was adequate for these data (KMO was .89 and the Bartlett's test of sphericity yielded an approximate chi-square of 2119.61, $p < .001$). Principal axis factoring with Varimax rotation produced a two-factor solution similar to the face-to-face and email subsets. The two factors explained 67.55% of the total variance. One of the variables exhibited crossloading on both factors ("Your course selection or academic program" - see Appendix G).

The Facebook and IM subsets, did not exhibit enough variability (with only 16 and 3 respondents respectively who reported interactions with instructors via these tools), and therefore were not appropriate for factor analysis. Thus, the same two-factor solution was used to group the Facebook items for further analyses. The IM variables were not used in subsequent analysis.

RELIABILITY OF THE FREQUENCY OF STUDENT-INSTRUCTOR INTERACTION FACTORS

An internal consistency estimate of reliability was calculated separately for the two factors retained based on factor analysis. With the face-to-face subset, both dimensions (*Course-Related Interactions*, α = .86 and *Student Interest-Driven Interactions*, α = .85) displayed good to excellent internal consistency (George & Mallery, 2003; Lounsbury, Gibson, & Saudargas, 2005). The Blackboard subset of responses yielded similar reliability (α = .89 and α = .84, respectively), while the email subset produced alpha coefficients of .78 and .77 respectively (see Table 4.5 for internal consistency coefficients).

Table 4.5

Internal consistency coefficients for the frequency of interaction factors by data subset

Data subset	Factor internal consistency (Cronbach's alpha)	
	Course-related interactions	**Student interest driven interactions**
Face-to-face	.86	.85
Email	.78	.77
Blackboard	.89	.84

REGRESSION ANALYSES

To answer the first research question, two hierarchical multiple regressions were employed to identify whether the online interactions contribute to student-instructor relationship (measured as connectedness and anxiety) above and beyond the prediction afforded by demographic variables and face-to-face interactions. For both analyses the following entry format was used: age, gender, and year of study (Step 1); grade earned in the instructor's class (Step 2); the frequency of and satisfaction with face-to face interactions (Step 3); and the frequency of and satisfaction with interactions with each of the CMC tools (email, Blackboard, and Facebook) (see Figure 4.3 for the regression model). Because two separate regression analyses were performed, which was likely to increase the Type I error risk (Huck, 2004), the Bonferroni technique was used to adjust the level of α to .025 (.05/2 = .025) for each test, which assured an overall alpha level of .05. Therefore, statistical significance was reached at $p < .025$.

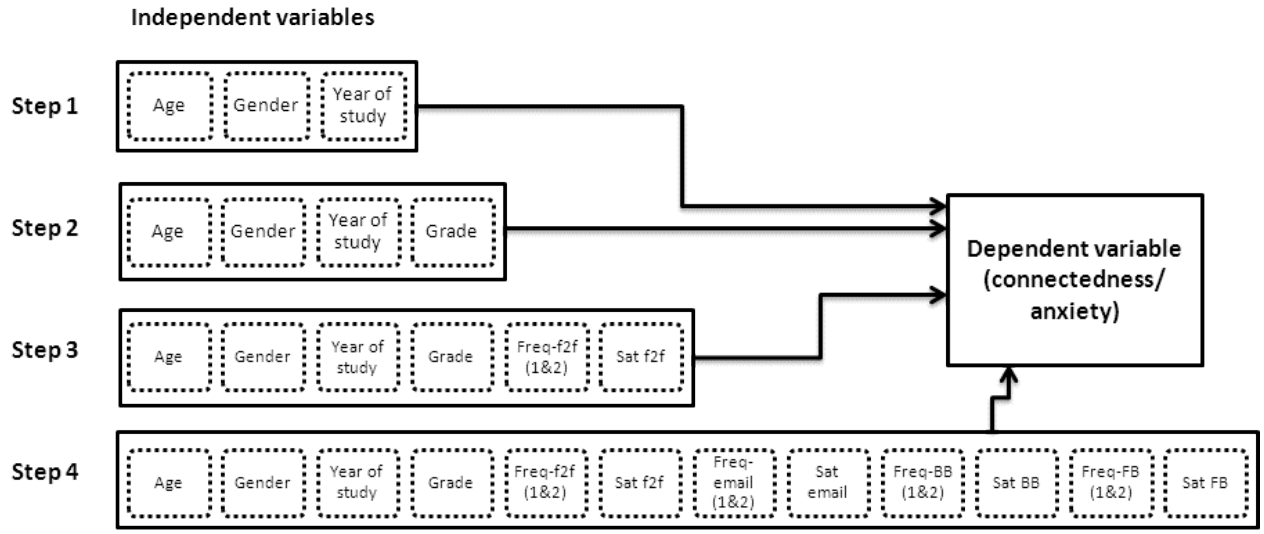

Figure 4.3. Hierarchical regression model

Variables

The student-instructor connectedness score (DV1) and student-instructor anxiety score (DV2) were calculated based on the results of factor analysis as mean scores of the variables that defined each factor (as suggested in Creasey, Jarvis, & Knapcik, 2009). Based on Tabachnick and Fidell's (2007) recommendations, regression analyses were performed with f2f, email, and Blackboard frequency of interactions factors scores estimated using the regression method, which is the most frequently used and "results in the highest correlations between factors and factor scores" (Tabachnick & Fidell, 2007, p. 650). The SPSS factor score estimation writes new variables within the dataset for the factor scores ("Scores" tab). The frequency of interactions factors scores for Facebook were calculated as means scores (due to inappropriate sample size for performing factor analysis on the Facebook subsample). Due to high skewness and kurtosis, the Facebook frequency of interaction factor scores were transformed using logarithmic transformation following that transformed scores were used in subsequent analyses (Tabachnick & Fidell, 2007).

The variables reflecting student satisfaction with student-instructor interactions (one for each online tool: email, Blackboard and Facebook) were computed by multiplying the satisfaction score (1 through 4) with a dummy variable which reflected whether the students had interacted or not with the instructor using each tool. In this way, missing values were avoided for the satisfaction variables for those respondents who had not used some of the CMC tools.

Age, gender, year of study and grade obtained in the instructor's class were used as control variables. Dummy variables were created for sophomore, junior, and senior, one for each degree of freedom in the year of study variable (Tabachnick & Fidell, 2007).

Preliminary considerations

Prior to performing multiple regressions, data were screened for multicollinearity. First, bivariate correlations between variables were inspected and no correlation above .90 was identified, which indicates that multicollinearity was unlikely (Tabachnick & Fidell, 2007). Second, the collinearity diagnostics showed that no condition index greater than 30 was coupled with variance proportions greater than .50 for two or more variables concurrently (Tabachnick & Fidell). Moreover, none of the tolerances (1-SMC) approached zero. Therefore, regression analyses could be performed with these variables without concern for multicollinearity.

Results for regression on Student-Instructor Connectedness

Within the hierarchical regression on connectedness, the multiple correlations *(R)* were significant after each step, except step 1. Moreover, the R^2 change was significant at each step. At **step 1**, age, gender, and year of study did not significantly predict student-instructor connectedness (see Table 4.6 for the Connectedness regression model). After **step 2**, when grade (obtained in the instructor's class) was entered in the equation, $R^2 = .09$, F (6, 313) = 5.05, $p < .001$. Grade alone accounted for approximately 8% of the variance in connectedness (R^2 change = .08). At **step 3**, frequency of f2f interactions (two variables) and satisfaction with the f2f interactions were added in the equation resulting in $R^2 = .25$, F (9, 310) = 11.63, $p < .001$. Thus, frequency of and satisfaction with f2f interactions and grade (and demographic variables) accounted for 25% of the variability in connectedness. Sixteen percent of this variability came from frequency and satisfaction with f2f interactions and significantly improved the explained variance in connectedness.

Table 4.6

Connectedness regression model

Model	R	R^2	Adjusted R^2	Std. Error of Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
Step 1	.09	.01	-.01	1.15	.01	0.48	5.00	314.00	.793
Step 2	.30	.09	.07	1.10	.08	27.70	1.00	313.00	.000
Step 3	.50	.25	.23	1.00	.16	22.70	3.00	310.00	.000
Step 4	.55	.31	.26	0.98	.05	2.55	9.00	301.00	.008

After **step 4**, with all variables in equation, the coefficient of determination (R^2) was .31, F (18, 301) = 7.04, $p < .001$, indicating that approximately 31% of the variance in student-instructor connectedness was predicted by the frequency of and satisfaction with f2f, email, Blackboard, Facebook, grade obtained in the class, and demographic variables. Addition to the equation of frequency of email, Blackboard, and Facebook interactions and satisfaction with these interactions improved the prediction with 6%.

Within this model, only four variables were identified as independent predictors of the student-instructor connectedness: grade ($B = .09$, $p < .01$), frequency of f2f student interest-driven interactions (frequency f2f - factor 2) ($B = .27$, $p < .01$), satisfaction with f2f interactions (satisfaction f2f) ($B = .26$, $p < .01$), and satisfaction with email interactions ($B = .30$, $p < .001$). It appears that students felt more connected with their instructor when (1) the grade they obtained in the instructor's class was higher; (2) students had more face-to-face interactions with the instructor for student interest-driven communication; (3) they were more satisfied with the f2f interactions; and (4) they were more satisfied with the email interaction. Table 4.7 displays the

unstandardized regression coefficients (B), the standardized regression coefficients (beta), and *R*, R^2, and adjusted $R^{2,}$ at step 4.

Table 4.7

Hierarchical multiple regression on connectedness (results after step 4)

Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	**SE B**	**Beta**		
(Constant)	2.68	.62		4.31	.000
Age	-.01	.02	-.03	-.58	.566
Gender	.14	.14	.05	1.03	.306
Sophomore	-.54	.32	-.09	-1.69	.091
Junior	-.13	.18	-.04	-.71	.477
Senior	-.16	.17	-.07	-.98	.329
Grade	.09**	.04	.14	2.70	.007
Frequency f2f - factor 1	.06	.08	.05	.81	.417
Frequency f2f - factor 2	.27**	.09	.21	2.95	.003
Satisfaction f2f	.26**	.09	.19	3.05	.003
Frequency email -factor 1	-.03	.08	-.02	-.33	.743
Frequency email -factor 2	.04	.09	.03	.41	.684
Satisfaction email	.30***	.08	.24	3.85	.000
Frequency BB-factor 1	.01	.10	.01	.07	.945
Frequency BB-factor 2	-.10	.07	-.08	-1.46	.145
Satisfaction BB	.01	.06	.02	.20	.839
Frequency FB-factor 1	.25	2.00	.01	.13	.900
Frequency FB-factor 2	1.67	2.14	.07	.78	.434
Satisfaction FB	-.08	.16	-.04	-.54	.590
R = .55, R^2 = .31, Adjusted R^2 = .26					

**$p < .01$; ***$p < .001$

Results for regression on Student-Instructor Anxiety

The hierarchical regression on student-instructor anxiety produced multiple correlations *(R)* significantly different from zero ($p < .025$) at each step with the exception of step 1 (see Table 4.8 Anxiety regression model). Age, gender and year of study accounted for only 2% of the variability in the anxiety score. At step 2, when grade was added to the equation, the model explained 11% of variability ($R^2 = .11$, F (6, 313) = 6.32, $p < .001$). After step 3, with frequency of f2f interactions (two variables) and satisfaction with the f2f interactions entered in the model, $R^2 = .14$, F (9, 310) = 5.67, $p < .001$. At step 4, with all 18 variables in the equation, the model explained 18% of the variability in student anxiety, with $R^2 = .18$, F (18, 301) = 3.60, $p < .001$. Although the model at step 4 was significant and satisfaction with email interactions made a unique contribution to the variance in student-instructor anxiety ($B = -.25$, $p < .01$), the addition of frequency of and satisfaction with email, Blackboard and Facebook interactions did not predict anxiety above and beyond the prediction afforded by demographic variables and f2f interactions (R^2 change = .04, $p > .025$) (see Table 4.8 Anxiety regression model). Satisfaction with the f2f interaction, which was a significant predictor of anxiety after step 3 ($B = -.28$, $p < .01$), did not significantly predict anxiety after online interactions were added (see Table 4.9).

Table 4.8

Anxiety regression model

Model	R	R^2	Adjusted R^2	Std. Error of Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
Step 1	.13	.02	.00	1.18	.02	1.089	5	314	.366
Step 2	.33	.11	.09	1.12	.09	31.965	1	313	.000
Step 3	.38	.14	.12	1.11	.03	4.001	3	310	.008
Step 4	.42	.18	.13	1.10	.04	1.445	9	301	.168

Table 4.9

Hierarchical multiple regression on anxiety (results after step 4)

Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	**SE B**	**Beta**		
(Constant)	4.91	0.70		7.06	.000
Age	0.00	0.03	0.00	-0.02	.980
Gender	-0.25	0.15	-0.09	-1.61	.109
Sophomore	0.02	0.36	0.00	0.07	.945
Junior	0.12	0.20	0.04	0.59	.556
Senior	0.29	0.19	0.12	1.53	.126
Grade	-0.16***	0.04	-0.23	-4.02	.000
Frequency f2f - factor 1	0.11	0.09	0.08	1.24	.217
Frequency f2f - factor 2	0.03	0.10	0.02	0.31	.753
Satisfaction f2f	-0.13	0.10	-0.10	-1.38	.168
Frequency email -factor 1	0.09	0.09	0.06	0.97	.333
Frequency email -factor 2	0.02	0.10	0.01	0.19	.848
Satisfaction email	-0.25**	0.09	-0.19	-2.84	.005
Frequency Blackboard-factor 1	0.03	0.11	0.03	0.32	.753
Frequency Blackboard-factor 2	0.06	0.07	0.05	0.86	.389
Satisfaction BB	-0.02	0.06	-0.03	-0.34	.735
Frequency Facebook-factor 1	2.14	2.24	0.06	0.95	.341
Frequency Facebook-factor 2	-1.94	2.40	-0.08	-0.81	.418
Satisfaction FB	0.16	0.18	0.08	0.93	.353
$R = .42$. $R^2 = .18$, Adjusted $R^2 = .13$					

**$p < .01$; ***$p < .001$

SUMMARY

This chapter presented the results of the quantitative data analysis. Starting with an overview of the preliminary data screening and handling missing data, this chapter included descriptive statistics followed by presentations of the factor analyses, reliability analyses, and hierarchical regression analyses. Factor analysis confirmed the two-factor structure of the Student-Instructor Relationship Scale proposed by Creasey, Jarvis, and Knapcik (2009) and the two factors (Connectedness and Anxiety) were used as dependent variables in the subsequent hierarchical regression analyses. For the Student-Instructor Interactions items, factor analysis revealed two factors (Course-Related Interactions and Student Interest-Driven Interactions), which were used as independent variables in the regression analyses. The first hierarchical regression analysis showed that the frequency of and satisfaction with email, Blackboard, and Facebook significantly contributed to the prediction of the student-instructor connectedness above and beyond the predictive power of f2f interactions and demographic variables. The second hierarchical regression analysis revealed that the frequency of and satisfaction with email, Blackboard and Facebook interactions did not predict anxiety above and beyond the prediction afforded by demographic variables and f2f interactions.

In the next chapter, I present the findings of qualitative data analysis organized in three sections: participants' uses of online tools; meanings of online interactions; and expectations and practices in connection with online interactions. The final chapter, Chapter 6 includes an integrative discussion of the qualitative and quantitative findings, implications for practice, and directions for future research.

CHAPTER 5: FINDINGS OF QUALITATIVE ANALYSIS

The purpose of this study was to identify the role of computer-mediated communication (CMC) in the development of student-instructor relationships at the college level. In the previous chapter, I presented the findings derived from quantitative (survey) data. Briefly, I found that student-instructor interactions were infrequent regardless of the mode of communication (face-to-face or computer-mediated communication). Moreover, students communicated even less frequently with their instructors via computer-mediated communication (CMC) tools. Email communication had a similar frequency with face-to-face (f2f) communication, while interactions on Blackboard, Facebook, and instant messaging (IM) were much more infrequent. However, when frequency was not taken into account, findings showed that a majority of students interacted with their instructor at least once during the semester via email for course-related issues. Similar findings were identified for f2f communication. Further, approximately one third of the variance in student-instructor connectedness (a measure of student-instructor relationship) was explained by the frequency of and satisfaction with face-to-face, email, Blackboard, and Facebook; the grade obtained in the class, and demographic variables. Significant predictors of connectedness were the grade in the instructor's class, frequency of f2f student interest-driven communication, satisfaction with the f2f interactions, and satisfaction with the email communication. Neither the Facebook variables (frequency; satisfaction) nor the Blackboard variables significantly predicted student-instructor connectedness. For anxiety, the other measure of student-instructor relationship, findings indicated that the frequency of and satisfaction with email, Blackboard, and Facebook interactions did not predict anxiety above and beyond the prediction afforded by demographic variables and f2f interactions. Thus, neither f2f

interactions nor computer-mediated communication played a role in decreasing or increasing student anxiety, which was a negative measure of student-instructor relationship.

This chapter presents findings of the qualitative analysis, answering the following research questions: What meanings do students and faculty members make of their computer-mediated communication? How do students and faculty members negotiate their relationships via technology (i.e., email, Blackboard, Facebook, and IM)? The findings are organized into three sections. First, I start by introducing the participants' approach to using each of the online tools of interest (email, Blackboard, Facebook, and IM). Next, in answer to the research question "What meanings do students and faculty members make of their computer-mediated communication?" I present several patterns or themes that reflect participants' meanings of interactions via email, Blackboard, and Facebook. These meanings are presented separately for each tool (i.e., email, Facebook, and Blackboard). In the last section, I address the question "How do students and instructors negotiate relationships using CMC tools?" presenting the expectations and practices developed by participants in connection to using email and Facebook for student-instructor interactions. Given that the expectations and practices for Blackboard interactions were similar to the meanings presented for this tool, no further presentation is provided in the section on expectations and practices. In addition, although I initiated this study with the goal of including instant messaging among the online tools examined, due to the limited number of interviewees who had experienced student-instructor interactions via IM, no meaningful findings could be reported for the IM interactions.

Within this dissertation, I used pseudonyms self-selected by participants instead of actual names. The findings and descriptions provided in this chapter are supported whenever possible by excerpts from students and professors' interviews. Each excerpt is identified by the

participant's pseudonym and a number that points to the paragraph number in the corresponding transcript (e.g., Halley, 32). The terms used in this dissertation to refer to Facebook activity are those commonly employed by users to define their actions (e.g., to friend - to send a friend request on Facebook; Facebook friends - connections to other users' profiles). In addition, in this chapter, I used alternatively two terms to identify instructional faculty: *instructor* and *professor*. To refer to instructional faculty in general, I used the term *instructor* with a meaning synonymous to *teacher* (Webster Dictionary), and not to its corresponding category of employment. I used the term *professor* only to refer to the participating instructors in this study, who were all tenured or tenure-track professors.

PARTICIPANTS' USE OF ONLINE TOOLS

The students and professors interviewed for this study were purposively selected to be active users of computer-mediated communication, in order to provide rich information on the phenomenon of interest, student-instructor online interactions. However, as explained in Chapter 3, in the selection of participants, I gave priority to students and professors who have interacted on Facebook. Due to this rationale, the sample included very few participants who were users of IM for student-instructor interactions. Table 5.1 displays a matrix of participants' uses of online tools for student-instructor interaction.

Table 5.1

Participants' use of online tools for student-instructor interaction

Participant's pseudonym	Email	Blackboard	Facebook	Instant Messaging
Professors				
Alex	yes	no	yes	yes
Betty	yes	yes	yes/group	yes
Halley	yes	yes	yes/group	no
JWach	yes	yes	yes	no
Logan	yes	yes	yes/ former students	no
Orfeo	yes	yes	yes	no
Students				
Cleopatra	yes	yes	no	no
Cory	yes	yes	yes/group	no
Julia	yes	yes	yes	yes
Lauren	yes	yes	yes	no
Melanie	yes	yes	no	no
Steve	yes	yes	yes	yes

Professors' use

Email

All six professors interviewed for this study used email for student-instructor communication. All professors viewed email as an essential medium of communication with students, as part of their teaching and mentoring roles. They unanimously perceived that it was their professional responsibility to reply to students messages in a timely manner. In general, these professors adopted common strategies for using email such as sending additional course materials to students via group emails; responding to individual messages from students in one-two business days; providing letters of recommendations to students upon requests; dealing with students excuses for class attendance, to name a few.

Blackboard

All but one professor used Blackboard to communicate with students. Alex, an assistant professor, rejected Blackboard because, in spite of his technological sophistication, he perceived the use of this website "much more complicated than it should be" (Alex, 60). Instead, Alex relied heavily on email, Facebook, and instant messaging to manage the class material and to communicate with students. The other five professors used Blackboard intensively, focusing on providing information and learning materials to the students enrolled in their classes. For all of them, it was important that Blackboard allowed them to reach out conveniently to students with course announcements through the group email feature. Moreover, the use of Blackboard as a course repository was essential to them. They relied on Blackboard to make accessible to students all the digital materials need for classes.

Facebook

Although the approaches to using Facebook for student-instructor interaction varied among professors, all but one professor (Logan) used this CMC tool with current students. Yet, this instructor has utilized Facebook in the past and, at the time of the interview, he was still connected with former students although no longer open to accept new student friend requests on Facebook. As a rationale, he weighted the benefits of being connected with students (i.e., getting to know students better) against the risks and drawbacks of doing so (i.e., unfair grading; crossing ethical lines; inappropriate student-instructor interactions). The following excerpt illustrates Logan's reasoning around his decision to avoid Facebook as a means of communication with students:

> I decided that I didn't want students to be able to say "oh, he's a friend of mine on Facebook" when somebody else might not be and they'd wondered why I'd turned them down. Well, I just didn't want to get into that game … And if I let them be a friend on Facebook and still get an F in the class, that could be a problem because they thought I was their friend. "My friend wouldn't give me an F." No, I'm not your friend. I'm sorry. [laughing] (Logan, 125)

Thus, for Logan, setting and maintaining boundaries that clearly delimited his teaching role and potentially ensured grade equity were far more important than getting to know students better through Facebook connections. By rejecting the use of this CMC tool, Logan situated himself at the far end of the continuum of Facebook use for student-instructor interactions.

Although sharing similar concerns about the risks of blurry boundaries between instructors and students' roles, other professors developed different strategies that allowed them to use Facebook for student-instructor interaction, instead of avoiding this space all together. For example, Betty and Halley employed a strategy that allowed them to be present in this environment and reach out to students without compromising private-professional boundaries. Their use of Facebook group pages instead of personal profiles allowed them to clearly define

their Facebook presence to students as "professional" or "official." Betty, an associate professor and coordinator of a student association in her college, used a Facebook group page for the student association duties, to project her mentoring role within the online environment, while choosing not to connect with students via her personal profile. Similarly, Halley, an assistant professor, created a Facebook page in connection with a program of study abroad that she coordinated, while she intentionally managed the privacy of her personal profile by selectively accepting friend requests from current students. Her approach was to accept requests from students with whom she worked closely and to ignore requests from students with whom she did not have a connection outside of a particular class (e.g., mentoring, study abroad, research collaboration). Likewise, Orfeo adopted the strategy by which he responded selectively to student Facebook requests. His reasons for controlling the flux of Facebook interactions this way, however, were dictated by concerns with time management. However, unlike Betty and Halley, Orfeo was more preoccupied with time constraints (i.e., protecting his personal time) than with enforcing strict boundaries for privacy purposes. Orfeo explained: "if it starts taking too much time or it's incredibly boring, which is incredibly easy, it just isn't worth it" (Orfeo, 38). To avoid investing too much time in Facebook interactions with students, he limited the connections to students in his "honor" classes or students whom he mentored.

Along the continuum of Facebook use, JWach and Alex used Facebook to communicate with students without obvious concerns for privacy or time management. Their approach was to accept unselectively students' friend requests, which showed that reaching out to students weighted more to them than maintaining privacy boundaries. Different in their approach was the orientation to using Facebook as an extension of their professional identity into the online environment. Their presence on Facebook seemed congruent with their presence in the

classroom and on campus; they were performing professor roles both offline and online. JWach used Facebook to share information related to his teaching/ research discipline and to educate and motivate his online student friends. Alex used Facebook primarily to be able to reach out to students in the preferred environment and to learn about students' lives, information that he viewed essential for motivating students and creating a sense of comfort in his mathematics classes.

Instant messaging

Finally, only two professors used instant messaging to communicate with students. While Betty had very rare interactions with undergraduate students via the chat feature of Blackboard, Alex used intensively several instant messaging services such as AIM or Skype to reach out and be available to students.

Students' use

Email

All participating students used email to interact with instructors. Students perceived email as the official channel of communication and used it especially to clarify course-related issues such as attendance, grades, assignment deadlines, and to request assistance with the course assignments.

Blackboard

All students in this sample also used Blackboard in connection to their courses. However, while they checked frequently the Blackboard site to find information, updates and material for courses, to turn in assignments, and to take online quizzes, most of them did not use the interactive features of Blackboard (e.g., chat, discussion boards) to communicate with instructors.

Facebook

While all six students had Facebook profiles and used regularly Facebook for personal interactions, four students (Cory, Julia, Lauren, and Steve) had interactions with instructors on Facebook. Cory, Julia, and Lauren each had one instructor among their Facebook friends. Based on Facebook observations, during a one-month period, Julia and Lauren had few interactions with the instructors. Steve had two former instructors among his Facebook friends, but no interactions were noted during the observation period. In addition, Cory has interacted with an instructor and peers on a Facebook group page created for a class. In his view, the experience of a Facebook group page was not "personal communication" and in this respect, very different from the interactions experienced through a personal Facebook account. Melanie and Cleopatra did not connect with instructors on Facebook because they viewed this site as a space too informal for student-instructor interactions.

Instant messaging

Only two students (Julia and Steve) used instant messaging to communicate with instructors. Julia talked about using frequently the chat feature of Facebook to communicate, while Steve had used Aplia, software that supported synchronous communication with the instructor in connection with one of his classes.

MEANINGS OF ONLINE INTERACTIONS

In response to the research question "What meaning do undergraduate students and instructors make of their computer-mediated communication?" I present the meanings that students and professors made of their interactions via email, Blackboard, and Facebook. Given that very few of the participants used instant messaging, there was not enough data to derive common patterns across this sample.

Meanings of email interactions

Official/ formal interactions

Most of the participants, professors and students alike, regarded email as a medium appropriate for formal interactions. For professors, what made email an official means of communication was related to its capability to record and archive information. This feature was important because it allowed them to document the formal communication with students. For example, Betty explained:

> I would much rather have a more formal discussion than the text messaging when it's related to classroom learning issues and probably the cleanest reason is because I want a paper trail. I want some type of trail or documentation... (Betty, 32)

Given that Betty viewed course-related communication as a business communication that "should be conducted in a more formal way", her preferred means of communication was email. Documenting online exchanges with students was also important to Orfeo, who illustrates a similar point: "so I'm very confident [email is] the best way to file and record things; I can look at the last few weeks of exchanges with students or colleagues and extract their content instantly" (Orfeo, 12).

Students viewed email as the "official" online tool through which they communicated with instructors about academic matters. When students had questions related to the course content or when they needed letters of recommendations, email was the appropriate medium of communication. Talking about students' practices, professor Alex confirmed this point: "[students] will use email if they have a clear question." In general, email was not the preferred tool for students to address personal issues. Steve mentioned "I don't really email my teachers to say 'hey, how's going' but, you know, but if it's a little more professional..." (Steve, 92). Pointing out that students avoid discussing personal matters via email, Alex mentioned: "they have the feeling about email that it's the official address and, you know, it's *scripta manent,*

whatever is written there, is forever" (Alex, 70). Alex suggested that, from among the online tools that students use, email was the least preferred by students for personal communication.

The meaning of email as an official tool relates to students' expectation that instructors have a professional responsibility to respond to students' emails, especially if they are related to class. Cory talked explicitly about this: "it's through their business email address and it's their obligation to reply". Professor Orfeo shared the same view: "I think of [email] as professional responsibility."

Meanings of Blackboard interactions

Instructors' Blackboard – Posting "virtually everything for the course"

All professors but Alex used Blackboard as a teaching tool. Most commonly for the interviewed professors, Blackboard represented a repository of information that stored all the materials and resources employed within particular courses. Blackboard was a convenient space for this kind of storage because it allowed logical organization of the materials based on various criteria such as date, or content. In addition, professors could manage the content such that information was available or hidden according to the instructional design of the course and students' needs. Halley illustrated very succinctly the meaning of Blackboard as a course repository:

> So, I put everything [on Blackboard]; all of these assignments are in folders. So, the students can really use Blackboard instead of having to go to the course reserves or use the library; they can just use the Blackboard site. (Halley, 12)

Viewed as an integrated repository of information, Blackboard provided a website-like environment for students to access information. The main difference between Blackboard used as a course repository and a personal website, on which the professor makes available all the information necessary for a course, consisted of the password-protected access characterizing

Blackboard. Discussing this point, Orfeo emphasized: "there are things that I can post through Blackboard that I cannot put on my webpage for copyright infringement" (Orfeo, 93).

It is interesting to note that the professors regarded their activity on Blackboard as a form of interaction with students, although in the wide majority of cases the activity consisted of posting course-related information and emailing additional resources to the entire class. Thus, JWach mentioned: "I communicate with students through Blackboard in all the classes that I teach, partially because I think our department encourages us to do so, plus is kind of an effective way of getting information out to students quickly (JWach, 8). At the same time, when thinking about the same activity (posting, sending emails to the whole class), students did not perceive it as interaction with instructors.

In addition, Halley and JWach capitalized on the email feature of Blackboard, oftentimes sending to the whole class emails containing links to additional class resources. Halley described her approach:

> …sometimes I wonder if my students think that I'm like a little bit like, you know, neurotic or something [laughter] 'cause I email them very frequently using Blackboard, about all kind of stuff, whether is something like this or is "hey, I saw this article on New York Times today and that's totally relevant to something that we were just talking about in class. If you have time click the link" (Halley, 8)

Unlike Halley who was enthusiastic about communicating with students via Blackboard email, Orfeo was discontent with the email capabilities of Blackboard because of limitations such as lack of spell checking and archiving.

Orfeo, Logan, and JWach used Blackboard to set up online quizzes with automatic grading and to make grades available to students via the grade center. Although students took advantage of these features, they did not perceive taking an online quiz or checking their grades as interactions with instructors.

While the majority of professors interviewed did not use features of Blackboard that supported two-way communication (e.g., chat, discussion boards, blogs), Halley talked about setting up group discussion boards on which students collaborated on projects. However, the degree of involvement on behalf of the instructor in these group discussions was not clear.

Students' Blackboard – Missing interactivity

The theme describing students' meaning of Blackboard was *missing interactivity* or, in Steve's words, "there is not really that much interaction" (Steve, 24). Five out of six interviewed students emphasized that "interaction" is not the appropriate term to describe how students commonly use Blackboard. Answering my question whether he used online tools other than email and Facebook to interact with instructors, Steve illustrated this perspective:

> Nah! I think that would be like Blackboard, but I don't know; it's not really interacting with them, they just put assignments and every course material on there and we just look at it; there is not really that much interaction. (Steve, 24)

Steve and other students argued that the most common purpose that Blackboard served was to provide access to course information and material, being primarily a repository of information. Students, similar to professors, pointed out that most instructors post on Blackboard all materials needed for classes such as syllabi, digital articles for class readings, and resources for assignments. In addition, instructors send messages, announcements, and updates to the whole class about the instructional process. Although students acknowledged the utility of Blackboard, they experienced student-instructor communication via Blackboard as indirect and most often one-way communication. Although students had the option to use the Blackboard features to transform the one-way communication into two-way communication (e.g., email, chat, discussion board), they did not choose to use Blackboard as an interactive environment. Julia, for example, clearly stated this point of view:

> I: And do you use Blackboard? J: Not to communicate with them, that's how they communicate with us, like they'll put assignments up and post notices and stuff. So they're generally communicating, like it will be something that's out of the blue and they'll say "oh, hey, by the way blah, blah, blah" and that will let me know but I'm only receiving that communication, I don't use Blackboard for my own purposes to communicate with them; it's more me checking in for notices and stuff. (Julia, 41-42)

Viewing Blackboard as a territory controlled by instructors, Julia emphasized that in this environment instructors are the ones to initiate one-way communication.

Moreover, Cleopatra, a first year student with less experience with Blackboard, revealed even more sharply that "you cannot talk to [instructors] on Blackboard but that's how they get out their messages and announcements" (Cleopatra, 4), which suggests that she, perhaps, was not even aware that Blackboard allowed student-initiated communication with the instructor.

In turn, students used Blackboard to retrieve the class material, to turn in assignments and take online quizzes, which they again viewed as indirect, one-way communication. As an exception, two of the participating students, Lauren and Melanie, talked about using discussion boards, which allowed for two-way communication between students and instructors. Although interactive uses of Blackboard were rare, some instructors set up discussion boards on which students submitted questions related to class material or assignments for the instructor or other students to answer. Melanie described a similar experience:

> …some of the professors put discussion boards up on Blackboard, which I think it's good; instead of emailing the teacher directly a question, you put it on the discussion board in case other people had the same question so teachers are not getting bombarded with hundreds of the same question. I like the discussion boards a lot because you can get more feedback; sometimes somebody will answer you before the professor will and I think that's good. (Melanie, 16)

It is interesting to note that Melanie appreciated and took advantage of the direct communication on Blackboard when it was available. At the same time, professor Logan pointed out that students rarely capitalize on the interactive tools of Blackboard such as wikis, blogs, or discussion boards, and suggested that students are responsible for not engaging with the

interactive tools. A mismatch of expectations between students and instructors related to the interactive features of Blackboard was visible in these data.

Meanings of Facebook interactions

The meanings identified for the Facebook interactions were shared by both groups, students and instructors. Therefore, I present these meanings in an integrative fashion, capitalizing on data triangulation to provide evidence from the student and professor interviews.

Knowing each other better/ creating a feeling of connectedness was a theme that reflected both professors' and students' experiences of interacting on Facebook. As several professors reported, connections on Facebook opened up heightened opportunities for knowing student friends better as persons; through this channel, professors had access to students' interests, hobbies, and attitudes. For example, professor JWach clearly stated the benefits of Facebook interactions in terms of the mutuality of knowing and being known:

> I think people take a look at what I do [on Facebook] and vice-versa, I kind of see what some of my student friends are up to. It works well I think for both parties. And I get to know a little bit more about my students than I would ever have learned just through the classroom. (JWach, 18)

JWach felt that learning about students' lives through Facebook helped him know his student friends better. While observing "it's easier for [students] to express themselves when they are online," professor Alex underscored that students feel more comfortable sharing in an environment familiar and appealing to them. What online tools and particularly Facebook added to student-instructor interactions relates to professor Orfeo's idea that knowing students as persons cannot be forced within the boundaries of the formal interactions in the classroom.

> "Facebook? Yeah I think it enables communication. I don't think people can tell me some of the things that I think that are important just meeting at a regular lab meeting periodically or something like that, it's not the best context but alone, isolated when the thought occurs to them they have the opportunity to express it instantly almost; so I think it ended up kind of always being in the right place at the right time; or when we have

> scheduled meeting some people just can't -some people don't know how to do it (Orfeo, 42)

Orfeo emphasized that Facebook provided not only a familiar virtual space in which student-instructor relationship can develop but also the type of asynchronicity and a sense of continuous presence that stimulate communication whenever students consider it appropriate.

It is important to note that several professors (e.g., Alex, JWach) and students (e.g., Steve, Lauren) pointed out beneficial consequences of knowing each other better and enhancing student-instructor connectedness, especially when Facebook connections developed while students were enrolled in the instructor's class. Professor JWach indicated that students who became his Facebook friends tended to communicate more with him out-of-class via email or in-person and to seek his assistance with academics. Moreover, some participants indicated that the feeling of connectedness built through Facebook interactions transferred to the formal classroom interactions. For example, by using the information learned via Facebook about students' interests and hobbies (e.g., videogaming, puzzles) as an icebreaker in the classroom, professor Alex was able to create immediacy/ closeness and therefore to decrease students' anxiety in connection with learning complex mathematical concepts.

> So that's how I warm up classes very fast; if I start telling them that I play video games they relax immediately, you know, and after that you get a lot of questions about this … and it could be about the puzzles I give them… I get a lot of questions about that on Facebook … and … yeah, it could be about anything … whatever … "did you see the new Harry Potter", you know, anything (Alex, 36)

In other words, Alex tuned what he decided to disclose in the classroom (i.e., hobbies and interests) to students' interests noticed via Facebook.

In addition to helping to create immediacy and a sense of connectedness between students and instructor, Facebook interactions represented valuable sources of information for the professor regarding student motivation and group dynamics. Alex talked about students

reaching out to him on Facebook to discuss the problems they were having with staying motivated. The following excerpt shows how professor Alex described this interaction together with the teaching strategies developed to address the problem:

> Then I have another student … who sent me very honest messages in my inbox on Facebook, in which he would just explain like "look, I thought that I'm good in this class but I'm feeling overwhelmed and I don't know what to do"… and he was skipping a lot of classes, like every other class … and he said "you understand video games, make it somehow like the game for me so that I can do better in this class"… So, then I suggested some extra credit for him and I told him "look I make it like a game for you, I'll give you five extra credit points for each five consecutive classes that you don't skip". And he likes that, you know, and it works in that he did not skip any class whatsoever … so that worked (Alex, 46)

Based on the Facebook interaction described above, Alex adjusted his strategy to accommodate students' motivational needs. In addition, Alex found out through Facebook how students collaborated outside the classroom to prepare for tests and homework, information on the group dynamics that he used to design student group tasks.

For several students (Lauren, Julia, Steve), interacting with instructors on Facebook had a similar meaning, of knowing the instructor better, at a personal level. Illustrating this view, Lauren remarked "And then you can see [the instructor's] comments on it, her take on it and that sort of helps you understand her better, too, just like a person" (Lauren, 36). By allowing students access to their Facebook activity, instructors appear to student friends as individuals who perform social roles outside of class, as persons in their full humanity, which created a feeling of connectedness.

Privacy concerns - a continuum

Although professors recognized the value of knowing students better and building relationships, not all participating professors capitalized on the potential offered by Facebook interactions. For some professors, privacy concerns and the need to maintain boundaries around personal life created important constraints. Creating tensions between knowing students better

and maintaining privacy, these constraints shaped professors' interactional behaviors. These tensions had varied degrees of intensity among the participating professors. For Logan and Betty, the tension led to rejection of student-instructor connections on Facebook, while for Halley, it resulted in a selective approach for accepting student friend requests. Here is how Halley described her concerns with privacy:

> I try to set up a clear boundary between myself as a professional and my students … For me it's just much more about professionalism than it is about saying like, you know, they won't respect me or I won't have proper authority in the classroom. I'm sure that has something to do with it along the way but that's not my primary motivation; it's more a question of privacy and professionalism I think. (Halley, 22)

This excerpt illustrates some complex issues tied to private-professional boundaries that Halley aimed to enforce by restricting connections with students on Facebook. Instructor's privacy is not as much a concern for disclosure of personal information to strangers as it is a concern related to notions of professionalism, credibility, and authority in the classroom. As seen in the excerpt, Halley's principal concern was with professional credibility. In the same direction, Logan's take on private-professional boundaries was even more intransigent. Referring to student-instructor interactions on Facebook, this professor stated "I think that you are just opening the door for trouble by not having that kind of boundary in place." For Logan, privacy on Facebook was a matter of avoiding any "possibility for there to be an inappropriate action or even the perception of inappropriate action" in the relationship with students (Logan, 117). His main concerns related to privacy were ethical conduct and student fair treatment.

With a different point of view, professors Alex, JWach, and Orfeo did not view maintaining boundaries around personal life as essential to defining their interactions with students. Alex, for example, emphasized that while he was aware of privacy issues on Facebook, his strategy was to mindfully avoid sharing information that could be detrimental to his professional credibility. He pointed out:

> You should be aware if you have your students on Facebook what you want to write there. If you write "oh, it's Monday morning but I don't know if I'll be able to teach because I have a hangover" it just doesn't look good, you know [laughing]. (Alex, 72)

For Alex, the risk for privacy breach was not concerning enough to prevent him from interacting with students on Facebook.

Interestingly, limited preoccupation with boundary maintenance for professors such as Alex, JWach, and Orfeo seemed to be linked with a distinctive projection of self. In other words, being a professor was their defining identity. Their teaching self was projected into their interactions with students regardless of the medium of interaction. They were not concerned with keeping students outside of their Facebook space because they were consistently "professors" across media (f2f and online) and, therefore, they used Facebook as an extension of their teaching or mentoring role. Professors Halley and Betty, who showed preoccupation for maintaining private-professional boundaries, viewed Facebook as a space in which their professional identity was less visible. The following excerpt illustrates very well this idea:

> …but to use my personal [Facebook] profile - I do not do that… Because my Facebook presence is more personal, it's not my professional presence… So, you know, I engaged in communications and conversations with my children or with my husband on Facebook and with the people that I attend church with. (Betty, 24-28)

Betty emphasized the she did not used Facebook as an extension of her teaching or mentoring identity and therefore she did not see any purpose or need to reveal to students her personal identity.

In addition, concerns with privacy were relevant to some of the participating students. For students, privacy was a matter of separating their personal identity from the academic identity. Some students expressed concerns about sharing Facebook with their instructors. For example, Cleopatra and Melanie talked about not feeling comfortable to connect with instructors on Facebook because this site was, in their view, a personal space dedicated to interactions with

family and friends. For them, blending academic and private life was neither appropriate nor meaningful. Talking about his peers' attitudes about friending instructors, Cory pointed out:

> Students don't want professors to see their personal life like some students go to a bar, you know, drink, party, be crazy, all that; they don't want the professors to see that; … And also students are afraid that once a professor sees that, it will have a bad impact and professors don't like you … (Cory, 82)

In Cory's explanation, impression management seemed to be the principal issue related to privacy and blended audiences on Facebook. It is important to note that students who expressed concerns with privacy in connection with maintaining an appropriate image when interacting with instructors were those who did not have instructors among their Facebook friends (i.e., Melanie, Cleopatra). At the same time, students who interacted with instructors on Facebook did not share concerns with privacy and impression management. Instead, they saw value in developing closer relationships with these instructors.

Surprisingly, in the context of privacy concerns, none of the participants, professors, or students, who expressed such concerns, indicated familiarity with the options available on Facebook for privacy management. Facebook users can customize the *privacy settings* so that information from their account (e.g., posts, comments, pictures, and links) is shared with selected friends. Therefore, even when having students among their friends, professors can choose to share with them only part or none of the content they share with other Facebook friends such as family or offline friends. However, professors did not discuss this aspect during the interviews. Only one student, Steve, talked about setting up layers of privacy for his various Facebook audiences. He described having a small circle of Facebook friends with whom he shared all content and "try to be online for them all the time", while he blocked some content for other friends.

Personal/ informal interactions

Many participants, students and professors alike, emphasized that Facebook was an online tool suited for personal or informal interactions. Professors who used Facebook for student-instructor interactions as well as non-user professors agreed upon the personal feeling of Facebook communication. For example, Betty mentioned "my Facebook presence is more personal", while Orfeo talked about the time spent on Facebook as "a recreational time." Halley described that Facebook was appropriate to use only with students with whom she developed a "more informal" type of relationship such as mentor-mentee relationship. Talking about students' approaches, Alex noted "if they just want to say 'hi' or it's more personal thing they will use Facebook."

Students used similar descriptions, emphasizing "Facebook is more personal communication" (Melanie, 40). Considering Facebook inappropriate for professional communication such as student-instructor communication on academic matters, Melanie explained:

> I just think [Facebook is] for my personal life and I kind of see school like a business communication and I think that Facebook is more personal communication and I think email can be both. … I do see email to my professors more of a business communication than Facebook interaction. (Melanie, 40)

Although Melanie's attitude about the use of Facebook for student-instructor interactions was not shared by all students participants, most participants did agree on the personal/ informal feeling of Facebook communication.

It is interesting to note that participants' perceptions about the personal feeling of Facebook interactions were connected closely with the practices adopted in this environment and with their concerns with privacy. For example, Alex and JWach, professors who did not express concerns about Facebook privacy, were also the ones who did not emphasize the personal

attribute of Facebook communication. Among students, Steve alluded to the personal character of Facebook communication but his strategy about dealing with privacy issues was to manage actively the privacy settings to share content selectively.

Maintaining and building student-instructor relationships

The participants who used Facebook for student-instructor interactions shared the meaning that Facebook allowed for relationship maintenance and sometimes relationship building. In this case, relationship maintenance signified that students and instructors connect on Facebook only subsequent to face-to-face interactions. Several professors pointed out the idea of relationship maintenance. For instance, Halley mentioned that she accepted friend requests only from students whom she "developed a relationship with outside of class," indicating that extant relationship with students are further maintained and expanded through Facebook. Similarly, Orfeo felt that Facebook offered a venue for maintaining and building relationships. He explained "I see a relationship going beyond from just data logs from the laboratory and reports from the hospital" (Orfeo, 35), underscoring that student-instructor relationships are not limited to the formal environment. Later in the interview, talking about developing relationships with students, Orfeo stated "Facebook? Yeah, I think it enables communication. I don't think [students] can tell me some of the things that I think that are important just meeting at a regular lab meeting periodically or something like that" (Orfeo, 52). Thus, in Orfeo's view, Facebook interactions contribute to building relationships.

In the same direction, JWach recounted situations in which students, with whom he did not have a strong relationship offline, requested his friendship on Facebook:

> it's not always the best students, sometimes it's students that actually did not do that well and you would think they might not [laughing] wanna have any connection with me whatsoever going into the future and yet they do … (JWach, 26)

By extending the offline connections into Facebook connections, these students, perhaps, signaled that they wanted to develop relationships with the professor.

Most of the participating students indicated that they sent friend requests when they were acquainted to the instructors, later in the semester or when the semester is over. Steve explicitly stated this idea:

> You can't add [the instructors] on the first day; if they know your name and have face-to-face connections, you're a little comfortable with them, you know, saying that "hey, he's really cool teacher, he's funny", then yeah. (Steve, 88)

The emphasis on a prerequisite in-person familiarity with the instructor is visible in this excerpt. None of the participating students sent friend requests to instructors that they did not previously meet in person, in-class, or out-of-class.

EXPECTATIONS AND PRACTICES

To address the qualitative research question "How do students and instructors negotiate relationships using CMC tools?" I identified expectations and practices related to online interactions. For the purpose of this paper, I defined practices as a set of actions and behaviors performed repeatedly or "the usual way of doing something" (Webster Dictionary). Expectations are defined as beliefs or anticipations of actions and responses in specific contexts. To identify expectations and practices, initially I explored separately students' views and instructors' views revealed in interviews and later I juxtaposed the findings to identify potential similarities and mismatches. In this section, I first present expectations and practices related to email, followed by expectations, practices and rationales for Facebook interactions.

Email expectations

Unlike Facebook, which is an environment in which expectations and practices related to student-instructor interactions are "under construction," email is a ubiquitous CMC tool in higher

education, which inherently accompanies student-instructor interactions. This was evident in students and instructors expectations and practices.

Instructors' expectations: Formal communication

Some of the professors interviewed shared an expectation about students' approach to email communication. Viewing student-instructor email communication as a form of academic communication, professors expected students to use in their correspondence "proper formal written communication" (Betty, 40) as opposed to casual or informal language that sometimes characterize online exchanges (e.g., instant messaging, chat). The expectation involved the use of correct grammar, full words and sentences, appropriate initial expressions and sign offs. The expectation was so important for some of the participating professors (e.g., Betty, Halley) that when students failed to meet it, instructors put into practice strategies developed to address and correct it. Halley, for instance, explained her reaction to students' casual emails:

> Sometimes if the students write to me like that, I will respond to them in a very kind of clipped and sort of like I'll just brush a little bit because I find myself irritated. For me it feels like a lack of respect for their education, for their professor and for language communication, in general when they write like that. It's one thing to text your friends like that and it's another thing to write to your professor that way. I just feel like they should - I mean that's a boundary thing for me. (Halley, 60)

It is evident that Halley assigned complex meanings to the appearance of email communication. For her and other instructors, the form of communication played a role in defining/ enforcing student and instructor roles in academia. It can be inferred that for some instructors, student's identity is constructed in the student-instructor in-class interaction as well outside of class. Seen as a formal medium of communication email is meant to preserve clear student-instructor boundaries and to enforce statuses within academia. Extending this issue in a slightly different direction, Betty described a practice that was meant to model formal communication when needed:

> So I think that you can model … that type of behavior in a lot of different ways but I can only model it the manner in which I communicate with them … I hold them accountable, I send them an email back and say "I don't understand what it is that you're asking me to do" or "you've left out information in this message. I don't know what to do". So I make them accountable and I think that's just a way of teaching as well. (Betty, 40)

Suggesting to students that casual communication is inappropriate between students and instructors and modeling appropriate written communication are strategies employed by this professor.

Interestingly, although extremely important for some instructors, formal email communication was not relevant enough to students to be mentioned during the interviews. One student only talked explicitly about the need for an appropriate form of communication. For Melanie, student-instructor email communication was a form of "business writing" which had to follow formal requirements.

In addition, another expectation revealed by some professors regarded the value of email messages sent by students. Given that the quantity of emails received by instructors could reach overwhelming levels, some professors expected that students use email for meaningful communication. Orfeo, for instance talked about the difficulty of sorting out important emails from the trivial ones. Meaningful communication was, in his view, communication that promoted further learning beyond the course content, for both students and instructor. As an example, he described:

> And it depends on how deep the student is going into what's important to me like this correspondence about the meaning of language and the picture I use in illustration. The student took this thing and is running into lots of places with it, and getting into aspects of class I have never done in the past 'cause it's connected but too remote for the main content of class; but the student is enthuse about it and I'll have that once every couple of weeks, something parenthetical or incidental to the main theme caught their imagination. And I do encourage that; I really want them to make personal connections with the content (Orfeo, 73).

From Orfeo's perspective, when email communication goes beyond student inquiries about trivial details of the class logistics (e.g., attendance), there is potential for meaningful conversations in which students make meaning of the concepts discussed in class and expand their learning. At the opposite end, emails, in which "a student just double checks to see if I really meant [the announcement]" (Orfeo, 70) or in which students sent excuses about class attendance, were considered "frivolous", with little importance to learning.

Students' expectations: Instructor's reply

The expectations derived from students' interviews reflected the ubiquity of email in academia, in general, and in student-instructor interactions in particular. All participating students communicated with their instructors via email and, consequently, viewed email communication as the "normal" way of communicating with instructors. Student interviews revealed a unanimous expectation that students shared in connection with email communication. Given that email correspondence was perceived as part of the instructors' professional responsibility, students expected that instructors responded to their emails within a reasonable period. The expectation became explicit in Cory's interview: "And it's through [instructors'] business email address … and it's their obligation to reply" (Cory, 122). Melanie's strong feeling about instructor responsibility to reply to students ("I was kind of shocked" –Melanie 14) emerged when she recounted a negative experience in which a graduate teaching assistant ignored her emails because her email address (based on the maiden name) did not match the name under which she was enrolled as a student. Although students did not expect instant replies, most of them considered one-two (business) days as an acceptable interval for instructors to respond. While students had experiences with receiving responses from the instructors within hours, most of them settled their expectations for response to one-two days. For example, Julia

stated “with email, especially, you’re gonna have to wait about a day” (Julia, 60), whereas Steve mentioned “two days I think that was fine, I mean that’s exactly what I was hoping for” (Steve, 98). Many students acknowledged that it was not reasonable to expect instant or immediate email reply (e.g., within hours or same day) based on the assumption that instructors have multiple commitments and responsibilities. For example, Steve pointed out: “I understand my [instructors] are really busy … so two days is pretty normal, yeah” (Steve, 100), while, talking about immediate reply, Cleopatra emphasized: “I don’t think that’s very fair or reasonable” (Cleopatra, 108). Although all students interviewed agreed that one-two days is a reasonable interval for instructors to respond to their emails, some evidence indicated that students might develop different expectations based on previous experiences with specific instructors. For instance, Lauren, talking about situations in which students need real-time input from the instructors (e.g., when taking online quizzes, due assignments) explained:

> … usually professors if you send them an email if they just didn’t reply in time they are like more lenient to give an extension, which is good; so they’ll explain “okay just turn it in the next class” or something like that… So I guess, yeah, sometimes it’s a problem if you try to do an assignment and they don’t reply back soon enough to your emails. (Lauren, 24)

Therefore, Lauren suggested that in special situations she might expect a faster response from the instructor. It is very likely that students’ expectations regarding instructor’s reply developed in interaction with instructors as rules and norms were negotiated for this type of communication. In this direction, instructors’ practices corroborated students’ expectation for fast reply. Several professors explicitly talked about their practice of responding to students’ emails within one-two days or even faster. More about this practice is presented in the following sections of this chapter.

Email practices

The analysis of student and instructor interview data as well as email artifacts revealed a series of practices that instructors or students developed in connection to email communication. For the purpose of this dissertation, practices are defined as usual ways of going about Facebook interactions. The four practices described next characterize instructors' approaches, derived from both professor data and student data. In addition, I present two practices describing students' approaches.

Instructors' practices

(1) Responding to student emails: "Two days is pretty normal"

The most widely spread practice that emerged in connection with email communication was that instructors are very responsive to students' emails and in general one-two days is the common interval in which they reply. Interview data and email artifacts confirmed that students' expectation of instructor reply was met by instructors' practice. In her interviews, professor Betty mentioned: "I'm very responsive to email, usually within an hour sometimes and even on weekends" (Betty, 36), while Halley similarly explained: "If a student sends me something and … I know that I have twenty minutes … I'll [respond] really fast" (Halley, 40).

Student interviews corroborated this practice and showed that, in general, students were very satisfied with instructors' responsiveness. For example, Cleopatra mentioned that the instructor's reply "wasn't within an hour but I would definitely say within one-two days", while Julia confirmed "it's usually about a day." Melanie pointed out that sometimes, the instructors' reply was even faster: "I could email [the instructor] a question about homework and get an answer the same night." Furthermore, email artifacts provided by the participating students showed that, with a few exceptions, instructors consistently responded to students' emails within

the same day, sometimes even within hours or minutes. As an exception, Cory provided a copy of email communication that showed that the instructor responded within weeks. Yet, considering that the student requested a letter of recommendation, the interval the instructor needed to fulfill this request was reasonable.

(2) Compensating for limited face-to-face time

Another practice emerging from the professors' interviews revealed that email communication, due to its asynchronous affordances, extends learning beyond the spatial and temporal boundaries of the class. Thus, email was used as a parallel channel of communication by which learning time is made up for. In large lecture classes, in which the time for in-class student-instructor interactions is limited, instructors encouraged students to communicate via email. JWach, for instance, mentioned telling students to refrain from asking the questions that may arise in class and to email them instead, because "having a lot of questions during the class-that would just derail it" (JWach, 40). Talking about large lecture classes as well, Logan mentioned:

> …the class that I'm teaching this semester has over 140 students. … So in that context then my out of class interaction with student is limited. Certainly face-to-face is limited, and when I have interactions they are virtually all by email. (Logan, 4)

The heavy reliance of the professor on email communication with students, which can escape the time constraints of f2f communication, is visible in this excerpt. Similarly, Orfeo revealed a hybrid approach to handling students' questions:

> "If [students] come to me after class, I listen but I often answer back with an email to respond to it - and it's anything from some new idea that whatever went on in the classroom inspired or clarifying something from the classroom" (Orfeo, 6)

Orfeo maximized the potential afforded by email as an asynchronous CMC tool, to provide detailed answers to students' questions, which would have been most likely impractical in the context of limited time for f2f communication.

Although the majority of the professors interviewed preferred addressing students' questions via email, one of the participating students (Lauren) pointed out that some instructors discourage students from asking questions via email in favor of f2f interactions. The rationale behind this approach was connected to information overload, with the instructor having to sort through the mass of email received daily. In addition, students talked about particular incidents when instructors failed to respond to emails, which however, were exceptions.

(3) Engaging students in discussions in extension to the class content

An interesting practice of the instructors relates to the extension of the class material through student-instructor discussions via email. For Halley, Orfeo, and JWach engaging students in email conversations about intellectual issues that arose in connection to the class content was very important. Orfeo, for instance, talked about receiving emails from students who were enthusiastic about ideas discussed in class:

> …the student took this thing and is running into lots of places with it and getting into aspects of class I have never done in the past 'cause it's connected but too remote for the main content of the class. (Orfeo, 73)

Notably, these out-of-class online conversations can take up a lot of time, yet the professors were inclined to engage the students and invest the time needed especially when students reached into aspects of inquiry that were important to the professor. Halley articulated this point: "…depending on how interested I am in the topic and how much time I have at the moment I'll engage that student." Therefore, in some cases, email facilitates discussions on topics that inspire students and converge with instructors' interests, which can expand student learning beyond the class content.

(4) Reaching out to students - dealing with student disengagement

Although not shared by all participating professors, an interesting practice emerged from Halley's interview. Halley talked explicitly about using email to address students' disengagement within a class and to learn more about students' problems. Halley explained:

> So on occasion, I have a student in class who I noticed is not coming to class or is disengaged or doesn't turn in their work or something like that. And my policy is always to ask the student what is going on before I assume the student is lazy or a slacker or doesn't care; before I start to give out all negative perceptions of that student, I make it a kind of policy that first thing I do is to send them an email… (Halley, 28)

In Halley's experience, email can compensate for limited f2f interactions with students by providing a direct channel of communication that provides sufficient immediacy to address even the more complicated issues such as motivation and class engagement. Reaching out to students to provide needed support for disengaged students can be achieved via CMC tools and in this case, the preferred tool was email. Similarly, another professor, Alex, described his approach of dealing with student disengagement, in which Facebook was the preferred tool.

> So I approached [the students] on the Facebook messenger when I saw they were online and I talked to this guy; I told him "Look what the deal is with your grade" etcetera because I told him before to come to office hours but he didn't. So, I approached him like that and it makes a huge difference if you just say a general thing to the whole class or if you talk to someone in particular and you tell him "Look, you did not do good in this exam and I know you can do better, I know you're a smart guy, you do well in homework, so there is time to do something about it". So then it's something much more personal; so, they will change… (Alex, 44)

Alex relied on Facebook to reach out to disengaged students because, in his experience, students could be reached more easily via Facebook. Both professors were satisfied with the outcomes of approaching students online, and Halley concluded "ninety percent of the times it works really well". In both examples, the professors employed online communication (i.e., email and Facebook) as a more successful alternative to f2f interactions. Alex indicated that a previous attempt to communicate f2f with the student failed: "I told him before to come to office hours

but he didn't." Therefore, using online tools to reach out to students was not only justified by convenience for instructors but also by proven responsiveness on behalf of the students.

Students' practices

(1) Planning ahead to avoid "emergencies"

Many students talked explicitly about their lack of expectation for immediate or instant email replies from instructors. It was clear for the majority that they could not expect immediate response, even if they needed one (e.g., assignments due, technical difficulties with quizzes). Consequently, students developed practices in which "emergencies" or "last minute" requests for help from the instructors were avoided by addressing in advance issues and problems. For example, Cleopatra explained that she never experienced a situation in which she needed the instructor's immediate response because "I do things ahead which helps and I don't think …[expecting immediate reply is] very fair or reasonable" (Cleopatra, 108). In answer to my question, "What do you do when you need a fast reply?" Julia responded: "I deal with it. … if it's an emergency … it's only an emergency because you have procrastinated too long". Interestingly, she concluded: "Now maybe if every teacher had a Facebook and used it the same amount as teenagers do, I'm pretty sure I'd have my answers right away" (Julia, 60). Julia restated the lack of expectations for email instant reply, which are more appropriate for other online tools such as Facebook or instant messaging. Clearly, the participating students viewed email as an official, professional channel of communication that allows for most student-instructor interactions as long as an "emergency" does not occur.

(2) Avoiding face-to-face contact/ maintaining face

Professors and a few students alluded to a practice that students employ at times: the use of email communication to avoid face-to-face (f2f) contact when dealing with sensitive

(embarrassing) issues. The tone of professors' voices suggested that they might be discontent with students' approach. Halley described the rationales invoked most often in emails sent to avoid f2f interactions:

> I think [students] also use email to avoid having to make personal contact, sometimes. So students who are turning in a late assignment or missed class, you know- there's always the genre of the student who feels like they have to tell you in intimate detail about whatever illness is preventing them to making it to the test or something like that (Halley, 38)

The strategy that Halley noticed in her email interactions with students highlights the idea of "maintaining face" (Goffman, 1959) which explains why students compose detailed explanatory emails when the social situation (e.g., missing the class, missing the deadline) threatens to compromise the image that the instructor has formed about a student. Email as online communication in general can better serve the purpose of maintaining face than f2f interaction because facial expressions are concealed and statements can pass more easily as genuine when separated from paralanguage. Melanie, a 28-year-old returning student, who was concerned with maintaining face corroborated Halley's point of view:

> I think sometimes [students] use emails instead of a face-to-face communication to kind of get, I guess, get away with things, can't make it to class that day for a reason that is not really an excuse, you know, they might email the professor to say "hey I'm not gonna make it into class today, what am I missing?". But usually I'm missing class 'cause it's a reason like when my mom was in the hospital… (Melanie, 68)

Melanie's explanation shows that students acknowledge the practice of using email to provide explanations to the instructor. However, some students, like Melanie, emphasized that sometimes they have real emergencies and need to email instructors to excuse themselves. In those cases, they have to deal with instructors' generalized perception that such excuses are not genuine.

Providing additional information about students' use of email to avoid direct f2f confrontation, JWach described an experience in which students, getting upset with the instructor over various issues (e.g., grade), "send something [via email] and maybe later they'll regret it but

there is no way of calling it back" (JWach, 52). Further, JWach concluded: "I think some will find it easier to say something in an email that will be extremely negative than they might to my face" (JWach, 56), illustrating the idea that students, perhaps with the same intention of saving face, address sensitive issues via email rather than f2f. While instructors' reactions to such incidents may vary, JWach summarized his approach "I just try to kill it with kindness" (JWach, 52), suggesting that he attempted to solve the issue amiably and ignore the student's negative tone. Interestingly, one of the email artifacts provided by a student, Cory, illustrates an exchange in which he confronted the instructor for failing to provide feedback on his paper. Although Cory's tone did not seem aggressive or negative as JWach described, but instead distant and well thought, it is evident that the email addressed a sensitive issue. Here is how Cory explained during the interview the role of email in mitigating social awkwardness in sensitive student-instructor interactions:

> Also email can avoid unnecessary awkwardness-sometimes if you complain about grade or if you are concerned about something is not good to say that directly, in-person, and email will soften that seriousness and also give time to the professor to think and it also give us time to think what to respond. (Cory, 130)

The fact that Cory preferred to use email to address a sensitive issue during the semester shows that email allowed him to accomplish at least two goals while he confronted the instructor via asynchronous CMC: (1) reflecting about the content to be sure that he clearly stated the message and (2) saving face or mitigating social awkwardness.

Facebook expectations

Students and professors' interview data revealed that student-instructor interactions on Facebook were oriented by a set of expectations, which were different for students and instructors. I identified one professor expectation and two student expectations.

Instructors' expectation: Students should initiate the Facebook connections

The expectation that appeared relevant to professors was that students should initiate connections on Facebook, if they wanted to, by sending requests to their instructors. Their rationale was related to ethical considerations about the moral responsibility to treat students fairly. For example, Alex, who had many students among his Facebook friends, explained:

> … I don't usually add students myself; I wait for them to add me. So, you know, it would not be correct for me to add a certain student; I'll have to either add the whole class or nobody, right?! (Alex, 26)

In this excerpt, Alex emphasized that the ethical requirement of fair treatment for all students prevented him to friend students, unless requests were sent to all students in his classes. Therefore, coupled with the expectation that students should initiate the connection, one of the Facebook practices he developed was to avoid sending friend requests to students. Similarly, JWach, who had frequent Facebook interactions with students, shared this view:

> I don't try to friend students myself especially if they are currently enrolled in the class 'cause that might seem a little bit odd … But if a student is in my class or former student friends me on Facebook I've always accepted. (JWach, 6)

In this excerpt, JWach revealed that he held a similar expectation for student initiative.

While all of the participating professors had a personal Facebook account, two professors (Betty and Halley) were involved additionally in administering Facebook group pages. Betty managed a Facebook page for the student association that she was coordinating, and Halley took charge of a group page associated with a study abroad program. Interacting with students via Facebook group pages allowed the professors to adopt more formal positions in which the

expectations for student initiative were no longer applicable. As page administrators, to build community through these pages, they commonly sent students invitations to connect with the group page.

Students' expectation: Instructors should "send out a vibe"

Students seemed to hold one principal expectation, accompanied sometimes by a secondary one. Different from professors' expectation, students' principal expectation was that instructors should encourage the initiation of Facebook connections by signaling availability. What students perceived as indicators of a welcoming attitude was far from homogenous. Such indicators ranged, in students' views, from a general open attitude of the instructors towards out-of-class communication (Steve, Cory, Lauren), to hearsays from the instructor's former students (Lauren), to the instructor's explicit approval or "permission" (Melanie), and even to instructor's initiative to add students as Facebook friends (Cleopatra). For example, Steve, a student who interacted with instructors on Facebook, described the attitude that encouraged him to add his English instructor as friend on Facebook in the following terms:

> But there are teachers that send out a vibe that's saying "hey it doesn't really matter as long as - it doesn't really matter you're students, teachers, you can interact". (Steve, 80)

Next, at my prompt, Steve further described the "vibe" that gave him the impression that the instructor welcomed friendship on Facebook:

> … there are some teachers who would joke around - like my English teacher would joke around a lot but he was also very helpful. Some of those teachers, you know, you can add them… the vibe being mainly, you know, like their personality, the way- how much they want to joke around, how much they want to be serious in class I guess is one of the bigger things. (Steve, 82)

In these excerpts, Steve showed that his impression of the instructor's availability was related especially to the instructor's immediacy expressed in terms of sense of humor and cheerfulness in class and during other face-to-face interactions.

At the opposite end of the spectrum, Melanie, a student who had no connections with instructors on Facebook, expected that instructors would explicitly address the topic of interacting with students on Facebook and perhaps give students "permission" for such interaction. The following excerpt illustrates Melanie's expectation:

> I feel like if teachers wanted to communicate with us on Facebook that they would give us the same kind of permission, just like they gave their email address and their phone number and stuff like that, and office hours; they would give us permission for Facebook. (Melanie, interview, 48)

While talking about getting the instructors' permission, Melanie pointed to the need for making the norms explicit when students and instructors share the Facebook space. In her terms, instructor's "permission" could be something as simple as listing Facebook on the syllabus among other contact information. Like Melanie, Cleopatra, a first-year student, found no incentives in using Facebook to communicate with her college instructors. In her view, email and Blackboard were sufficient, especially that she did not interact with instructors beyond the class requirements.

Interestingly, Julia, who interacted on Facebook with one instructor, stood out among the participating students as someone who did not share the expectation that instructors should signal availability for Facebook interactions. This became apparent from her story about how other classmates and her repeatedly sent Facebook friend requests to their English instructor, who adamantly denied them and addressed the issue in class:

> He actually … was a cool teacher, he was funny, and friendly-but in class he'd be like "guys, you might as well quit adding me on Facebook, I'm not going to accept you, you're just wasting time". (Julia, interview, 8)

By illustrating a negative response on the instructor's part, this excerpt points out that Julia did not pay attention to signals of encouragement before trying to friend her instructor. However, an expectation that Julia seemed to hold was that younger instructors (age closer to students' age)

accepted unselectively students' friend requests. When Julia acted upon it, the expectation was not supported by instructor's behavior, who, although "only like six years older than us" (Julia, 6), denied her friend request.

The expectation that younger instructors who expressed immediacy in class by presenting themselves to students as cheerful and approachable undoubtedly accepted student friend requests was notably important to Steve and Julia who alluded to it several times during their interviews. However, the expectation was not apparent in other participants' accounts. On the contrary, students' practices as well as professor's practices revealed no dominant pattern regarding the instructor's age when interacting with students on Facebook. For example, Lauren described that the only instructor with whom she interacted on Facebook being "really open to [Facebook communication] because she was really laid back but she was older, too" (Lauren, 61). Moreover, interview data from the participating professors showed that, in some cases, professors with 30+ years of teaching experience did welcome Facebook interactions with students more than junior faculty did.

Facebook practices

During the interviews, students and professors revealed how their Facebook interactions began and developed, making visible several practices. Through deductive analysis of the interview transcripts, I derived themes/ patterns that can be categorized as Facebook practices. Two were practices specific to instructors, one characterized students' use, and one was common to students and instructors. While these practices were identified as patterns, unanimity among participants was not pursued.

Instructors' practices

There were two practices characterizing instructors' participation: (1) accepting student friend requests, and (2) performing interactions.

(1) Accepting student friend requests

This practice relates to instructors' selectiveness in accepting/ ignoring/ denying student friend requests. For some professors, this practice mirrored their expectation about student initiative described earlier, and matched their ethical perspective that students should be treated fairly by accepting friend requests from all students. Thus, in terms of accepting student friend requests, three patterns were apparent: (a) accepting requests from every student who sends one; (b) ignoring or denying every student friend request; and (c) accepting selectively friend requests.

(a) Alex and JWach, professors who were committed users of Facebook for student-instructor interactions, adopted the first approach, in which they unselectively accepted every Facebook friend request that they received from current or former students. They both shared the belief that it was unfair to add or accept as friends only selected students. JWach talked explicitly about his practice: "But if a student is in my class or former student friends me on Facebook I've always accepted" (JWach, 8).

(b) Abiding by the same ethical consideration that students should be treated equally, Logan, a biochemistry professor, had adopted at the time of the interview an opposite approach in which he denied every student friend request. Here is how he explained this approach:

> I decided that I didn't want students to be able to say "Oh, he's a friend of mine on Facebook" when somebody else might not be and they'd wondered why I'd turned them down. Well I just didn't want to get into that game. And do I have people in class who I favor over others in terms of do I like them more than others? Yeah, absolutely. Do I treat them differently? Absolutely not. (Logan, 125)

The excerpt illustrates that when equal access to interacting with the instructor on Facebook could not be guaranteed, it was preferable to deny access to everyone. His "game" metaphor alludes, perhaps, to the lack of explicitness of the norms and practices of student-instructor interactions on Facebook. Further into the interview, he clearly states his practice: "I just don't accept the offer of friendship" (Logan, 131). It should be noted that Logan's approach was most likely based on an informed decision considering that he used to accept student friend requests and to interact with students on Facebook, connections that he continued to maintain at the time of the interview. A similar practice of denying unselectively students' requests was inferred from Betty's interview. Although Betty was very active in interacting with students on the student association Facebook page, when it came to her personal Facebook profile, her approach was definite: "but to use my Facebook] personal profile- I do not do that" (Betty, 24). Betty's rationale for her practice relates to her effort to keep Facebook as a private territory, separate from her professional presence.

(c) Finally, another subgroup of instructors (Halley and Orfeo) described a practice of selectively accepting friend requests from students with whom they developed a relationship beyond the classroom. For example, for Halley, an anthropology professor, the practice was to decline undergraduate students' requests unless they were from students with whom she worked closely on research projects or study abroad activities. Privacy and separation of the personal and professional lives being essential to her, Halley made an exception for students whom she collaborated with outside of class because "the boundaries are already blurred between faculty and student friends" (Halley, 18). In the following excerpt, Halley explained what a relationship beyond the class meant to her:

> So one of my undergraduate students who I worked with very closely, she's a senior, I'm advising her thesis, we've been to Africa [study abroad program] together, so we kinda

> have a relationship that goes beyond just what we've established in the classroom. We're more of a mentor-mentee kind of relationship and more informal. So she calls me by my first name and we have, I mean we're still student and professor but it's less formal, I think, that it would be with somebody who I don't have as much familiarity with. (Halley, 20)

It is apparent that Halley perceived Facebook as a personal space that was more appropriate for informal interactions with students who she knew well.

Similarly, professor Orfeo, accepted friend requests from students who he met "outside of class anyways, you know, in the research setting or just for directed work". He further stated: "Facebook has a level of intimacy where it's appropriate to the kind of relationship I have with honor students, special students, graduate students all my career" (Orfeo, 40). While his student friend accepting practice was selective, Orfeo recognized the potential of Facebook for developing and maintaining closer relationships with students who he mentored.

In general, it looks like the practices of accepting students' friend requests were coupled for some instructors with the meanings they assigned to Facebook interactions and the way they used this medium. Alex and JWach, who seemed to view and use Facebook as an extension of their teaching presence adopted friending practices that allowed them to maximize the number of students to whom they reached out to by unselectively accepting friend requests. Perceiving Facebook as more of a private territory, Halley and Orfeo, chose to use it with selected students as an extension of their mentoring roles. The following theme reveals further practices relating to the way students and instructors performed their interactions.

(2) Performing interactions: How does it happen?

Several instructors' practices referred to the way in which Facebook interactions were performed: (a) refraining from browsing students' profiles; (b) learning about student friends through indirect as well as direct communication; and (c) posting links to articles connected to teaching and research interests.

(a) The first practice in this category relates to instructors' approach of refraining to browse student friends' profiles. Instead instructors learned about these students via the news feed feature of Facebook. This practice suggests that some instructors were concerned, perhaps, with invading students' privacy even though students had the initiative to connect in the majority of cases. By this practice, some of the participating professors worked to create some privacy boundaries even in an environment like Facebook, in which boundaries are difficult to maintain. Although this practice was not important to all participating professors, Alex explicitly talked about it:

> I don't really read so much [students'] status updates because it is strange to me; it feels a little bit like spying almost, even though they are on my list of friends. I mean, sure those things are posted [in your news feed] and you see them even you don't want to see them … but … there is a lot of stuff there that you just don't want to know really… (Alex, 36)

The same practice appeared in one of Halley's example of interactions with students on Facebook. In this example, one of her student friends was intrigued that the instructor had not looked at the pictures that she had posted on Facebook. Halley explained: "so at that point, I went looked at her Facebook page, looked at pictures" (Halley, 20), suggesting that looking at her student friend's profile was not a common approach for her.

(b) The second practice noticed was that the participating professors learned about their student friends on Facebook through both indirect and direct communication. **Indirect communication** included the *news feed* feature of the Facebook, which is the default page that Facebook users see when they log into their account. The n*ews feed* is a dynamic page whose content is ever changing as it is fed by updates of friends' activities. Activities such as status updates, posting pictures, changing profile picture, posting on friends' walls, commenting can show up into someone's news feed. Every news feed is unique in that it reflects the activities of a particular group of friends. This page is customable from two directions. First, any user has the

option to customize her own news feed by filtering the friends whose activities to be displayed or filtering the content to be displayed (e.g., picture updates only, status updates only, links updates only). The second direction consists of the friends' option to adjust the content that they want to share. Each user has options to make visible to or hide content (e.g., status updates, pictures, links) from specific friends.

Therefore, although the instructor practice was not to look specifically at student friends' profiles, some of the professors talked about getting to know these students better via the news feed. As an example, JWach described:

> I think people take a look at what I do in there and vice-versa, I kind of see what some of my student friends are up to. It works well, I think, for both parties. And I get to know a little bit more about my students than I would ever have learned just through the classroom. (JWach, 18)

It seems that for JWach, the presence of the connection itself, even without direct communication could enhance the student-instructor relationship. Two other professors, Alex and Halley, alluded to the same practice during their interviews. Moreover, one of the students, Lauren, talked extensively about understanding better what her instructor presented in class due to the information she obtained by reading the instructors' posts and comments on other people's posts.

In addition, **direct communication** with student friends was another practice among some of the participating professors. There were many examples throughout the interview and observation data that instructors and students communicate directly by various Facebook features such as wall posting, commenting on each other's posts and links, private messages, and chat. The direct communication was sometimes two-way as Alex exemplifies: "[student friends] would write a lot on my wall and I would comment on their wall and we'd make little jokes" (Alex, 36). Other times, as the student Facebook observation data showed, the direct

communication did not took off because the students did not reply to the initial message. For example, Lauren's instructor posted a link to a music video on Lauren's wall, on her birthday, but Lauren did not comment back. Julia's instructor commented on one of her status updates but the comment elicited no reply. However, these examples do not signify that students do not engage their instructor in direct communication. In both examples, the context of communication was so that a response from the student was not necessary.

(c) The third interaction practice was related to posting regularly links to online articles. With this approach, professors hoped to expose student friends to other perspectives and lines of thought and potentially engage them in communication about materials related to courses. Both professors and students talked about this practice. Professor JWach, particularly, described extensively this approach:

> Oh, one of the things that I make a conscious effort to do is to - and I've got bookmarked New York Times, Financial Times, The Economist and I check those on a daily basis and if I find sort of an interesting article that I think might pick [students'] interest either in financial management or just business in general, I'll try to link to that either through Blackboard and/or through Facebook and just throw it out there and see if some of these students might find it interesting or not. And once again, this is some sort of an extension of trying to be a good teacher and giving them some additional food for thought. (JWach, 46)

The appropriation of Facebook as an educational tool and the projection of the teaching presence within this environment are evident in this excerpt. For JWach, Facebook was yet another medium that supported his efforts of being "a good teacher"; posting links to relevant articles in economic online journals such as The Economist or Financial Times was a practice that he purposely developed. Perhaps for this reason, JWach did not seem visibly concerned (like Halley or Betty were) with privacy and boundaries maintenance while interacting with students within this environment.

Additional evidence for the instructor practice of posting links to articles relevant to class material came from a student's interview. Lauren explained:

> ...if I go on [Facebook] I can see [the instructor] posts a lot of current events, like news stories or stuff like that, that was also relevant to our class. So… it sort of helped me keep up with the class material, too, because a lot of what she talked in lectures was based on something that she saw on her Facebook friends' pages and stuff. (Lauren, 36)

This excerpt shows not only the instructor's practice but the student's reaction to this practice as well. For Lauren, having access to the instructor's links and discussions on Facebook enhanced her understanding of the class materials: "it was … almost like doing readings before class like for a lecture" (Lauren, 45).

Students' practices: Initiating Facebook connections - end of the semester versus during the semester

The interview data provided evidence about students' practices related to the initiation of Facebook connections. In presenting this practice, I derived support from both student interviews and professor interviews, capitalizing on multilevel data triangulation.

Due to expectations described in the section on Facebook expectations, in the majority of cases, students were the ones to initiate Facebook connections with instructors. The practices related to the moment when connections were initiated were not homogenous among participants. Two different patterns were noted: (a) friending instructors at the beginning of the semester, and (b) friending instructors during the semester.

(a) First, some of the participants, both students and professors, pointed out that students tended to send friend requests to instructors toward the end of the semester or after the semester (and therefore the class) is over. Given that none of the participating professors talked about postponing acceptance of student friend requests to the end of the semester, it is not clear whether this student practice is accompanied by instructors' practice to accept friend requests

when the semester is over. However, anecdotal information outside of this data collection suggests that this might be a practice among some instructors.

Evidence about this practice is derived from both student and instructor data. For example, talking about her Facebook connection with an instructor, Julia emphasized that "it was after the class when we were friends on Facebook" (Julia, 4), meaning that she friended her instructor when the formal interactions within the class setting have come to an end. Similar information comes from Steve's interview:

> As far as Facebook goes I don't really use that to interact with teachers while I am in their class 'cause … most of teachers will not let you add them while you're in class and you add them after you complete a class. (Steve, 6)

The excerpt shows that Steve felt more comfortable with connection with instructors at the end of the semester. In the same direction, professor JWach talked about the same friending practice that he observed among some of his students: "sometimes [students will] do it after the fact; a couple of people after the semester is over; and suddenly decide to friend me" (JWach, 26).

(b) A second pattern was that students friended and interacted with instructors during the semester. Some of the students (Steve, Lauren, and Julia) described explicitly that interactions on Facebook took place while they were enrolled in the instructor's class. For example, Lauren described:

> I friended [the instructor] on Facebook and if I had to miss class I would send her a Facebook message saying "Hey, sorry I had to miss class today. Did I miss anything important?" (Lauren, 36)

This quote illustrates that interacting with her instructor on Facebook was intertwined with the class activity and requirements. It should be noted that Lauren's type of interaction with her instructor on Facebook (i.e., about class-related issues) was not representative of the experiences of other participating students. Lauren used Facebook as an alternative medium to communicate with her instructor about class, while other participants have emphasized more communication

related to informal socializing. Except for Lauren and Julia, none of the participating students had Facebook interactions related to class. Some of the professors (Alex and JWach), however, reported class-related interactions on Facebook.

Another student, Julia, described a more complicated context in which she connected on Facebook with the instructor at the end of the semester but a few semesters later, she enrolled in another class with the same instructor. Thus, the second time she interacted with the instructor while being in his class. Interestingly, she remarked:

> And we still communicated on Facebook but there were … very - like strong lines between, you know - we didn't really talk that much on Facebook when I was his student as opposed to when I'm not. (Julia, 4)

This excerpt points out that the dynamics of Facebook interactions might be different when students and instructors interact on Facebook while performing student and instructor roles in the classroom.

Professors provided additional support for the practice of interacting during the semester. Alex, a Mathematics professor, was particularly proactive in using various CMC tools, including Facebook, to reach out to students. He used Facebook to get to know his students at a more personal level (e.g., their hobbies and interests outside of class, their life events), information which then he used to create a sense of comfort in class. The following excerpt illustrates his approach:

> I learn a lot from direct communication … so …they would write a lot on my wall and I would comment on their wall and we'd make little jokes … Some of it is math-related but for that they usually send private messages, while on the wall could be about anything … could be about videogames which for me is an interesting [topic] … it has always been an ice breaker topic in the class … so that's how I warm up classes very fast (Alex, 36)

Later in the interview, Alex described an online encounter that shows how he proactively used Facebook to reach out to disengaged students who were not achieving as high as they could during the semester:

> …there were these two students who were doing really bad in class… So, I approached them on the Facebook messenger when I saw they were online and I talked to this [student]; I told him … "Look, you did not do good in this exam and I know you can do better"… (Alex, 44)

Clearly, Alex's story is an example of how Facebook can be purposely used to extend the student-instructor communication outside of class and to deal with important learning issues such as student motivation and engagement.

Similarly, professor JWach described an interesting interaction, which, in addition to showing that interactions occurred during the semester, it also illustrates how face-to-face and online communication blended, allowing students to connect with the instructor.

> Once again I think some of the signs that some of things that I was doing last semester were actually working out was when students actually took a picture of themselves in the library studying for my exam and were able to post it on my Facebook site. And so, that was kind of like a pleasant surprise. And so I can sort of get feedback that way in terms of whether I'm getting across or not. And that's always very pleasant. (JWach, 42)

This excerpt should be interpreted in the context in which this professor organized informal study groups for students, where he tried to create a sense of community and comfort by providing snacks for students. The excerpt shows that students, this time in a self-organized study group, felt the need to include the instructor by communicating with him via Facebook. Considering that JWach consequently went to meet the students where they were (library), it can be inferred that Facebook interactions provided a way for maintaining and developing relationships between instructor and students.

Common practice: Lasting Facebook connections

Many participants, both students and professors, pointed out that the student-instructor Facebook connections, initiated either during the semester or at the end of the semester, did not end when the class ended. The connections continued allowing students and instructors to stay in touch beyond the boundaries of a class. JWach was one of the professors who enjoyed remaining

in contact via Facebook with his former students. He viewed Facebook as a helpful tool for relationship maintenance with former students.

> I've been lucky in that I've made a number of student friends over the years without the benefit of Facebook or Blackboard. But it's a little bit easier now that we have this. In fact some of my former student friends from years ago we sort of get together through Facebook now. (JWach, 22)

The practice of using Facebook to maintain connections with students beyond the spatial and temporal limits of the class was relevant to professor Orfeo as well. In the following excerpt, he explained what communicating with students on Facebook meant to him:

> Communicating with them is pretty much the same content as communicating with best friends and family. I think there are different layers of intimacy or layers of access. I seem to get the kind of personal information that … I feel it enables me to do a better job at mentoring and after graduation people remain as friends, stay in touch. (Orfeo, 48)

Getting to know students better as persons via Facebook beyond classroom boundaries was thus important for Orfeo in his mentoring role. Moreover, staying in touch with student friends was explicit mentioned in professor Alex's interview:

> But there are always a few [students] that, you just kind of stay friends with and keep in touch and they always keep posting and commenting on your wall, like I have students from seven years ago who still do that. (Alex, 84)

This excerpt indicates that unlike other CMC tools (e.g., Blackboard, email) that tie student-instructor interactions to a particular class, Facebook provides a space conducive to interpersonal relationship building between students and instructors.

Some of the **student data** also supported the practice of extending connections beyond the end of a class or semester. Steve recounted an interaction in which his former instructor sent a Facebook message to let him know about a movie release relevant to the content of the previous class. Julia talked extensively about several interactions with an instructor, which took place after the class was over. In these interactions, Julia needed and obtained the instructor's advice on dealing with personal issues, as well as recommendations for an assignment.

In addition to interview data, **observation of the Facebook activity** of a couple of students (Julia and Lauren) confirmed that students and instructors continue to communicate via Facebook from time to time, exchanging greetings or commenting on each other's posts. For example, during the one-month period allotted for the observation of three students' Facebook interactions, Lauren's instructor from the previous semester posted a link to a YouTube video birthday song on her Facebook wall (observation of Lauren's profile, January 29, 2011). In the same timeframe, a former instructor commented on Julia's wall post (observation of Julia's profile, March 1, 2011). Although the actual communication was not very abundant, the fact that a channel of communication remained open when students moved on to different classes or even after graduation shows the potential of online tools to facilitate mentoring beyond particular classes.

Rationales for Facebook interactions

In addition to expectations and practices, the interview data provided information on the main reasons that motivated or prevented students and instructors from interacting with each other on this social network site. Given that little is known about student-instructor interactions on Facebook and that the justification of these interactions is debatable, it is important to present reasons for interacting as well as for avoiding interactions.

Instructors' rationales for interacting with students

(1) Getting to know students better. Some professors (e.g., Alex, Orfeo, Halley) were motivated by the opportunity to learn more about students' interests and attitudes beyond the boundaries of the classroom. Based on Orfeo's explanation, knowing the students as persons could not be forced within the boundaries of formal interactions:

> I remember learning a long long time ago you can't make … [students] tell you what's important to them when *you* feel like; you have to wait for them to be ready to talk and I

> think that email and Facebook and things like that make that so much easier to have access, to have that kind of venue when they're ready or when it's on their mind; you can't wait for any special time or place to do this, you can't save it up for the random weekly meeting … (Orfeo, 75)

As Orfeo noted, the principal benefit of Facebook connection consisted in the possibility for extending the communication beyond formal interactions and making available to students a venue that they could use to reach out to the instructor whenever they had something important to share. It is important to note that on Facebook students might express ideas, accomplishments, needs that are not necessarily directly communicated to the instructor (e.g., a status update), which the instructor however can learn about by being part of this one-to-many form of communication.

(2) Reaching out to students by posting additional class-relevant content (e.g., links to relevant articles) or information about organized activities (e.g., student association events and activities; information about the study abroad program) was the rationale for several instructors (e.g., JWach, Alex, Betty-group page; Halley-group page).

(3) Facilitating mentoring. Some professors (e.g., Orfeo, Halley) used Facebook as an extension of their mentoring role, which allowed them to provide mentoring advice, via two-way communication, to students with whom they developed a closer mentor-mentee relationship. This rationale aligns with these instructors' practice of selectively accepting friend requests from those students with whom they had a relationship outside of class.

(4) Relationship maintenance was a motivator for some instructors (e.g., Orfeo, JWach, Alex). Facebook provided a space in which the student-instructor relationship could be preserved and developed beyond the temporal and spatial boundaries of a class. On Facebook unlike Blackboard, for example, the student-instructor connection is not conditioned by the student's enrollment in a particular class and in most cases, it continues after the class is over.

(5) Obtaining feedback from students about class was another rationale for interacting with students on Facebook. For example, professor JWach regarded student friend requests as signs that "something is working" in class, that "there is a connection" between him and students. Similarly, professor Alex found in Facebook interactions a valuable source of feedback about students' struggle with the class material, or students' collaboration on solving homework problems.

Instructors' rationales for avoiding connections with students

Weighing benefits and drawbacks, some instructors made the decision to avoid or limit interactions with students on Facebook. For these instructors the main rationales related to (1) privacy/ boundary maintenance; and (2) time management. Maintaining boundaries around private life by keeping students outside of their personal Facebook profile was very important to some of the participating professors (e.g., Halley, Betty), who were not willing to deal with the idea of mixing student audience with other Facebook audiences such as offline friends, family, co-workers. In addition, students (e.g., Julia, Cory) recounted experiences in which the instructors denied their friend requests due to privacy reasons. This evidence illustrates the tension between the need to connect and develop relationships with students and the need to maintain clear boundaries around private life. While connecting on Facebook can meet the former, it can compromise the latter due to collapsed contexts and audiences that characterize the Facebook environment (boyd, 2008). Another rationale apparent in the instructors' decision to avoid or limit interactions with students was time management. Interacting with students online takes time, which can be a powerful detractor especially when this activity is not officially recognized nor rewarded as part of the instructor's responsibility.

Students' rationales for interacting with instructors

For students, three principal reasons for connecting/ friending and interacting with their instructors became apparent. (1) Sometimes students connect with instructors because they are charismatic (funny and "cool" in class, showing understanding of student life, age close to students' age) and potentially open to Facebook communication. For example, Steve and Julia wanted to friend their instructors because they were young, made jokes in class and were laid-back and therefore interesting persons to know. (2) Other students connect with instructors to "stand out of the crowd", in hopes that being better known by the instructor may positively influence their performance and grade in class. For example, Lauren initiated the Facebook friendship with the assumption that the instructor will better remember who she was due to Facebook interactions. (3) In some cases, accessibility was the main rationale for friending the instructor, meaning that, from students' perspective (e.g., Lauren, Julia), some instructors responded faster on Facebook than via other online tools.

Students' rationales for avoiding connections with instructors

When students avoided becoming Facebook friends with instructors, their reasons notably related to: privacy concerns, and instructor's perceived unavailability. For example, Melanie, Cleopatra (students who did not have instructors among their Facebook friends), and Cory, talked about not feeling comfortable sharing Facebook with instructors due to privacy considerations. These students felt that their academic life private life should remain separate, as maintaining boundaries of their private space weighted more than opening another channel of communication with their instructors. For other students (e.g., Lauren, Steve, Cory), the lack of encouragement and perceived unavailability for Facebook friendship on the behalf of instructors were reasons to avoid connecting on Facebook with these instructors.

SUMMARY

In this chapter, I presented the qualitative findings of this study in three sections. First, I provided a description of the participants' uses of online tools, with the intention to sketch a general picture of the adoption of online tools for student-instructor communication. In the second section, I discussed the dominant patterns that expressed students and instructors' meanings in relation to their computer-mediated communication. In brief, students and instructors viewed emails interactions as official or formal, with an emphasis on instructors' professional responsibility to reply to students' messages. Professors' view of Blackboard pointed out to the relevance of this tool as a repository of course material. At the same time, students noted the lack of interactivity that characterizes their common use of Blackboard. Students and instructors shared four meanings of Facebook interactions: knowing each other better; privacy concerns; informal interactions; and maintaining relationships.

Intending to explain how students and instructors negotiated relationships via CMC tools, in the final section I highlighted expectations and practices that participants discussed in connection to their interactions on email and Facebook. Briefly, instructors held expectations of formal communication for email interactions, while students had expectations for response from instructors within one-two business days. The email practices identified for instructors included responding to student email within two days; compensating for limited f2f time; engaging students in communication about the class content; and dealing with student disengagement. Students adopted two main practices related to email: avoiding "emergency" emails to contact instructors, and using email to avoid f2f contact in some situations. For Facebook interactions, instructors expected that students initiate connections, while students expected that instructors signal their availability for connection with students. Instructors' Facebook practices pointed out

different approaches for accepting student friend requests; and performing interactions. Students' practices on Facebook highlighted two patterns: initiating connections with instructors during the semester versus at the beginning of the semester. In addition, a practice common to students and instructors was presented: preserving connections beyond the boundaries of a class. Finally, I discussed instructors and students' rationales for interacting or avoiding interactions on Facebook. In the next chapter, I discuss the quantitative and qualitative findings in an integrative approach and derive implications for practice and suggestions for future research.

CHAPTER 6: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

OVERVIEW OF THE CHAPTER

The purpose of this dissertation was to understand the role of computer-mediated communication (CMC) in the development of student-instructor relationships at the college level. A mixed methods triangulation design with quantitative and qualitative components was employed to address the following research questions: (1) Do computer-mediated interactions predict the student-instructor relationships, above and beyond the prediction afforded by demographic variables and face-to-face (f2f) interactions? (2) What meaning do students and instructors make of their computer-mediated communication? (3) How do students and instructors negotiate using CMC tools (i.e., email, Blackboard, and Facebook)?

This dissertation is organized in six chapters. In Chapter 1, I introduced the study outlining its purpose and the research questions. I also discussed the significance of the study, limitations, and delimitations of the research design, and I provided definitions of key terms. In Chapter 2, I reviewed relevant literature that provided background for the interpretation of the findings and I presented the theoretical frameworks. Chapter 3 detailed the methodological approach, with emphasis on data collection and analysis. In Chapter 4, I introduced the results of quantitative (survey) data analysis, while in Chapter 5 I presented the qualitative findings based on interviews, artifacts, and observations. Finally, in this chapter, using a triangulation approach, I discuss the qualitative and quantitative findings within an integrative framework. Moreover, I derive implications for practice and put forth recommendations for future research.

DISCUSSION

Frequency of interactions

Consistent with previous research on face-to-face (f2f) student-instructor interactions outside of class (Pascarella, 1981; Terenzini & Wright, 1987; Kuh & Hu, 2001; Cotten & Willson, 2006; Cox & Orehovec, 2007; Cox et al., 2010), the quantitative findings of this study revealed that students had infrequent f2f interactions with instructors. Most of the respondents interacted rarely (1-3 times a semester) or never with the instructor during the semester either f2f or online. However, because this study focused on interactions with one instructor in particular, the frequency of interactions is likely to be lower in this study compared to studies that employed aggregate measures of interaction (i.e., student interaction with instructors at the university at large) (e.g., Kuh & Hu, 2001; Kim & Sax, 2009; Cox et al., 2010).

In addition, findings showed that the frequency of online student-instructor interactions via email, Blackboard, Facebook, and instant messaging (IM) was more limited than f2f, which is very surprising considering that online tools (especially email and Blackboard) are intensively supported by the campus administration and, thus, affordable and available to college students. The qualitative findings corroborate some of the quantitative results regarding infrequent online student-instructor interactions. Thus, similar to f2f interactions, email communication was infrequent for all but one topic of communication (i.e., exams and assignments). Interview data supported these survey results in that the interviewed students mentioned that email was the main medium of communication with the instructor when having course-related questions (e.g., assignments requirements and due dates). Viewing email as an "official" tool of communication inherently built into academia, students rarely spoke of email as a convenient medium for informal and personal communication with instructors. These findings support Jones et al.'s

(2008) findings that indicated that email is used most often for student-instructor communication about course-related issues. Low frequency means of email interactions for other purposes found in this study correspond to results by Taylor et al. (2011) who reported that although email is ubiquitous on campus, students prefer to communicate face-to-face with the instructor whenever possible.

The survey participants reported very limited student-instructor Facebook interactions. At the same time, more than half of respondents indicated that they were connected on Facebook with at least one instructor. Observations of the Facebook activity of three students confirmed that, even though connections were maintained, student-instructor communication on Facebook was minimal and, when it happened, it was initiated by the instructor. These findings are consistent with the results reported by Teclehaimanot and Hickman (2011) regarding students' perceptions of appropriate student-instructor interactions on Facebook. Teclehaimanot and Hickman found that students considered less appropriate Facebook interacting behaviors such as posting, commenting, and sending messages. While perceptions of inappropriateness toward engaging the instructor in discussions on Facebook might provide an explanation, an equally reasonable explanation is that students perceive Facebook as a space dedicated to informal/ personal communication, as the qualitative findings in this study indicated. Thus, given that face-to-face communication with instructors about personal problems and concerns is, in general, less frequent than communication about other topics such as grades and assignments (Ku & Hu, 2001; Waldeck et al., 2002), it is explainable that student-instructor interactions on Facebook are limited as well. Since students who use Facebook have in general many Facebook friends (for example, the students in this sample reported an average number of friends of 674), it is likely that peer Facebook friends fulfill their need to communicate about personal problems. In support

of this explanation, observations of Facebook activity showed that the participating students engaged their peers in extensive back-and-forth communication; yet they did not engage the instructors who posted or commented on their Facebook walls. In addition, the student-instructor online interactions are likely to be shaped by the instructors' attitudes and approaches to using Facebook. As the interviewed data showed, professors adopted different approaches. Although some of them used intensively Facebook to interact with students, most often their approach did not include communication at a more personal level. For example, professor JWach adopted Facebook to post links to online resources related to his teaching discipline and to communicate with students about these materials.

Further, survey results indicated limited interaction with the instructor on Blackboard. Less than half of students (44%) reported at least one interaction during the semester via Blackboard about exams and assignments while for the other topics of communication the percentages were much lower (between 36% and 3% of students). The qualitative findings partially corroborate the finding of limited Blackboard interactions. First, all interviewed students indicated that they checked Blackboard regularly to find information for their classes and all interviewed instructors except one used Blackboard for their courses. Although this seems to contradict the survey responses, the qualitative findings added important information showing that students viewed Blackboard as a tool that did not facilitate much interaction. For them, accessing course material and receiving the instructors' posts on Blackboard were not forms of communication or interaction with the instructor. In defining their own meanings of student-instructor interaction, students focused perhaps on two-way communication, which they did not experience often on Blackboard. This perspective, which did not match professors' views of Blackboard, provides a possible interpretation of the survey responses that indicated reduced

interactions on Blackboard. It is possible that students did not report, for example, checking grades submitted on Blackboard as "interaction about grades". Other studies (Malikowski et al., 2007, Lonn & Teasley, 2009) found that instructors and students used most frequently features of course management systems that support dissemination of information to students (e.g., file sharing) and one-way communication (e.g. course announcements). Lonn and Teasley highlighted that interactive tools that allow for two-way communication (e.g., discussion boards, chat) were considered less valuable than the tools for information sharing, and therefore used in a very small proportion. Clearly, the findings of this study showed that Blackboard is not used to support community building among students and instructors, although by embedding a variety of interactive tools, it would be appropriate for such.

Moreover, very much like survey respondents, a majority of interviewed students did not use IM to communicate with instructors. Further, only one professor used IM to communicate with students. The findings are similar to Jones and Madden's (2002) results which showed that only 5% of the students in their large sample (n = 2,054) have used IM for student-instructor communication. Although students could receive real-time feedback via IM due to its synchronicity, perhaps they see a major drawback in that it requires participation at the time scheduled by the instructor.

The findings discussed in this section indicate that, for the surveyed students, the academic and social communities of the college (Tinto, 1993) are most likely separated. Student hesitation to interact on Facebook and instant messaging with instructors and the clear assignment of email and Blackboard communication for course-related (academic) issues can be interpreted as a reflection of students' work to keep separate their participation in the academic and social communities. A wide majority of students, who viewed Facebook as a space for

informal and personal communication, did not use it for student-instructor interactions. At the same time, viewing email as a formal tool of communication, students rarely used it to connect at a personal level with the instructors. It is disconcerting that, even with easy access to a wealth of online tools, students and instructors are reticent to engage each other in communication that blends social and academic matters, especially when considering that the development of closer bonds is essential to learning in communities of practice (Sfard, 1998; Wenger, 1998). When learning is viewed as a function of interacting with others and participating in learning communities (Lave & Wenger, 1991; Wegner, 1998), interactions with peers and instructors are keys to accessing the resources of the community. By not engaging in interactions with instructors out-of-class, as was found in this study, students miss important learning opportunities because, as Wenger (1998) underlined, "what students need in developing their own identities is contact with a variety of adults who are willing to invite them into their adulthood" (p. 277).

The role of online interactions in student-instructor relationships

Findings of regression analysis revealed that demographic variables (age, gender, and year of study), grade in the instructors' class, frequency and satisfaction with face-to-face interactions, and frequency and satisfaction with online interactions explained almost a third of the variability in student-instructor relationship measured as connectedness. The frequency and satisfaction with interactions via email, Blackboard, and Facebook significantly improved the prediction of student-instructor connectedness. This suggests that, although not as much as f2f interactions, online interactions contribute to students' feelings of connectedness with their instructors. In other words, the more students interact face-to-face and online and the more satisfied they are with these interactions, the more likely they are to feel more connected with the

instructor. Among the student-instructor interaction variables tested in the regression, only frequency of f2f interactions for student interest-driven communication, satisfaction with f2f interactions, and satisfaction with email interactions were significant predictors of student-instructor connectedness. However, given that the variability in the Facebook set of responses was very limited (i.e., 15 students reported interactions) the results related to the role of Facebook interactions are inconclusive and further research is needed to clarify this issue.

Although the variables related to Facebook interactions (frequency and satisfaction) were not significant predictors of the student-instructor connectedness, the qualitative findings provided more insight on this association. Thus, the qualitative findings revealed that Facebook interactions meant for some students and professors heighten opportunities to know each other better and to develop feelings of immediacy and connectedness. Research by Mazer et al. (2007; 2009) pointed to a similar direction, indicating that instructor's disclosure on Facebook was associated with higher levels of student affective learning and with increased perceptions of the instructor as caring and trustworthy, which are constructs relevant to student-instructor connectedness. Moreover, given that many students and professors viewed Facebook as a space suited for personal/informal interactions, it is reasonable to assume that when students and instructors interact frequently on Facebook they are more likely to feel more connected and develop closer relationships, although no causal relationship may be inferred from these data.

In addition, the frequency of email interactions was not a significant predictor of student-instructor connectedness. The qualitative findings might provide an explanation for these results. Thus, similar to results reported by Waldeck et al. (2002), the participating students perceived email as an official medium of communication with their instructors, as a tool that is not appropriate for informal and personal communication, which makes reasonable the interpretation

that interactions via email are not conducive to building connectedness with the instructor. These findings do not corroborate the findings presented by Jones and Madden (2002), and Yates et al. (2009), which showed that students and instructors reported that email enhanced student-instructor relationships. However, the lack of consistency may be explained by different research designs. Thus, while the previous studies elicited respondents' agreement with given statements, the present study relied on scale measurement of student-instructor relationship. At the same time, these previous studies targeted email in general, without differentiating between frequency of email interactions and satisfaction with the email communication. In this study, results also showed that the more satisfied with the email students were, the more connected with the instructor they felt.

In addition, the Blackboard interactions did not significantly predict student-instructor connectedness. Similarly, the qualitative findings indicated that the way students regularly used Blackboard was not supportive of student-instructor interactions. Students did not view activities such as accessing course materials, and reading instructor's announcements as student-instructor interactions and, perhaps consequently they did not feel that Blackboard facilitated a better connection with the instructor. Previous research on course managements systems (Malikowski et al., 2007; Lonn & Teasley, 2009, Lonn et al., 2010) illustrated a similar picture according to which these systems are used to facilitate the transmission of course-related information and materials, which creates little opportunity for the development of student-instructor relationships.

Meanings of online interactions

One of the main goals of this study was to uncover the meanings that students and professors ascribe to their out-of-class interactions facilitated by online tools. Because online tools such as email and Blackboard are mainstream companions of student-instructor

communication, and more recently, Facebook emerged as potentially relevant tool for such interactions, it is important to document how students and professors understand the roles of these online tools. The qualitative findings suggested that students and professors who were engaged in Facebook interactions viewed these interactions as facilitating ways of knowing each other better. In addition, they perceived Facebook as a tool appropriate for personal/ informal interactions. For students and professors, Facebook interactions had a "personalizing" and "humanizing" effect (Cox & Orehovec, 2007) on their relationships by allowing them to see each other as persons, to see other aspects of their identities in addition to their identities as students and instructors. Several students acknowledged that being Facebook friends with their instructors made them feel that they knew and understood better these instructors, which translated into a positive student-instructor relationship in the classroom. As Mazer et al. (2007; 2009) found, when instructors share information about themselves as persons students perceive them as trustworthy and caring and develop positive attitudes about the learning environment in the classroom. Other research on instructor self-disclosure, although not based on Facebook, showed that instructor's disclosure associated positively with students' willingness to participate in class (Golstein & Benassi, 1994). While highlighting the connection between instructor's disclosure and positive reactions from students, it is important to acknowledge that Facebook should not be considered the only space conducive to such disclosure. Although Facebook has the potential to facilitate self-disclosure between students and instructors, the beneficial effects of instructor disclosure can be attained in face-to-face interactions or via other online tools, as well. However, Facebook offers a space that makes student-instructor disclosure manageable in respect to time cost. For example, the convenient sharing of textual updates, pictures, links, and videos from one-to-many, characteristic to Facebook, is obviously more appealing in respect to time than

sharing such content with students face-to-face. In addition, what Facebook adds to the idea of online self-disclosure, compared to other online tools such as email or instant messaging, is its potential for creating a heighten sense of online presence for users (Garrison, Anderson & Archer, 2000). Due to reliance on profiles and reports of friends' activity, Facebook facilitates a sense that friends are present in the online environment even when they are physically remote.

It is also important to note that student-instructor disclosure can attain different degrees and previous research has shown that a certain balance between low and high self-disclosure has to be attained to create beneficial effects on the student-instructor relationship. In some cases instructor's self-disclosure can become detrimental to students' perception of instructor credibility and professionalism (Cayanus & Martin, 2004). Therefore, as Mazer at al. (2009) noted, instructors have to be mindful about the content of disclosure as well as about being consistent with what they disclose in class and on Facebook. Inconsistency between their teaching style, their presence in the classroom, and their presence on Facebook can trigger negative reactions on behalf of students. It is important to re-state that in this study the professors who used successfully Facebook to interact with students without concerns for privacy or negative effects on their professional credibility were those who projected a consistent identity both offline and online.

In addition, the issue of self-disclosure concerns students' behaviors as well. Similar to Hewitt and Forte's (2006) participants, some of the students interviewed for this study expressed concerns about becoming Facebook friends with instructors due to disclosure of personal information. Because Facebook friendship involves mutuality of disclosure, students also have to be mindful about the content shared on Facebook, which can potentially trigger negative instructor reactions and consequently affect the student-instructor relationship.

Corroborating Jones et al.'s (2008) results about email as the least personal medium of student-instructor interaction among several online tools, this study found that students and professors viewed email as a medium supportive of formal interactions. The survey results, showing that email communication about academics (e.g., grades, assignments) is the norm, with very little use of email for personal, informal exchanges, corroborated the qualitative findings. Given these findings, it is not surprising that students and instructors did not use email as a bridge to build and maintain relationships. Moreover, similar to what Jones et al. (2008) found, some professors interviewed in this study emphasized that students, capitalizing perhaps on the impersonal feeling of email, are more likely to utilize email to address potentially embarrassing issues such as making excuses for missing class or assignment deadlines. In connection with perceptions of email as a formal channel of communication, the findings revealed that some professors have expectations for formal written expression when students communicate with them via email. Similarly, Stephens et al. (2009) found that, when presented with very informal mail messages from students, instructors reported negative reactions, decreased perceptions of student credibility, and reluctance to respond favorably to students' requests. Perhaps Lightfoot's (2006) findings that students put more thought in composing email messages to their instructor than when communicating face-to-face with them, can be understood in this light. The findings of this study suggest that students and instructors construct and negotiate meanings, expectations, and norms related to these online interactions and that students adjust their practices according to instructors' expectations and vice versa. Therefore, when instructors express more or less explicitly their expectations for formal written expression on email, students are likely to take on the cues and perform accordingly.

Supportive of previous research (Malikowski et al., 2007; Lonn & Teasley, 2009, Lonn et al., 2010), findings on the meanings of Blackboard indicated that students did not see Blackboard as an interactive space. While professors referred to posting materials on Blackboard, sending course announcements and updates as communication, students did not view the same actions as interaction. For them the experience of Blackboard was mediated through the course artifacts. It is therefore important to remark that, especially from a student perspective, Blackboard did not appear as a tool appropriate to facilitate student-instructor relationship building. Instructors and campus administrators should reconsider/ analyze their expectations regarding the role of Blackboard. If the goal is to provide students with easy access to a repository of information, than the current adoption of Blackboard is satisfactory. However, if time and monetary resources are invested in incorporating course management systems with the idea of creating learning communities and facilitating student-instructor and peer-to-peer communication, then the results, as shown in this study, do not match such expectations .

IMPLICATIONS FOR PRACTICE

This study revealed several points that instructors and administrators should consider in relation to online student-instructor interactions. First, the use of online tools to supplement in-class and out-of-class student-instructor interactions has to be accompanied by compatible pedagogical conceptions and relational approaches. The selection of specific online tools is contingent on the instructors' purposes. When the goal is to relate to students on a more personal level, to try to know students better and to develop positive student-instructor relationships that can extend beyond the boundaries of a classroom, interactive tools that personalize the connections and foster a sense of social presence in the online environment such as Facebook should be the main choice. Conversely, when the goal is to focus on making information

accessible to students without interest for developing relationships, course management systems and group emails can supply this need. However, in practice, the distinction is not always clear and simple. Therefore, it is important that instructors consider their own willingness to disclose personal information to students and to deal with students' disclosure on Facebook. For interactions on Facebook to be successful and supportive of student-instructor relationships, instructors and students need to be mindful about the many collapsed audiences (boyd, 2008) that Facebook entails and be willing to develop strategies for managing multiple audiences such as friends, family, colleagues, and student friends.

The findings seem to point out that students do not frequently initiate face-to-face or online interactions. However, this should not be interpreted as lack of interest for such interactions. Many students participating in this study alluded to the notion that they would undoubtedly be open to connect with their instructors on Facebook had they received encouragements to do so. In initiating Facebook connections, students seem to be looking for signals of availability on behalf of instructors. At the same time, instructors should be aware that some students may not feel comfortable or interested in creating Facebook connections with instructors, for privacy and impression management reasons. Therefore, the recommendation for instructors is to signal availability that student can take up instead of initiating Facebook connections.

In dealing with the unmapped territory for student-instructor relationship performance that is Facebook, instructors could take charge of making explicit the expectations and practices they see appropriate for guiding student-instructor interactions. For example, instructors could make announcements in class about their availability for Facebook interactions, or can make explicit the intention to postpone any Facebook friend request until the end of the semester. After

the connections are initiated, instructors have the option to use the set of available privacy settings or to model a certain type of communication with students as some of the professors participating in this study have done.

For email communication, instructors should be aware of students' perceptions of email as a formal medium and encourage students to use email for academic as well as for communication on personal purposes. Meanings of online communication are negotiated in interaction between students and instructors and therefore subject to continue reformulation. Given that students are attuned to instructors' signals for what is appropriate or not in online interactions, it is possible for students to develop perceptions of email as appropriate means to express personal concerns. If instructors want to support positive relationships with students, they should take advantage of the accessibility and ubiquity of email by using it to fortify relationships.

In relation to the use of Blackboard, instructors need to be aware that potential is wasted when tools that are available and could support learning communities and student-instructor interactions such as the interactive features of Blackboard are not used accordingly. It is surprising that Blackboard which is a tool formally supported by the campus administration at the research site has not gained more use among students who are supposed to be its main the beneficiaries. Instructors should, perhaps, invest (more) effort in designing and putting into practice learning communities in which Blackboard to play a key role in affording rich contact among students and between students and instructors.

RECOMMENDATIONS FOR FUTURE RESEARCH

While this study has employed a mixed methods triangulation design with the intention to examine in-depth the phenomenon of college student-instructor online interactions from both a

quantitative and qualitative perspective, there are issues that remain to be clarified by future research. First, although quantitative data analysis in this study capitalized on an adequate sample of survey respondents (N = 320), with a very good response rate, the results on the predictive role of Facebook and instant messaging (IM) interactions in student-instructor relationships are inconclusive due to the limited number of responding students who reported such interactions. Given that the qualitative findings related to Facebook interactions suggested a possible association, additional research is called to further clarify this aspect. The survey data collection in this study targeted undergraduate students without restricting the survey to students who interact on Facebook with instructors. Perhaps such restrictive approach to data collection would provide more information on the role of student-instructor Facebook interactions.

Second, the review of literature on student-instructor interactions via Facebook revealed that previous studies relied on students' perceptions of hypothesized interactions with instructors, prompting students to think about possible interactions as opposed to actual ones. Although non-user students' attitudes are important to acknowledge, meaningful differences might exist between the attitudes of users and non-users on Facebook. The same argument stands for instant messaging. Therefore, more research is needed with participants (both students and instructors) able to report attitudes and experiences of actual interactions via Facebook or IM.

Third, the qualitative findings of this study put forth initial information about the meanings and practices that students and instructors negotiate in their online interactions. Acknowledging that the meanings and practices identified in this study are situated in the context of the research site, a large public university, and therefore not necessarily representative of what students and instructors might experience at other types of institutions (e.g., small liberal arts colleges, community colleges), I suggest that further research expands understandings of the

meanings and practices to other participants (students and instructors) in various other settings. For example, would students who interact more frequently with faculty members on small campuses have similar understandings of Facebook, email, or Blackboard interactions as the participants in this study? How would students and instructors react to codes of conduct or policies from the administration meant to regulate Facebook and email interactions? Would students and instructors at institutions that provide such guidelines, policies, regulations exhibit different practices of using Facebook and email?

Fourth, this study would be complemented by future research that examines instructors' reactions to student Facebook friends' postings of material that could be detrimental to a student's image such as unethical conduct, sexual behaviors, and drug use. Although this study did not focus on identifying this kind of reactions, some of the participating professors and students hinted to concerns related to the effect of such content on student's credibility. For example, how would the sharing of such content affect the student-instructor relationship? How would it affect the instructor's perceptions of student performance and instructor's willingness to assist the student? Previous research (Mazer et al., 2007; 2009) has already inquired into the effect of Facebook disclosure on the instructor's credibility. However, given that what is known in this area is based on data collected on hypothesized Facebook interactions in experimental settings, there is a need for investigations of the effect of genuine student-instructor Facebook interactions on the instructor's credibility. Would the effect of real Facebook interactions be different than the one reported by Mazer et al. (2007; 2009), who found positive associations between instructor disclosure and instructor's credibility?

Another area that warrants additional research is represented by studies that comparatively explore the perceptions and attitudes of instructors who are reticent to use

Facebook for student-instructor interactions, and, within a separate sample, the perceptions of professors who interact actively with students on Facebook. This approach would facilitate the understanding of differences and similarities between user and non-user instructors and would further clarify the role of Facebook in student-instructor interactions at the college level. Moreover, another related area of research is the integration of Facebook in college classes as a class requirement. Anecdotal information indicates that some instructors experiment with using Facebook within the course design to support the development of classroom learning communities. In connection with these initiatives, it would be important to explore whether formal implementations of Facebook in college courses contribute to student learning and to better and more frequent student-instructor interactions outside-of-class in this medium.

In addition, given that new CMC tools are constantly launched and adopted in the landscape of human interactions (e.g., Google+), research in this area needs to account for this constant evolution by highlighting common practices and meanings across online tools within broader categories of technology (e.g., course management systems, social networking sites). In this way specific concepts that are not brand-related can be developed.

Finally, a set of recommendations for further research includes aspects of the research design. Although the interview data provided considerable insight into the Facebook practices that students and instructors developed, a further understanding of these practices could be gained perhaps from observations of the student-instructor interactions in this environment. With observations performed on three students' Facebook activity, over a period limited to one month, this study provided a starting point for further exploration based on online observations. In addition, observations over longer periods accompanied by artifact collections of Facebook private messages and chat between students and instructor friends would allow a richer

understanding of student-instructor Facebook interactions. For example, in this study, several students and professors revealed that they had extensive communication on Facebook via private messages or the chat feature. However, the observation of the Facebook activity did not provide access to these private exchanges. In the same direction, data on dyads of students and instructors who are Facebook friends could provide additional insight into the meaning and norm negotiation when students and instructors interact on Facebook.

CONCLUSIONS

From a sociocultural perspective on learning, building positive relationships with professors and peers is essential for students' success in college. Relationships with faculty members can only develop in a supportive college environment that fosters frequent and meaningful student-instructor interactions. In addition to traditional face-to-face settings (e.g., office hours, before/ after class and hallway conversations, and organized campus events), online tools such as the ones targeted in this study are capable of supporting rich and meaningful interactions between students and instructors. However, the interactions facilitated by online tools seem to develop under a different set of circumstances, meanings, and rules than face-to-face interactions. Therefore, the adequate use of these tools hinges on the understanding of the underlying perceptions, attitudes, meanings, practices, and norms. This study revealed that students and instructors negotiate meanings and practices that differ from one online tool to another. While email, Facebook, and Blackboard have the potential to foster meaningful student-instructor communication, their use for engaging student-instructor relationships vary from student to student and instructor to instructor and most likely from institution to institution.

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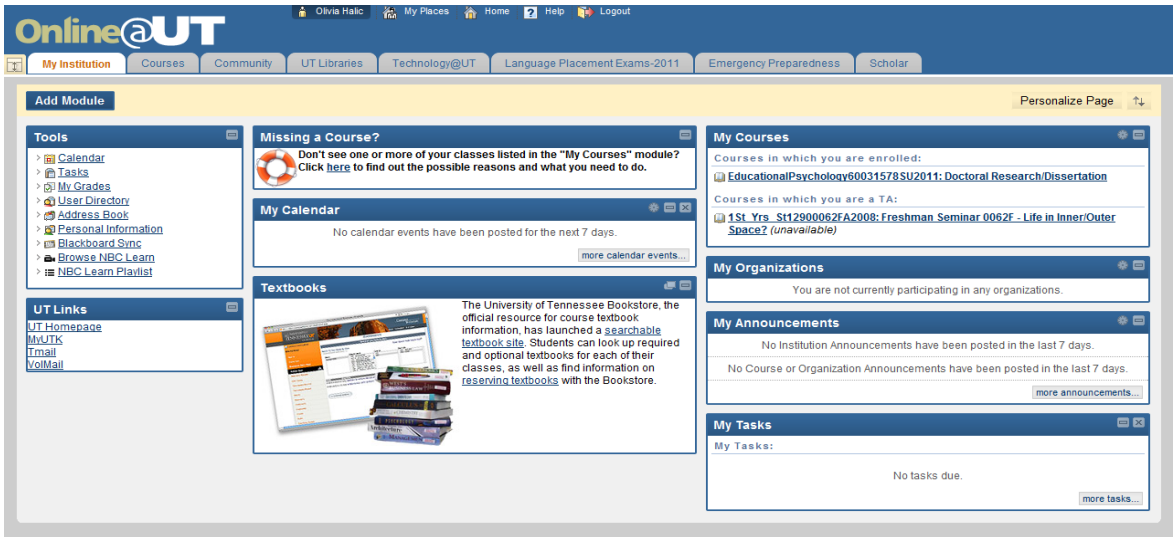
APPENDICES

Appendix A - Screen capture of Blackboard



Retrieved August 3, 2011, from http://blackboard.utk.edu/webapps/portal/frameset.jsp

Appendix B – Screen capture of Facebook

Retrieved August 3, 2011, from http://www.facebook.com/facebook

Appendix C – Survey instrument

Student-faculty interactions outside of class

Please think about the instructor with whom you have interacted the most outside of the class during the previous semester. What online tools did you use to communicate with this instructor? (Select all that apply.)

- o Email (UT email, Blackboard, Gmail, etc.)
- o Blackboard
- o Facebook (wall posts, private messages, chat)
- o Instant Messaging (AOL, GTalk, Skype, etc.)
- o Twitter
- o Blogs
- o Wikis
- o Other : _____

Please think about the same instructor with whom you have interacted the most outside of the class during the previous semester. During the previous semester, how many times have you communicated with this instructor using EMAIL (e.g., UT email, Blackboard, Gmail, Yahoo!Mail) about each of the following topics?

Answering scale/ Item	Never	Sometimes (1-3 times per semester)	Often (4-10 times)	Very often (more then 10)
Grades	1	2	3	4
Exams and assignments (e.g., homework, projects, quizzes)	1	2	3	4
Ideas from your readings or classes	1	2	3	4
Feedback on your academic performance	1	2	3	4
Your career plans (e.g., recommendation letters, graduate schools, jobs)	1	2	3	4
Activities other than coursework that you worked on with this instructor (committees, orientation, student life activities)	1	2	3	4
Research project on which you worked with this instructor	1	2	3	4
Advice on how to improve your understanding of the course material or your writing	1	2	3	4
Your course selection or academic program	1	2	3	4
Personal problems or concerns	1	2	3	4
Informal socializing (hobbies, greetings, birthday wishes)	1	2	3	4

Overall, how would you evaluate your email communication with this instructor?

- o Poor
- o Fair
- o Good
- o Excellent

Please think about the same instructor with whom you have interacted the most outside of the class during the previous semester. During the previous semester, how many times have you communicated with this instructor using FACEBOOK (wall posts, private messages, chat) about each of the following topics?

Answering scale/ Item	Never	Sometimes (1-3 times per semester)	Often (4-10 times)	Very often (more then 10)
Grades	1	2	3	4
Exams and assignments (e.g., homework, projects, quizzes)	1	2	3	4
Ideas from your readings or classes	1	2	3	4
Feedback on your academic performance	1	2	3	4
Your career plans (e.g., recommendation letters, graduate schools, jobs)	1	2	3	4
Activities other than coursework that you worked on with this instructor (committees, orientation, student life activities)	1	2	3	4
Research project on which you worked with this instructor	1	2	3	4
Advice on how to improve your understanding of the course material or your writing	1	2	3	4
Your course selection or academic program	1	2	3	4
Personal problems or concerns	1	2	3	4
Informal socializing (hobbies, greetings, birthday wishes)	1	2	3	4

Overall, how would you evaluate your communication on Facebook with this instructor?

- o Poor
- o Fair
- o Good
- o Excellent

Please think about the same instructor. During the previous semester, how many times have you communicated with this instructor using INSTANT MESSAGING (e.g.,AIM, AOL, GTalk, Yahoo!Messenger) about each of the following topics?

Answering scale/ Item	Never	Sometimes (1-3 times per semester)	Often (4-10 times)	Very often (more then 10)
Grades	1	2	3	4
Exams and assignments (e.g., homework, projects, quizzes)	1	2	3	4
Ideas from your readings or classes	1	2	3	4
Feedback on your academic performance	1	2	3	4
Your career plans (e.g., recommendation letters, graduate schools, jobs)	1	2	3	4
Activities other than coursework that you worked on with this instructor (committees, orientation, student life activities)	1	2	3	4
Research project on which you worked with this instructor	1	2	3	4
Advice on how to improve your understanding of the course material or your writing	1	2	3	4
Your course selection or academic program	1	2	3	4
Personal problems or concerns	1	2	3	4
Informal socializing (hobbies, greetings, birthday wishes)	1	2	3	4

Overall, how would you evaluate your communication on Instant Messaging with this instructor?

- o Poor
- o Fair
- o Good
- o Excellent

Please think about the same instructor. During the previous semester, how many times have you communicated with this instructor using BLACKBOARD (e.g., discussion boards, forums, course documents, digital drop box, blogs, etc.) about each of the following topics?

Answering scale/ Item	Never	Sometimes (1-3 times per semester)	Often (4-10 times)	Very often (more then 10)
Grades	1	2	3	4
Exams and assignments (e.g., homework, projects, quizzes)	1	2	3	4
Ideas from your readings or classes	1	2	3	4
Feedback on your academic performance	1	2	3	4
Your career plans (e.g., recommendation letters, graduate schools, jobs)	1	2	3	4
Activities other than coursework that you worked on with this instructor (committees, orientation, student life activities)	1	2	3	4
Research project on which you worked with this instructor	1	2	3	4
Advice on how to improve your understanding of the course material or your writing	1	2	3	4
Your course selection or academic program	1	2	3	4
Personal problems or concerns	1	2	3	4
Informal socializing (hobbies, greetings, birthday wishes)	1	2	3	4

Overall, how would you evaluate your communication on Blackboard with this instructor?

- o Poor
- o Fair
- o Good
- o Excellent

Please think about the same instructor. During the previous semester, how many times have you talked FACE-TO-FACE with this instructor, outside of the class (e.g., office hours, before/after class, in the hallways, etc.) about each of the following topics?

Answering scale/ Item	Never	Sometimes (1-3 times per semester)	Often (4-10 times)	Very often (more then 10)
Grades	1	2	3	4
Exams and assignments (e.g., homework, projects, quizzes)	1	2	3	4
Ideas from your readings or classes	1	2	3	4
Feedback on your academic performance	1	2	3	4
Your career plans (e.g., recommendation letters, graduate schools, jobs)	1	2	3	4
Activities other than coursework that you worked on with this instructor (committees, orientation, student life activities)	1	2	3	4
Research project on which you worked with this instructor	1	2	3	4
Advice on how to improve your understanding of the course material or your writing	1	2	3	4
Your course selection or academic program	1	2	3	4
Personal problems or concerns	1	2	3	4
Informal socializing (hobbies, greetings, birthday wishes)	1	2	3	4

Overall, how would you evaluate your face-to-face communication with this instructor?

- o Poor
- o Fair
- o Good
- o Excellent

Please think about the same instructor with whom you have interacted the most outside of the class during the previous semester. The following statements concern how you felt about your relationship with this instructor. Respond to each statement by indicating how much you agree or disagree with it.

Items	Answering scale
The instructor was concerned with the needs of his or her students.	Strongly Disagree (1) – Strongly Agree (7)
I was afraid that I would lose this instructor's respect.	Strongly Disagree (1) – Strongly Agree (7)
I worried a lot about my interactions with this instructor.	Strongly Disagree (1) – Strongly Agree (7)
It was not difficult for me to feel connected to this instructor.	Strongly Disagree (1) – Strongly Agree (7)
This instructor made me doubt myself.	Strongly Disagree (1) – Strongly Agree (7)
I was nervous around this instructor.	Strongly Disagree (1) – Strongly Agree (7)
I felt comfortable sharing my thoughts with this instructor.	Strongly Disagree (1) – Strongly Agree (7)
I found it relatively easy to get close to this instructor.	Strongly Disagree (1) – Strongly Agree (7)
I was very comfortable feeling connected to this instructor.	Strongly Disagree (1) – Strongly Agree (7)
I was scared to show my thoughts around this instructor; I thought he or she would think less of me.	Strongly Disagree (1) – Strongly Agree (7)
I usually discussed my problems and concerns with this instructor.	Strongly Disagree (1) – Strongly Agree (7)
I could tell this instructor just about anything.	Strongly Disagree (1) – Strongly Agree (7)
I felt comfortable depending on this instructor.	Strongly Disagree (1) – Strongly Agree (7)
I worried that I would not measure up to this instructor's standards.	Strongly Disagree (1) – Strongly Agree (7)
If I had a problem in that class, I knew I could talk to the instructor.	Strongly Disagree (1) – Strongly Agree (7)
I was afraid that if I shared my thoughts with this instructor he or she would not think very highly of me.	Strongly Disagree (1) – Strongly Agree (7)
It was easy for me to connect with this instructor.	Strongly Disagree (1) – Strongly Agree (7)
I knew this instructor could help me if I had a problem.	Strongly Disagree (1) – Strongly Agree (7)
I often worried that my instructor did not really like me.	Strongly Disagree (1) – Strongly Agree (7)

Please think about the same instructor. What has been the grade that you have received in this instructor's course?

- A
- A-
- B+
- B
- B-
- C+
- C
- C- or lower

Was the course that this instructor taught a requirement for your major (or expected major)?

- Yes
- No

During the previous semester, approximately how many instructors have you interacted with outside of the class (face-to-face or online) at least one time? [type in]

Please think about your own experience and enter your responses. How many years have you been using computers (not only for Internet access)? [type in]

How many years have you been using the Internet? [type in]

How long have you had a Facebook account?

- I do not have a Facebook account
- Less than a month
- 1 month to less than 6 months
- 6 months to less than 1 year
- 1 year to less than 3 years
- 3 years to less than 5 years
- 5 years to less than 7 years

In the past week, approximately how much time per day have you spent on Facebook?

- Less than 30 minutes
- 30 minutes to less than 1 hour
- 1 - 2 hours
- 3 - 4 hours
- 5 - 6 hours
- 7 - 8 hours
- 9 or more hours

Approximately how many friends do you have on Facebook? [type in]

Approximately how many professors/ instructors from this school year (Fall 2010 and Spring 2011) are you friends with on Facebook? [type in]

Approximately how many professors/ instructors for the previous school years are you friends with on Facebook? [type in]

How many hours do you spend online each day? [type in]

How often do you usually use the following online tools (in general, not only with instructors)? [type in]

Tool	Never	Less than once week	Once a week	A few times a week	About once a day	Several times a day	Continuously
Email							
Blackboard							
Facebook							
Instant Messaging							

Your year at the university is

- Freshman
- Sophomore
- Junior
- Senior
- Other _____

Please type in your current GPA.

Please enter your primary major or your expected major. (Enter only one.)

If applicable, enter your second major (not minor, concentration, etc.).

How many credit hours are you taking this semester?

- 6 or fewer
- 7 - 9
- 10 - 12
- 13 - 15
- 16 or more

About how many hours do you spend in a typical 7-day week preparing for class?

- Less than 1
- 1-5
- 6-10
- 11-15
- 16-20
- 21-25
- 26-30
- More than 30

Until now, what was the grade that you most frequently earned at this institution?

- A
- A-

- B+
- B
- B-
- C+
- C
- C- or lower

Your gender is

- Male
- Female

Please type in your age

Are you Hispanic or Latino?

- No, not Hispanic or Latino
- Yes, Hispanic or Latino

Please choose one category to identify yourself.

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Multiracial

If you have any additional comments or feedback that you'd like to share on your out-of-class interaction with instructors at this institution, please type them below. [type in]

Appendix D - Student-Instructor Relationship Scale

(Creasey, Jarvis & Knapcik, 2009)

Item	Answering scale						
	Disagree strongly			**Neutral/ mixed**			**Agree strongly**
Student-instructor connectedness							
The instructor was concerned with the needs of his or her students.	1	2	3	4	5	6	7
It was not difficult for me to feel connected to this instructor.	1	2	3	4	5	6	7
I felt comfortable sharing my thoughts with this instructor.	1	2	3	4	5	6	7
I found it relatively easy to get close to this instructor.	1	2	3	4	5	6	7
I was very comfortable feeling connected to this instructor.	1	2	3	4	5	6	7
I usually discussed my problems and concerns with this instructor.	1	2	3	4	5	6	7
I could tell this instructor just about anything.	1	2	3	4	5	6	7
I felt comfortable depending on this instructor.	1	2	3	4	5	6	7
If I had a problem in that class, I knew I could talk to the instructor.	1	2	3	4	5	6	7
It was easy for me to connect with this instructor.	1	2	3	4	5	6	7
I knew this instructor could help me if I had a problem.	1	2	3	4	5	6	7
Student-instructor anxiety							
I was afraid that I would lose this instructor's respect.	1	2	3	4	5	6	7
I worried a lot about my interactions with this instructor.	1	2	3	4	5	6	7
This instructor made me doubt myself.	1	2	3	4	5	6	7

I was nervous around this instructor.	1	2	3	4	5	6	7
I was scared to show my thoughts around this instructor.	1	2	3	4	5	6	7
I worried that I would not measure up to this instructor's standards.	1	2	3	4	5	6	7
I was afraid that if I shared my thoughts with this instructor.	1	2	3	4	5	6	7
I often worried that my instructor did not really like me.	1	2	3	4	5	6	7

Appendix E - Frequency of student-instructor interaction items

Item (*How many times have you communicated with the instructor about each of the following topics?)*	Answering scale			
	Never	Sometimes (1-3 times per semester)	Often (4-10 times per semester)	Very often (more than 10 times per semester)
Grades	1	2	3	4
Exams and assignments (e.g., homework, projects, quizzes)	1	2	3	4
Ideas from your readings or classes	1	2	3	4
Feedback on your academic performance	1	2	3	4
Research project on which you worked with this instructor	1	2	3	4
Advice on how to improve your understanding of the course material or your writing	1	2	3	4
Your career plans	1	2	3	4
Activities other than coursework that you worked on with this instructor (e.g., committees, orientation, student life activities)	1	2	3	4
Your course selection or academic program	1	2	3	4
Personal problems or concerns	1	2	3	4
Informal socializing (e.g., hobbies, greetings, birthday wishes)	1	2	3	4

Appendix F - Factor analysis solution for the frequency of email interactions

Item (*How many times have you communicated with the instructor about each of the following topics?)*	Factor		Communalities (h^2)
	Course-related interactions	Student interest-driven interactions	
Grades	.59		.36
Exams and assignments (e.g., homework, projects, quizzes)	.58		.34
Ideas from your readings or classes	.57		.44
Feedback on your academic performance	.67		.51
Research project on which you worked with this instructor	.43		.58
Advice on how to improve your understanding of the course material or your writing	.63		.59
Your career plans		.74	.25
Activities other than coursework that you worked on with this instructor (e.g., committees, orientation, student life activities)		.76	.46
Your course selection or academic program		.68	.57
Personal problems or concerns	.42	.32	.28
Informal socializing (e.g., hobbies, greetings, birthday wishes)		.44	.21
Eigenvalues	**4.20**	**1.48**	
Percentage of variance	**38.18**	**13.49**	

Appendix G - Factor analysis solution for the frequency of Blackboard interactions

Item (*How many times have you communicated with the instructor about each of the following topics?)*	Factor		Communalities (h^2)
	Course-related interactions	Student interest-driven interactions	
Grades	.81		.67
Exams and assignments (e.g., homework, projects, quizzes)	.83		.70
Ideas from your readings or classes	.75		.60
Feedback on your academic performance	.74		.58
Research project on which you worked with this instructor	.57		.48
Advice on how to improve your understanding of the course material or your writing	.72		.74
Your career plans		.59	.50
Activities other than coursework that you worked on with this instructor (e.g., committees, orientation, student life activities)		.77	.67
Your course selection or academic program	.51	.55	.55
Personal problems or concerns		.78	.61
Informal socializing (e.g., hobbies, greetings, birthday wishes)		.75	.56
Eigenvalues	**5.67**	**1.76**	
Percentage of variance	**51.53**	**16.02**	

VITA

Olivia Halic was born in Abrud, Romania. In 1996, she graduated from "Dimitrie Tichindeal" Pedagogical High School in Arad, Romania and started teaching at the General School No. 6 in Arad. Olivia continued teaching at this school until 2006. In 2000, Olivia graduated with a Bachelor of Laws (LL.B.) from the Western University "Vasile Goldis", Arad. In 2002, she received the National Certificate of Level 2 Teaching Proficiency from the Department of Education, Romania, while in 2006 she received the National Certificate of Level 1 Teaching Proficiency, the highest teaching credential in Romania. Between 2002 and 2006, Olivia continued her studies at the Western University of Timisoara, Romania, and, in June 2006, she graduated with a Bachelor of Arts in Pedagogy. Olivia started her doctoral studies at the University of Tennessee, Knoxville in August 2006. While in graduate school, she worked for four years as a graduate assistant in the Office of Institutional Research and Assessment at the University of Tennessee. In 2011, upon acceptance of this dissertation, Olivia will have graduated with a Ph.D. in Educational Psychology and Research from the University of Tennessee, Knoxville.