RELATIONSHIPS AMONG COLLABORATIVE LEARNING, SOCIAL PRESENCE AND STUDENT SATISFACTION IN A BLENDED LEARNING ENVIRONMENT

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ABSTRACT

RELATIONSHIPS AMONG COLLABORATIVE LEARNING, SOCIAL PRESENCE AND STUDENT SATISFACTION IN A BLENDED LEARNING ENVIRONMENT

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The Social Cognitive Framework for Blended Learning (SCFBL) is proposed as a guide for designing blended learning experiences. The components of the framework include the executive function, learning goals and objectives, learning space, learning design, interactive environment and affective results. The primary conceptual framework for this model is based on social cognitive theory (SCT) and the related theory of self-regulated learning in social settings, focusing on the study of social knowledge and the cognitive processes that occur when humans construct their own subjective reality. This approach differs from sociocultural theory in that it focuses on the individual and how the individual interacts, affects and is affected by the social environment. The SCFBL is a social influence model rather than a sociocultural model.

This study reports results of the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire for subjects from one campus in a multi-campus community college system who participated in the spring 2011 study (98 students from 11 blended courses). The CLSS questionnaire measured the amount of perceived collaborative learning, perceived social presence and reported satisfaction in a blended course. The questionnaire consisted of a section of demographic questions and then three

sections that measured the three constructs with a total of 34 questions (11 satisfaction, 8 collaborative learning, and 17 social presence). The data analysis consisted of (a) data screening (which brought the number of participants down from 108 to 99), (b) assessing for normality (which brought the number of participants down from 99 to 98), (c) descriptive analysis, and (d) correlational analysis using the Pearson Product Moment Correlation Coefficient (Pearson's r). A Mann Whitney U test was run separately on the nominal variables for Caucasian and Latino ethnicity, which found a significant, higher perception of social presence for the Latino participants. The descriptive analysis showed that the sample roughly mirrored the general population of the college. The correlational analysis resulted in the rejection of the first three null hypotheses, while the fourth was retained. The study concludes with a discussion on the implications of the results for education and blended learning, along with recommendations for future research.

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Table of Contents

List of Tables

List of Figures

DEDICATION

To my family,

who sacrificed much longer than we ever anticipated

in order to make this possible.

CHAPTER ONE

INTRODUCTION TO THE STUDY

In order to attract and retain students, education must continue to look for innovative ways to meet student learning needs as they evolve. It is in this sprit that this study is designed to explore blended learning environments and examine how they are affected by social presence, collaborative learning, and student satisfaction.

Garrison and Vaughan (2008) assert that it is "beyond time" that educational institutions recognize that they can no longer continue with traditional educational practices that do not support the needs and expectations of a knowledge society. While it has been discussed for years (Bersin, 2004; Bonk and Graham, 2006; Garrison and Vaughan, 2008), blended learning is an innovation that appears to be receiving increased interest as a method of combining the best features of face-to-face learning and online learning (Lynch, 2010). As several have pointed out, however, blended learning is not simply about adding another layer of technology to existing structures, but essentially blended learning is about transforming the structure of teaching and learning, as well as how we go about it (Garrison & Vaughan, 2008; Osguthorpe and Graham, 2003; So and Brush, 2008).

> Blended learning is no more about reshaping and enhancing the traditional classroom than it is about making e-learning more acceptable. In both contexts one is left with essentially either face-to-face or online learning. Blended learning combines the properties and possibilities of both to go beyond the capabilities of each separately. It recognizes the strengths of integrating verbal and text-based communication and creates a unique fusion of synchronous and asynchronous, direct and mediated modes of communication in that the proportion of face-to-

face and online learning activities may vary considerably (Garrison & Vaughan, 2008, p. 6).

The growth of blended learning in higher education has been anticipated for years. In a survey conducted in 2003, seven in ten respondents from higher education anticipated that more than 40 percent of their courses would be delivered in a blended format by 2013 (Bonk, Kim, & Zeng, 2006). And a meta-analysis conducted by the U.S. Department of Education suggested that interest in blended instruction continues to increase (Means, Toyama, Murphy, Bakia, and Jones, 2009). Ablrecht (2006) suggests that online learning grew rapidly because it was driven primarily by student preferences, but that blended learning is more of a pedagogically-oriented innovation with many of the advantages of online learning that could become a practice that is driven by students AND faculty. De George-Walker and Keeffe (2010) present a similar rationale in that blended learning meets student learning-needs and learning-preferences, as well as higher education organizational needs.

Several studies report increased student satisfaction with the blended model over either face-to-face or online learning environments, even though learning effectiveness appears to be roughly equal (Clusky, Hodges, & Smith, 2006). Carr (2000) and Johnson (2005) both found that students were less satisfied as the online learning portion of a course increased, leading us to believe that there may be an optimal blend for face-to-face and online modalities in some learning situations. Albrecht (2006) also reports increased student satisfaction with blended learning.

And there does appear to be advantages to blended learning over either pure face-to-face or online environments (Osguthorpe & Graham, 2003). Means, Toyama, Murphy,

Bakia, and Jones (2009) found that recent studies in which various forms of blended learning were compared with conventional face-to-face classes, blended instruction was generally more effective. Martin & Trigwell (2005) have attributed this advantage to simply the fact that the blending of instructional approaches creates an increase in learning that can be explained by variation theory. They suggest that variation theory might be useful for designing blended learning environments and instruction. As Clusky et al. (2006, p. 13) write: "A hybrid environment can be compared to a buffet. By moving the traditional lectures, supplemental materials, assignments, quizzes, and office hours online, students have a wide array of learning tools to choose from."

Blended learning in adult education appears to be especially promising. A large number of working adults are returning to school and many younger students need to work while going through school, so flexibility in the academic schedule is important. But many of these students do not have the academic preparation or technological background to be successful in a completely online environment. Blended learning provides the support and scaffolding necessary to help these students stay on track and be engaged, while offering online activities that provide flexibility and adding a rich dimension to discussions and collaboration that pure face-to-face and online environments often lack. Furthermore, as Web 2.0 technologies push learning and work increasingly into collaborative, online environments; blended learning provides adult students the opportunity to comfortably learn the skills necessary for interacting in these technology rich environments.

Blended learning offers advantages that go far beyond space maximization for institutions or convenience in work schedules, however. O'Banion (1997) describes a

learning college where instruction is learner-centered and individualized. Blended learning can create this kind of individualized learner-centered environment. Blended learning can reduce transactional distance that can exist in online courses and may exist even in a traditional face-to-face learning environment (Moore, 1993). Moore (1993) defined transactional distance as the psychological and communications space between learners and instructors. Transactional distance is relative for each learner. Blended learning can also facilitate all four of the learning interactions: learner-learner, learner-instructor, learner-content, and learner-interface (Moore & Kearsley, 1996; Hillman, Willis, & Gunawardena, 1994).

Whether face-to-face, online, or blended; learning environments will involve a complex set of factors that influence learner satisfaction and achievement (Stein & Wanstreet, 2003). This study, therefore, will examine the importance of two of the constructs believed to be important for student satisfaction in online education and evaluate whether they correlate to increased student satisfaction in blended learning courses. These constructs are perceived social presence and perceived collaborative learning.

Social presence helps learners to project themselves online and feel a sense of community. Garrison (2009) suggests that social presence occurs when learners are able to identify with a community, communicate within that community, and develop relationships by projecting their personalities. Social presence has been well documented as an important construct in online learning environments (Gunawardena, 1995; Gunawardena & Zittle, 1997; Tu, 2002; Tu & McIssac, 2002; Richardson and Swan, 2003; Liu, Gomez, Khan, & Yen, 2007).

Collaborative learning occurs when learners interact to construct common meaning and knowledge. It originates from early 20th Century sociocultural and activity theories (Vygotsky, 1978; Leontiev, 1978). The importance of learning through social interaction and collaboration has been confirmed repeatedly (Bandura, 1986; Vygotsky, 1978; Roschelle, 1992; Tu and Corry, 2003; Wenger, 1998). Tu (2004) argues that it is an essential component to creating online learning communities.

Due to the prevalence of technology and computer mediated communication in blended learning, it can be assumed that both of the constructs of social presence and collaborative learning will prove to be equally important as new, unique theories of blended learning evolve, just as they have been shown to be important in online learning.

Purpose of the Study

This study aims to contribute to the nascent theoretical framework and empirical research in the field of blended learning at the community college level. Once a conceptual framework has been established for learning-centered education using blended learning approaches, a research agenda can be followed and eventually blended courses can promote those characteristics which have been demonstrated to promote student success. A new conceptual framework is proposed in this paper which is called the Social Cognitive Framework for Blended Learning (SCFBL).

While the topics of social presence and collaborative learning have been studied in online education (Gunawardena and Zittle, 1997; Moore, 1989; So and Brush, 2008), little research has been done on how collaborative learning and social presence affect student satisfaction in a blended learning environment, especially at the community college level. If it can be demonstrated that there is a positive correlation in a blended

course between collaborative learning activities and social presence with student course satisfaction, then it would merit continuing to focus on approaches that strengthen these constructs in a blended community college environment.

Statement of the Problem

This study is designed to examine the relationships between perceived collaborative learning and social presence with student satisfaction in blended courses at one campus in a community college system.

Research Questions

1. Does perceived social presence in a blended community college course correlate with reported student satisfaction?
2. Does perceived collaborative learning in a blended community college course correlate with reported student satisfaction?
3. Does perceived social presence in a blended community college course correlate with perceived collaborative learning?
4. How do age, gender, ethnicity, computer expertise and number of distance courses previously taken correlate with perceived social presence, perceived collaborative learning, and reported course satisfaction in a blended community college course?

Research Hypotheses

H1: There will be no significant correlation between the constructs of perceived social presence and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H2: There will be no significant correlation between the constructs of perceived collaborative learning and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H3: There will be no significant correlation between the constructs of perceived social presence and perceived collaborative learning as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H4: There will be no significant correlation between student demographic data (gender, age, ethnicity, computer expertise, and number of distance courses previously taken) and the constructs of perceived social presence, perceived collaborative learning, and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire at one community college campus.

Terms Used

The terms found in this study are defined to assist readers who are not familiar with them:

Ambient Collaboration: When collaboration occurs without technology being the focus.

Blended Course: A course that uses some combination of face-to-face and computer mediated communication for collaborative learning activities and instruction, ideally approaching a 50/50 division in class time, but not to exceed 75/25 percent in either direction. This appears to be in line with the definition of blended learning provided by the community college in the study. The school's "Distance Education FAQS" (n.d.) state that a hybrid (blended) course meets at least 50% of the time on ground with the rest of

the time being online. The same FAQ defines an online course as being 80-100% online. However, the concept of a blended course is evolving as more than just a dichotomy between face-to-face and online delivery.

Blended Learning: A learner-centered approach that combines the strengths of face-to-face and computer mediated settings to optimally blend collaborative and reflective learning activities.

Blended Learning Environment: An environment in which blended learning structures and activities are facilitated.

Collaborative Learning–When learners work together to construct common meaning and knowledge.

Computer Mediated Communication: Asynchronous or synchronous communication conducted in a computer-based environment.

Convergence: A concept of collaboration theory which states that shared conceptual meaning is created through a process of learner interaction.

Immediacy: Psychological distance between communicators.

Interaction: The combined or reciprocal action of two or more people or objects that have an effect on each other. In online learning environments, interaction is often understood as learner-content, learner-instructor (and instructor to learner), learner to learner, and learner to interface interactions.

Intimacy: A communication concept that addresses how learners will adjust their behavior in online, face-to-face, or blended situations.

mLearning: A shortened form of mobile learning. Mobile learning is an approach where learning is not limited to a fixed location, but can happen anywhere through the use of mobile technology such as handheld computers, tablets and smartphones.

Learning-Centered: An approach that combines a focus on individual learners with a focus on effective learning and instructional practices.

Online Learning Community: A group of learners with shared interests who come together to collaboratively learn online.

Social Intelligence Design: An attempt to fuse three distinct realms: mind (cognition, intelligence), society (social interaction, organizations, institutions), and matter (objects, tools, technologies) by creating networks of individual minds that are able to work together in real time to create new knowledge without the limitations of space and time.

Social Presence: The ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities (Garrison, 2009).

Perceived Online Social Presence: The amount of social presence that a person detects is available online.

Student Satisfaction: An affective construct that is often considered to be a predictor of learning outcomes (LaPoint & Gunawardena, 2004). It indicates the degree of learner reaction to their learning experience in a particular course. This opinion may reflect attitudes about the content of the course, learning activities, peer learners, or the instructor.

Transactional Distance: The psychological and communication space between learners and instructors (Moore, 1993)

Abbreviations

CLE: Collaborative Learning Environment

CoI: Community of Inquiry

CMC: Computer Mediated Communication

CMS: Content Management System

CSCL: Computer-supported collaborative learning

CSM: Communication and Social Media

F2F: Face-to-face

LMS: Learning Management System

PLE: Personal Learning Environments

PLN: Personal Learning Network

SCFBL: The Social Cognitive Framework for Blended Learning

SCT: Social Cognitive Theory

SID: Social Intelligence Design

Conceptual Framework

The primary conceptual framework for this study is social cognitive theory (SCT) and the related theory of self-regulated learning in social settings. Bandura (1994) asserts that social cognitive theory focuses extensively on the social origins of thought and the ways in which social factors influence our cognitive processes. Kunda (1999) describes social cognition as a field of research that explores how our goals, desires, and feelings influence the way we remember and make sense of social events. The term broadly refers to how we use cognition, motivation and affect to make sense of our social world, and

how those interpretations often influence the way we think and behave. Fiedler and Bless (2001) explain that social cognition focuses on the study of social knowledge and the cognitive processes that are involved when humans construct their own subjective reality.

The Social Cognitive Framework for Blended Learning that is introduced in this study aims to combine the strengths of social cognitive theory, cognitive science, and some aspects of constructivism and networked learning theory into a comprehensive framework for researching and applying effective principles to blended learning. It is a learner-centered model that focuses on a highly personalized approach to learning within a larger context of social learning.

This model incorporates the construct of self-regulated learning (SRL) which involves cognitive constructs such as motivation, goal setting, self-efficacy, and the triadic model (Zimmerman, 2000, 2001; Winne and Hadwin, 1998; Pintrich; 2000). Hadwin, Wozney, and Pontin (2005) combined sociocognitive ideas about SRL with sociocultural ideas about learning to introduce a concept called coregulation, Hadwin & Oshige (2011) and Jarvela & Jarvenoja (2011) have since introduced a third dimension to the SRL continuum known as socially shared regulation of learning.

In addition to social cognitive theory, this study borrows heavily and mixes freely with sociocultural theory and networked learning theory. In fact, this blurring of the lines has been in effect for quite some time (Roschelle, 1992). Roschelle writes, “To seek progress, researchers have turned to cognitive science for theories of conceptual change. Almost all cognitive science theories entail some form of constructivism; learning is explained as the construction of representations” (pp. 267-68). Noting this similarity, but

also commenting on the fundamental difference on guided instruction, Anderson, Reder, & Simon (1998) write:

> A consensus exists within cognitive psychology that people do not record experience passively, but interpret new information with the help of prior knowledge and experience. The term "constructivism" is used in this sense in psychology, and we have been appropriately referred to as constructivists (in this sense) by mathematics educators. However, denying that information is recorded passively does not imply that students must discover their knowledge by themselves, without explicit instruction, as claimed by radical constructivists. In modern cognitive theories, all acquisition of knowledge, whether by instruction or discovery, requires active interpretation by the learner. (p. 232)

In explaining his approach to the concept of Open Teaching, Couros (2010) does not cite any single theory as his conceptual basis but rather lists social cognitive theory (SCT), social constructivism, and adult learning theory (andragogy) as complementary learning theories for his study. He adds connectivism to the mix (Siemens, 2005), which is a learning theory that is heavily influenced by social constructivism (Vygotsky, 1978), network theory (Barabási, 2002; Watts, 2004), and chaos theory (Gleick, 1987). This approach of combining learning theories is pragmatic (Johnson and Onwuegbuzie, 2004), and once freed from these rigid divisions over paradigms and learning theories, opens the door to new discoveries and more effective approaches to learning.

Limitations

This study was limited to a small rural campus located in an economically depressed section of the desert Southwest, so its findings may not be widely transferable

to other communities whose members are more privileged with a variety of options for access to technology. Also, the campus is part of a college system that is not known for being a leader in technology integration or for providing the latest technology to its students. But the college does provide all of the essential elements required for a blended classroom.

The study limits its focus to three constructs in the Social Cognitive Framework for Blended Learning (SCFBL) framework: the two independent variables of perceived collaborative learning and social presence, and the dependent variable of self-reported student satisfaction with a blended course. It then examines the relationship between them. There is likely a much richer set of factors influencing student behavior and satisfaction, so this study is a preliminary, limited look at a very small set of constructs in a very dynamic learning situation. The instrument used to measure the constructs of collaborative learning; social presence and student satisfaction may also be somewhat dated in light of the evolving fields of collaboration theory, Community of Inquiry theory, and blended learning theory.

Because the study focuses on correlation between variables, it will not prove causality. Similarly, finding a correlation between social presence or collaborative learning and student satisfaction will not allow us to state that these two variables predict student satisfaction.

Delimitations

The fact that it is a non-randomized canvass/convenience sample on one small campus in one rural community also limits its generalizability to other settings. The convenience sample size of approximately 100 participants will not provide the ability to

generalize over a large population, but it will provide the local community college an idea of where it stands as blended learning begins to take hold in the system.

Significance of the Study

If we assume that blended learning is a desirable instructional approach, for policy makers it is worthwhile to investigate constructs that improve its effectiveness at the college level. If the findings of the study show that there is correlation between social presence or collaborative learning and student satisfaction in blended learning, it should help policy makers advocate for blended learning that features these elements and better meets student needs. Data from the study should also help institutions create better programs and support services that foster more effective learning environments.

For practitioners, once these characteristics have been confirmed as having a positive correlation to student satisfaction, blended course designers and instructors can formulate strategies to help the development of social presence and collaborative learning in blended curriculum. Better understanding of the value of these constructs will allow them to design environments that help students develop the skills and aptitudes necessary to successfully complete a blended course. The results are expected to have many implications for the strategies that blended course designers can employ to improve student satisfaction, and ultimately retention, based on factors at the course level. It also would have implications for faculty development programs that teach principles of blended learning design.

Further research is warranted to determine if the constructs explored in this study go beyond a positive correlation with student satisfaction in blended learning and can be identified as predicting student satisfaction. Additional research on the effectiveness of

collaborative learning and social presence constructs in blended learning to create positive learning outcomes should also be pursued. Also, because the study focused on correlation, additional studies that attempt to predict student satisfaction based on social presence and collaborative learning should be pursued. Research using mixed methodology that goes beyond the quantitative data obtained in this study would also provide a richer and more complete understanding of the dynamics involved. Finally, research on the effectiveness of the Social Cognitive Framework for Blended Learning (SCFBL) framework as a curriculum design model should be conducted.

Organization of the Study

This study consists of five chapters. Chapter one will provide an overview of the problem, introduce the problem statement and present the research questions. Chapter two will present a review of literature and relevant research associated with collaborative learning, social presence, course satisfaction, and blended learning. Chapter three will present the methodology and procedures used for data collection and analysis. Chapter four will contain an analysis of the data and presentation of the results. Chapter five will offer a summary and discussion of the findings, implications, and recommendations for future research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Technology opens up many new possibilities for how and when we learn. But we are still struggling with how to make learning with technology more effective. Blended learning may be a concept that can help. It combines traditional methods such as lecture and collaborative learning with new methods of networked learning through social media. It uses technology, but it uses it in a way that is transparent so that the focus is on the learning and not the technology. It can be done as easily by an individual, as it can by an instructor or an institution. Finally, blended learning is more than just combining face-to-face and online learning. We must move away from this perspective and realize that this is an old paradigm that is simplistic and conceptually limiting.

In this literature review, the following sections are discussed: 1.) alternative blended learning theories and designs, 2.) a social cognitive framework for blended learning, 3.) social presence, 4.) collaborative learning, and 5.) satisfaction in blended environments. In the first section, an overview of several current models and theories of blended learning are provided in order to provide context for the study. In the second section, the author proposes a model for blended learning curriculum design based on social cognitive principles. Social cognitive theory is not very prevalent in the blended learning literature, which is currently dominated by sociocultural and connectivist perspectives. The final three sections focus on each of the constructs investigated in the study: social presence, collaborative learning and satisfaction in blended environments. The section on collaborative learning divides collaborative learning into computer-supported collaborative learning and networked learning, which have each evolved into research fields that are distinct from the overall topic of collaborative learning.

Alternative Blended Learning Theories and Designs

Blended learning has been described as the "third generation" of distance learning (Phipps & Merisotis, 1999; Francescato, Porcelli, Mebane, Cuddetta, Klobas, & Renzi, 2006). The first generation was one-way correspondence education including mail, radio and television. The second generation used a single medium, such as computer-based, online or web-based learning (So & Brush, 2008).

Blended learning is a more realistic approach to creating learner-centered instruction because it capitalizes on the strengths of each modality and provides multiple paths to deeper learning of a concept or subject. The biggest misconception about blended learning is that the goal is to simply combine face-to-face and online learning in some combination of their current forms or that it is a great way to maximize institutional space or condense a schedule (Garisson & Vaughan, 2008). While this may be true, the potential of blended learning is that we blend the strengths of each approach in order to create an entirely new approach to learning, both structurally and philosophically. Launer (2010), for example, suggests that blended learning may not even involve online learning by allowing for the possibility that it may simply be a blend of self-study and face to face study, though presumably using technology to enhance learning. Although there are many definitions for blended learning and many shades of interpretation as to what blended learning is, the definition used for this study is that it is a learner-centered approach that combines the strengths of face-to-face and computer mediated settings to optimally blend collaborative and self-reflective learning activities.

So and Brush (2008) found that a blended learning format can be a good solution for reducing transactional distance and increasing student satisfaction. Osguthorpe & Graham (2003) and So and Bush (2008) also suggest that online students prefer the chance to interact face-to-face on occasion with instructors and students when given the choice. It is about using the human connection and evolving technologies to create a new blend of learner-centered approaches that focus on individual reflection and collaborative inquiry.

When designing blended learning, the focus should be on designing for learning objectives and the activities or technologies that best support them, rather than a structure of some combination of f2f and online (Elsner, 2006). Osguthorpe & Graham (2004) propose six goals that educators might keep in mind as they design blended environments: (a) pedagogical richness, (b) access to knowledge, (c) social interaction, (d) personal agency, (e) cost effectiveness and (f) ease of revision. Osguthorpe and Graham also suggest that the blended course structure will vary depending in which of these goals are included in the design.

There are several models for blended learning design. Some of the more prevalent models will be discussed below and then we will examine how they tie into the common themes of social presence, collaborative learning, and student satisfaction. Finally, an overall sociocognitive framework for blended learning will be presented that provides a foundation for continued research and application.

The Inverted Classroom

One strategy for blended learning is known as the inverted classroom (Lage, Platt,& Treglia, 2000). In this approach, Information and Communication Technologies

(ICT) are used to deliver online readings, recorded lectures, narrated PowerPoint presentations, podcasts, and instructional videos so that learners have time for self-regulated exploration and discovery, and then time to reflect on it. Face-to-face class time is used to engage in collaborative and active learning activities (Revell & Wainwright, 2009). One benefit of this approach is that it can greatly increase social presence, learner-learner interaction and learner-instructor interaction because face-to-face time is spent in activities that encourage interaction and collaboration, rather than passively sitting in the back row during a lecture. It also reduces transactional distance in the overall course (So & Bush, 2008).

This is not to say that ICT should not be used to promote collaboration online as well. In fact, once students have had the chance to review information and reflect upon it, it is desirable to have them share their understanding with others. Stein, Wanstreet, Glazer, Engle, Harris, Johnston, et al. (2007) found that online chats give learners the opportunity to transform their personal meaning into shared solutions through a nonlinear process of asking questions, exchanging information, connecting ideas, and defending solutions. So and Brush (2008) found that learners prefer collaboration in online activities such as forums when appropriate. Hovorka, Rees and Alkilani (2010) suggest a blended learning format that combines face-to-face meetings with communication and social media (CSM) where students individually create social bookmarks and blog entries, and then engage in reflection by commenting on each other's posts.

Lage, Platt, & Treglia (2000) found that students generally prefer the inverted classroom approach to a traditional lecture. The format suggested by Lage et al. is that students read and/or review the material ahead of time and come to class prepared to

discuss it. This material may include some of the artifacts mentioned above. The instructor would start the class by asking if there were any questions over the material. This provides the students with the opportunity to interact with the instructor and request clarification or further explanation of a topic that they may have been unsure about. Student questions then generally led to a mini-lecture of ten minutes or so. If there were no questions, then there was no lecture. The students understand that if they have no questions, then this indicates to the instructor that they fully understand the material. After the lecture, the students engage in active learning and collaborative activities that allow them to explore the concepts for that week and construct deeper understandings of the material.

The Community of Inquiry Framework

A popular framework for discussing blended learning from a socioconstructivist perspective is the Community of Inquiry framework (Garrison & Vaughan, 2008; Garrison, Cleveland-Innes, & Fung, 2010). First introduced by Garrison, Anderson, and Archer (2000), this model identifies three core elements that are required to create and sustain a purposeful learning community in a collaborative constructivist learning environment (teaching, cognitive and social presence). According to Garrison, Cleveland-Innes, & Fung (2010), teaching presence provides the structure to a course which directs cognitive and social presence. Garrison et al. (2010) identify three primary responsibilities in teaching presence:

1. Establish curriculum content, learning activities, and timelines
2. Monitoring and managing purposeful collaboration and reflection

3. Ensuring that the community reaches the intended learning outcomes by diagnosing needs and providing timely information and direction (p. 32)

The importance of teaching presence to create a learning environment conducive to collaboration and reflection cannot be underestimated. Tu and Corry (2003) explain that in order to insure a good learning experience, an ideal interactive learning environment must be constructed according to a fully integrated design, rather than assembled as a collection of "unrelated, disconnected, and fragmented learning activities scattered throughout the course" (p. 54). Collaborative learning does not automatically happen. It must be planned for and maintained with a conscious, continued effort (Roschelle, 1992; Weinberger, Kollar, Dimitriadis, Mäkitalo-Siegl & Fischer, 2009)

The second core element of the Community of Inquiry framework is cognitive presence, which deals with the learning and inquiry process and is defined by the Practical Inquiry model (Garrison, Anderson, & Archer, 2001). The Practical Inquiry model has four phases of collaborative inquiry which occur in an environment of reflection and discourse: the "definition of a problem or task; exploration for relevant information/knowledge; making sense of and integrating ideas; and finally, testing plausible solutions" (Garrison et al., 2010, p. 32).

The third core element in the Community of Inquiry framework is social presence. Garrison et al believe that social presence can and should be established in online learning communities. According to the framework, it is a mediating variable between teaching presence and cognitive presence. It is the responsibility of teaching presence to create a course structure that creates social presence, which is a necessary condition for cognitive presence.

The Blended Learning Curriculum Design Model

An alternative to the Community of Inquiry design model is the Blended Learning Curriculum (BLC) model (Huang, Ma, & Zhang, 2008). This model follows a design philosophy of optimizing learning objectives by matching learning technologies to a personal learning style for just-in-time transfer of the required skills to encourage deep and situated learning. Huang et al. maintain that blended learning has three characteristics: flexibility in providing learning resources, the support of diversity in learning, and the enrichment of e-learning experiences on campus. The theoretical foundation for their blended learning model is constructivist and follows the First Principles of Instruction (Merrill, 2002). The BLC model originates from China and was designed for blended course development in larger classes. The BLC model contains the following design procedures:

1. Pre- analysis
    a. Analysis of learning characteristics: prior knowledge, learning styles, learning preferences
    b. Analysis of learning objects
    c. Analysis of blended learning environments
2. Activity and resource design
    a. Overall design of blended learning
    b. Unit (activity) design
    c. Resource design and development
3. Instructional assessment

The processes of BLC include pre-learning activities, learning activities, and assessment of outcome. The four learning components are: lead-in, planning, acting, and reviewing.

Research on Blended Learning Curriculum appears to be scant in English-language literature with the exception of a couple of articles appearing in the proceedings of the 2008 and 2009 International Conferences on Hybrid Learning, which were held in China (Huang, Ma, & Zhang, 2008; Huang & Zheng, 2009). However, since this theory originates with prominent researchers in China, there is a possibility that there is a significant amount of Chinese-language literature that was not accessible to the author at the time of this study. Both Huang, Ma, & Zhang (2008) and Huang & Zheng (2009) reported positive learning outcomes through the application of the BLC model. Even though the research on this model does not appear to be extensive, the mere fact that it is being promoted in a nation that is likely to play a dominant role in education in the 21st Century warranted its mention in this review.

Blending with Purpose: The Multimodal Model

Picciano (2009) proposes a "Blending with Purpose" multimodal model for blended learning that is designed to enhance student learning and access, improve flexibility, and address institutional needs. The conceptual foundation for this model includes blended learning technology, generations theory, personality types, learning styles, and cognitive science. By generations theory, Picciano believes that the millennial generation which is currently entering college expects technology to be thoroughly integrated into their instruction and learning. Picciano also draws from various personality and learning styles literature including multiple intelligences theory to make

the case that technology can tailor the learning experience to the unique needs and preferences of each learner. Finally, he states that cognitive science is shedding new light on how we learn and will make major contributions to learning styles literature, as well as his model presumably.

The model has six basic pedagogical objectives/activities along with suggested approaches and technologies for achieving them. Picciano states that these objectives and the related technology that supports the objectives should drive the design of the blended curriculum. This number of objectives in the multimodal model is flexible, however, and objectives can be added or removed as needed. The objectives include content, social/emotional, dialectics/questioning, reflection, collaborative learning, synthesizing, evaluating, and assessing learning, but every activity does not have to be included in every course. In other words, not every course needs to require students to do group work or engage in reflective activities if there is not a specific pedagogical reason for including them.

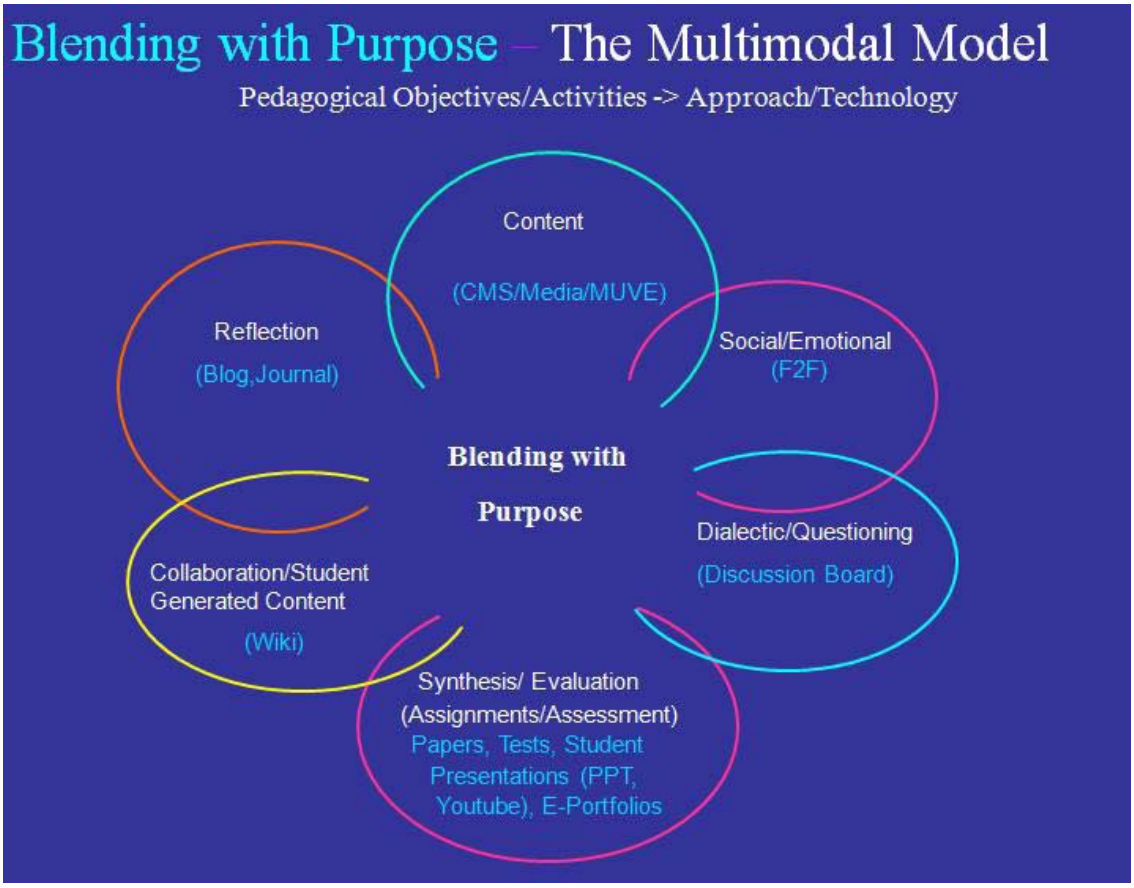

Figure 2.1. The Multimodal Model for Blending with Purpose. (Picciano, 2009)

Picianno states that content is one of the primary drivers of education and believes that there are many ways in which that content can be delivered. The Blending with Purpose model suggests that multiple technologies and media should be used to deliver content. But in discussing the next objective, Picciano explains that the Blending with Purpose model also reminds us that instruction is not just about learning content or a skill, but also about providing learners with social and emotional support. Dialectics or questioning allows the instructor to explore what students know and to help them refine their understanding of the content. The discussion board remains one of the best tools for doing this and for encouraging students to think critically about a topic or issue.

Encouraging reflection as an objective is a powerful tool for learning. Picciano points out that even though reflection is seen as a private activity, sharing reflections with others through tools such as blogs can deeply enrich learning. The collaborative learning objective focuses on many techniques such as joint publication through wikis, asynchronous communication, and face-to-face activities that build upon decades of evolution in social learning. The final objective involves synthesis, evaluation, and assessment of learning, which Picciano argues may be the most important component of the model and may consist of papers, multimedia projects, and portfolios.

Picciano's six components of the multimodal model should blend together in a way that is as seamless as possible for students. He describes this blending as more a "mixture of different colors of paint to create new colors or new learning environments than cutting and pasting visibly separate combinations of images, text, and other media or material" (Picciano, 2009, p. 13). A course does not necessarily need to include every component of the model, every time, and the learning objectives of a course should drive the activities and approaches found in the course.

Summary—Alternative Blended Learning Theories and Designs

This section provided a brief overview of some of the blended learning designs that have been proposed in the last decade. There are several models for blended learning. This section focused on a few models that have appeared in literature in recent years. The inverted classroom model focuses on providing the "transmission" of knowledge activities online while concentrating on collaboration in the face-to-face sessions. The Community of Inquiry model presents a socioconstructivist perspective that consists of three elements: teaching presence, cognitive presence, and social presence. The Blended

Learning Curriculum (BLC) is a model proposed by Chinese researchers, which also has a constructivist orientation and follows Merrill's (2002) First Principles of Instruction. The Blending with Purpose: Multimodal Model was developed by Picciano (2009) with six primary learning activity components and a conceptual foundation in generations theory, personality types, learning styles, and cognitive science.

All of these models have added to the field, but they do not provide an overall approach to blended learning from a cognitive perspective that provides both a conceptual foundation for research, as well as a practical methodology for application. Let's take a look now at a the proposed framework called the Social Cognitive Framework for Blended Learning.

A Social Cognitive Framework for Blended Learning

The Social Cognitive Framework for Blended Learning (SCFBL) aims to combine the strengths of social cognitive theory, cognitive science, and some aspects of constructivism and networked learning theory into a comprehensive framework for researching and applying effective principles to blended learning. It is a learner-centered model that focuses on a highly personalized approach to learning within a larger context of social learning. It draws from the advantages of blended learning in that it can be tailored to each user's individual interests while providing a rich, affective learning environment consisting of collaboration, reflection and discourse.

Executive Function

The structure of a learning environment has to be designed starting with the learning goals and objectives in mind. This activity is similar to teaching presence in the Communities of Inquiry model. However, in the SCFBL model it is referred to as the executive function. This is because "teaching presence" suggests that someone else is

responsible for setting up our learning environment. The focus in SCFBL is on planning for learning rather than on who is doing it. The executive function can be carried out by an instructor or trainer (guided instruction), a facilitator (coregulation), through a group or social network (socially shared regulation), or the self-directed learner (self-regulation). There is no one correct way to do this, however. Different situations call for different approaches to planning for learning.

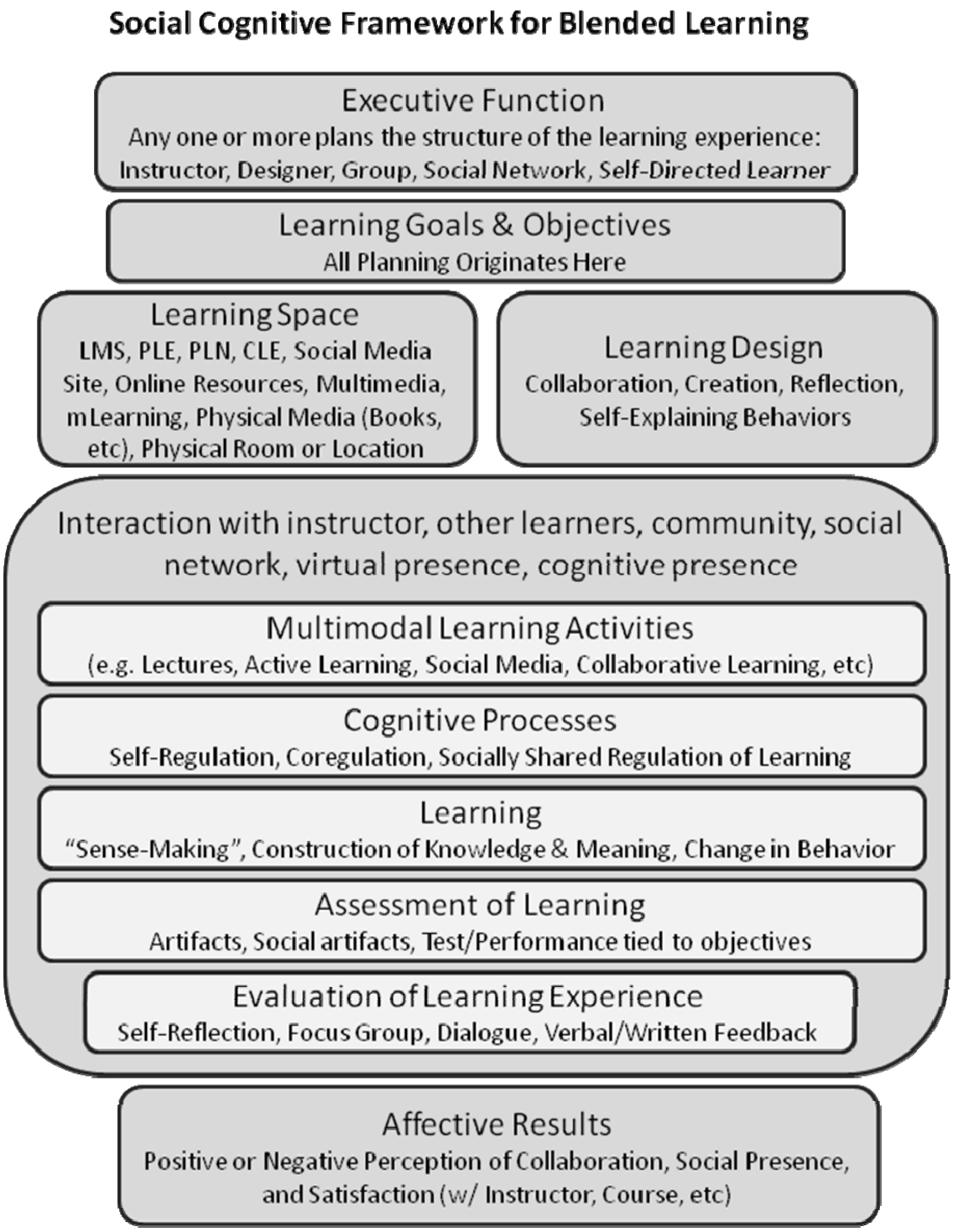

Figure 2.2. Proposed Social-Cognitive Framework for Blended Learning.

Learning Space

In blended learning, we often think of the only two options as an LMS or a physical classroom. But the learning space can be any physical, virtual, or cognitive space designed to host and facilitate the learning experience. It can include a classroom, an LMS, a social network, a personal learning environment, or any combination of these and/or other types of learning spaces. As learning spaces are incorporated that use various types of multimedia, designers may want to be aware of some of the cognitive guidelines on how to design multimedia following Mayer's (2001) Cognitive Theory of Multimedia Learning (Sorden, 2005; in press).

One of the more interesting recent innovations in learning spaces is the concept of the Personal Learning Environment (PLE). The PLE is receiving increased attention due to a convergence of several factors: social media, interest in learner-centered approaches, acceptance of informal learning; and the new ability to use technology to personalize learning to a very high degree. Because of these factors, PLEs are especially well-suited to blended learning environments.

Another learning space that looms large on the horizon is mobile learning, or mLearning. Educators have recognized the learning potential of handheld and mobile technology for quite some time (Tu, 2005). Wireless access is common and most students now carry some form of handheld mobile technology (smartphones, netbooks and tablets). As a result, the potential to use handheld computers as a viable learning space is huge (Norris & Soloway, 2008).

As we begin to experiment with some of these options, we will discover that there are dozens of possibilities and combinations beyond a simplistic joining of online and f2f

environments. Gradually, blended learning will become more a function of learning design than learning space.

Learning Design

Learning activities should be designed according to the planned objectives of the learning experience. These activities can be designed to encourage any combination of collaboration, creation, reflection, or self-explaining behaviors (Chi, Bassok, Lewis, Reimann & Glaser, 1989; Chi, De Leeuw, Chiu, & LaVancher, 1994). The first step in blended learning design would be to determine whether a particular objective calls for collaboration, reflection, etc. Only after this has been determined, can the correct learning method be selected.

The ability to personalize learning on a massive scale is a recent technological innovation that is just starting to become a viable option. Duval and Hodgins (2008) call the phenomenon of mass personalization the Snowflake Effect. By this they mean that consumers are coming to expect personalization in all areas of their life. As these technologies become widespread, learners will begin to expect personalization in their learning experiences as well. Learners will soon demand that their learning experience is tailored just to them in the same way that other aspects of their lives have become personalized to their own unique tastes and preferences.

The choices of what and how to blend will likely be exercised increasingly by the learners, rather than the instructors or course designers. De George-Walker and Keeffe, (2010) refer to this as self-determined blended learning and called for more of a focus on learner-centered blended learning designs. The goal will be to help learners to become

reflective, self-directed, self-regulating, and self-determined learners. Christensen, Horn, & Johnson (2007) predict that as tools become easier to use, mass collaboration mentioned above will allow an explosion of inexpensive and free learning material to be produced that will provide the content for personalized learning, possibly through PLEs and other personalized learning spaces.

Interactive Environment

Once the executive function has planned for the learning goals and objectives, the learning space, and the learning design; it is time to set up the interactive environment in which social presence and collaboration will develop. Social presence is the affective quality of the environment. Garrison, Cleveland-Innes, & Fung (2010) found evidence for causal connections between planning for learning and cognitive presence, with social presence being the mediating factor, or context, for this process to occur.

Most people now agree that we learn socially and research has shown over the years that perceived social presence is a critical factor for learning in any situation. The more learners interact, the greater the level of social presence. And the more learners perceive social presence, the better the affective learning experience.

So and Brush (2008) found that emotional support is needed to reduce the learners' sense of transactional distance. Russo and Benson (2005) also suggest that learner-learner interaction provides critical social and academic support. After a period of reflection, it is important to have the ability to engage with the instructor or other students to exchange ideas, to solicit feedback, and to test one's understanding of a topic. Tu and Corry (2003) explain that by encouraging learners to seek support from peers, assignments often become social exercises which can enhance learning performance.

Multimodal Learning Activities

In order to create this interactive environment, the learning design must encourage a number of multimodal learning activities which include a range of traditional, active learning, and social networking approaches. Picciano's (2009) Multimodal Model is a good place to begin with ways to structure a blended environment. So and Brush (2008) also suggest that in addition to individual assignments, designers should include at least one or two collaborative projects. These projects could be set up in a variety of learning spaces and might consist of authentic and problem-based activities to help students understand the relevance and connect meaning to what they are learning. The online environment might include both synchronous and asynchronous tools to minimize communication barriers. The design of the blended course might also include a variety of 'get-to-know' activities to increase the initial level of social presence. Instructors and designers should also plan to model and scaffold social presence behaviors for students who need this support. Finally, blended learning design should try to incorporate interesting hooks to outside information which invites further reflection and exploration of a topic.

Tu and Corry (2003) suggest several good methods for creating collaborative environments, including team projects and final projects that are posted online for peer review. Chickering and Gamson's (1987) seven principles for good practice also apply to blended learning design just as they have to online and face-to-face course design for more than twenty years (Babb, Stewart & Johnson, 2010). Focused on individual learning through computers, Moreno & Mayer (2007) explored the interaction between learner and computer interface. Also describing it as a multimodal learning environment, they

found empirical support for five categories of recommended learning activities: guided activity, reflection, feedback, learner control, and pretraining.

Cognitive Processes

The social cognitive construct of self-regulated learning (SRL) has grown in importance in recent years (Boekaerts & Cascallar, 2006). SRL is related to the concept of metacognition (Ashcraft, 2006), but extends beyond metacognition to study how cognitive concepts such as motivation, goal setting, self-efficacy, and the triadic model influence our efforts to learn. Several theories regarding SRL have been developed over the years (Zimmerman, 2000, 2001; Winne and Hadwin, 1998; Pintrich; 2000). These models have received a great deal of research attention because it is believed that individuals who can effectively plan, monitor, and control their learning are most able to be successful. Tu and Corry (2003) echo similar sentiments in that "instructors should transfer the accountability for learning to learners and provide them with opportunities to negotiate when, where, how, and what they learn" (p. 58).

Hadwin, Wozney, and Pontin (2005) combine sociocognitive ideas about SRL with sociocultural ideas about learning to introduce a concept called coregulation, which is an emergent process in interaction. Hadwin et al. postulated that individuals learn to engage and control their own self-regulatory strategies through dialogue and interaction with a supportive other. McCaslin's (2009) model of coregulation suggests that personal, cultural, and social influences together coregulate identity.

Hadwin & Oshige (2011) and Jarvela & Jarvenoja (2011) have since introduced a third dimension to the SRL continuum known as socially shared regulation of learning. Hadwin & Oshige distinguish between self-regulated learning, coregulated learning, and socially shared regulation in the following ways: Self-regulated learning is "the process

of becoming a strategic learner by actively monitoring and regulating metacognitive, motivational, and behavioral aspects of one's own learning" (p. 258). Coregulated learning involves "transitional processes in a learner's acquisition of SRL, during which members of a community share a common problem-solving plane, and SRL is gradually appropriated in response to and directed toward social and cultural contexts" (p. 258). Socially shared regulation of learning involves "processes by which multiple others regulate their collective activity. From this perspective, goals and standards are co-constructed, and the desired product is socially shared cognition" (p. 258).

Table 2.1.
Comparison of Different Perspectives of Social and Self-Regulated Learning (Hadwin & Oshige, 2011, p. 258)

	Self-Regulated Learning	Coregulated Learning	Socially shared regulation
Definition	The process of becoming a strategic learner by actively monitoring and regulation metacognitive, motivational, and behavioral aspects of one'' own learning.	Transitional processes in a learner's acquisition of SRL, during which members of a community share a common problem-solving plane, and SRL is gradually appropriated in response to social and cultural contexts.	Processes by which multiple others regulate their collective activity. From this perspective, goals and standards are co-constructed, and the desired product is socially shared cognition.
Focus of data collected and analyzed	Individual focus on dependent variables • Performance • Motivation • Strategies/skills • Metacognitive awareness • Self-reported behavior Social focus on instructional context	Discourse or dynamic interaction Interplay among individual, classroom, parental, and cultural influences	Discourse and dynamic exchange Individual roles and contributions but always in the context of others Evolution of idea units and regulatory activities
Data collected	• Self-reports • Performance measures • Mental models • Interview data • Observations • Think-aloud protocols	• Discourse • Frequency and content of interactions • Observations of shared behaviors and sociocultural dynamics	• Discourse • Observed interaction Individual roles and contributions to group • Group products
Analytical techniques	• Correlation of individual factors/measures • Content analysis • Comparative methods (e.g. case study, ANOVA, etc.)	• Discourse analysis • Content analysis • Correlational analyses • Class-level factors/measures	• Discourse analysis • Network analysis

Learning

From a cognitive perspective, learning involves building mental representations (Moreno & Mayer, 2007). Under SCFBL, learning can come in the form of a cognitive or affective conceptual change, or as a change in observable behavior.

Following the concept of self-regulated learning, the learner is encouraged to set their own learning goals through metacognitive strategies and then move between collaboration and reflection as they develop increasingly complex cognitive schemata. This occurs through individual cognitive processing and reflection; then reinforced and clarified through dialogue and shared meaning construction with others (Stein, Wanstreet, Glazer, Engle, Harris, Johnston, et al., 2007). One way that we reach this common understanding is through discussion and collaboration in formal and informal communities of inquiry (Bober & Dennen, 2001; Garrison, Anderson, & Archer, 2001; Littleton & Whitelock, 2005). Through these symbols, vicarious experiences are given meaning, form and continuity; and passed on to other members of a social network (Bandura, 1994).

Summary—A Social Cognitive Framework for Blended Learning

This section proposed a new model called the Social Cognitive Framework for Blended Learning (SCFBL), which has a conceptual foundation based in social cognitive theory, cognitive science, constructivism, and networked learning theory. The elements of the SCFBL include the executive function, learning space, learning design, interactive environment, multimodal learning activities, cognitive processes, and learning. A key theory in SCFBL is self-regulated learning which has had social elements added to it to create coregulation and socially shared regulation. Once these elements are in place, we

can turn our attention to the affective and cognitive outcomes that should result from these efforts. Next we will look at the three resulting constructs that this study measures: social presence, collaborative learning, and student satisfaction.

Social Presence

Social presence has been an important construct in distance learning since the concept was first introduced by Short, Williams, and Christie (1976). Social presence helps learners to project themselves online and feel a sense of community. Several years before Short et al. published their paper, G.W. Allport (1968) defined social psychology as "an attempt to understand and explain how thought, feeling, and behavior of individuals are influenced by the actual, imagined, or implied presence of others" (p.3).

It is well documented that some sense of social presence is necessary for a positive experience in any form of online education (Gunawardena, 1995; Gunawardena & Zittle, 1997; Tu, 2002; Tu & McIssac, 2002; Richardson and Swan, 2003; Liu, Gomez, Khan, & Yen, 2007). Gunawardena & Zittle (1997) and Richardson and Swan (2003) demonstrated that social presence is a predictor of satisfaction in computer mediated communication. Tu & McIsaac (2002) suggest that the greater the perception that social presence exists in an online course, the better the ability to substitute online communication for face-to-face encounters in collaborative learning situations.

The theory of social presence was based on previous work in psychology and communication including the concepts of intimacy (Argyle and Dean, 1965) and immediacy (Wiener and Mehrabian, 1968). Gunawardena and Zittle (1997) mention intimacy and immediacy as two important factors in the amount of social presence perceived to be found in a particular distance education course. Gunawardena and Zittle also stress the perception of teacher immediacy as critical in creating good affective

learning in any type of class. According to Gunawardena (1995), immediacy is "a measure of the psychological distance which a communicator puts between himself or herself and the object of his/her communication" (p. 151).

Since Short et al. first introduced the concept of social presence; its definition has continued to evolve and there have been many definitions over the years (Short et al., 1976; Gunawardena, 1995; Garrison, Anderson, and Archer, 2000; Tu and McIsaac, 2002; Picciano, 2002). Interestingly, despite more than two decades of research and debate, social presence remains surprisingly hard to define or describe. Over the years, various researchers have come up with slightly different definitions and characteristics to describe the construct (Short, Williams, and Christie, 1976; Gunawarden & Zittle; 1997; Garrison, Archer, & Anderson, 2000, Tu, 2002). To date, there remains no single, accepted definition of social presence (Lowenthal, 2009a). A recent definition by Garrison (2009) is that social presence is "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities." This is the definition that will be used in this study.

Similar to the lack of a common definition, Lowenthal (2009a) acknowledges that there is also no agreed upon tool to measure social presence, or even widespread agreement on how it should be measured. Lowenthal cites Gunawardena and Zittle (1997), Rourke et al. (2001), and Tu (2002) as being the most influential in this area and suggests that all current research is linked in one way or another to one of the tools developed by these researchers. Lowenthal points out that the instruments used by

Gunawardena and Zittle (1997) and Tu (2002) study self-reported attitudes while Rourke et al. (2001) focused on observable behaviors.

Social presence theory recognizes the importance of social and emotional factors in online learning. Tu (1999) stated that social presence is a significant factor in distance education and that it is one of the most important factors for social learning in computer-mediated environments. Tu (2002) also suggested that three dimensions of social presence exist in the forms of social context, online communication and interactivity, and online privacy. Garrison (2009) proposed that there are three dimensions to social presence which may be defined in terms of the participants identifying with the community, communicating purposefully in a trusting environment, and developing interpersonal relationships. A general finding from this body of research is that when information is presented in a manner that increases the perception of social presence, the learner becomes more engaged and retains the information better (Homer, Plass & Blake, 2008).

Lowenthal (2009a) describes three phases of social presence research: (a) telecommunications, (b) computer-mediated communication and (c) online learning. Because of its slightly different nature, perhaps social presence in blended learning can be considered the fourth phase. Nonetheless, due to its importance as a topic of research in distance education, it can be assumed that it will continue to be equally important for research in the field of blended learning. For example, Benbunan-Fich, Hiltz, & Harasim (2005) have suggested that it is a key component for learning networks. It has been well-documented that there is a strong correlation between social presence and student satisfaction (Gunawardena, 1995; Gunawardena & Zittle, 1997; Richardson & Swan,

2003). Richardson & Swan, 2003 also demonstrated a strong link between social presence and perceived learning, as did Caspi & Blau (2008) who also distinguished between three types of social presence: social presence as perception of others, social presence as self-projection and social presence as social identification. Rourke, Anderson, Garrison, & Archer (2001) and Rovai (2002) maintain that it is also important in the development of a community of learners. So and Brush (2008) found that student perception of social presence correlates to perception of collaborative learning and overall satisfaction. Liu, Gomez, & Yen (2009) found that social presence is a significant predictor of course retention and final grade in the online environments at community colleges and recommend two specific actions: early identification and effective intervention. They believe that effective intervention should include developing integrated social and learning communities; and building effective blended learning programs.

Russo and Benson (2005) found that the relationship between students' performance and their perceptions of their own presence in an online class reinforces the need for interaction in collaborative and reflective learning. After reflecting, the ability to offer ideas, ask for clarification, and solve problems also allows learners to articulate their understanding, engage in self-explaining behaviors and find meaning in the material with affective support from others. Establishing a high level of social presence through interaction and discourse should be an obvious strength of blended learning, easily established through a series of face-to-face meetings and then ongoing activities outside of the classroom. Social presence is also important while learners engage in reflective activities. These activities give learners a sense of connection, while allowing them a

necessary element of learner control in the blended environment. Social presence also reduces transactional distance (Gunawardena & Zittle, 1997), which can be very important when one is soliciting feedback after self-reflective activities.

Social Presence and Satisfaction

Regarding the correlation between social presence and satisfaction, Hermans, Haytko, and Mott-Stenerson (2008) found that in a blended or web-enhanced class, perceived ease of use of the technology and satisfaction with the instructors were the most important factors in satisfaction with the class. One of the strongest relationships was between satisfaction with the instructor and satisfaction with the course. Though not as strong, there was also a significant relationship between flexibility in the course and satisfaction. Hermans et al. maintain that social interaction with the instructor and other learners are an integral element of satisfaction in a course and that satisfaction with the instructor is the driving factor in whether a student is satisfied in a course. They recommend designing interactive courses that promote direct contact between the instructor and the student which facilitate discussions and real time interactions. Hiltz and Wellman (1997) also found that online discussions lead to increased student satisfaction.

Finally, we are beginning to see research on the connections between social learning and blended learning. So & Bush (2008) found a relationship between social presence and collaborative learning. Collaborative learning in turn was found to have a positive relationship with student satisfaction in a blended course. Social presence is also a key element in the Community of Inquiry blended learning model with was described earlier in this study. Other researchers have also found a connections between social

presence and blended learning (Jusoff & Khodabandelou, 2009; Kang& Kang, 2008; So & Brush, 2008; Whitehead, 2007)

Collaborative Learning

Collaborative learning has its conceptual roots in early 20th Century sociocultural and activity theories (Vygotsky, 1978; Leontiev, 1978) and the importance of social learning has been underscored by many researchers from many different perspectives (Bandura, 1986; Vygotsky, 1978; Roschelle, 1992; Wenger, 1998). Tu and Corry (2003) assert that humans learn through rich social interaction. Tu (2004) includes interactivity, social context and technologies as three major constructs in online learning communities. Learning communities play a significant role in academic success and persistence in higher education (Shea, Sau Li, & Pickett, 2006). When interactions among members of a community are directed towards a particular purpose, in this case learning, it is considered collaboration (Vesely, Bloom, & Sherlock, 2007). Roschelle and Teasley (1995) believe that learning is enhanced when students are placed in collaborative situations and define collaboration as a "coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem" (p. 70). Tu and Corry warn, however, that learners must be encouraged to understand the importance of collaborative learning by the instructor. If they don't, they may focus only on achievement and will not effectively participate in collaborative learning experiences.

Several studies have linked increased satisfaction in an online course to increased collaboration (Ferguson and DeFelice, 2010). Ferguson and DeFelice assert that effective communication between students and instructors is vital to a successful online course and that instructional strategies should include a variety of ways to promote communication such as live chat rooms, threaded discussions, and the use of blogs, combined with

prompt responses to all email inquiries. Jung, Choi, Lim, and Leem (2002) found that students who reported a high level of collaboration with others in the course also expressed a high level of satisfaction than those who engaged solely in task-oriented interaction with the instructor. Nummenmaa & Nummenmaa (2008) found that those who interacted collaboratively had a more positive reaction to a course. Interestingly, however, Drouin (2008) found that although a sense of community was related to student satisfaction within the course; it was not related to either course grade or retention in an online course of study.

Jarvela, Jarvenoja, & Veermans, (2008) maintain that motivation in collaborative learning situations occurs through interaction between the individual and the social environment, and the complex processes that regulate that interaction. So and Brush (2008) found that a blended learning format decreases psychological distance and increases student satisfaction.

Roschelle (1992) argued that the main point of collaboration is convergence, or the mutual creation of understanding and knowledge. One way that we reach this common understanding is through discussion and interaction in formal and informal communities of inquiry (Bober & Dennen, 2001; Garrison, Anderson, & Archer, 2001; Littleton & Whitelock, 2005). Roschelle believes that convergence is created when learners build share meanings incrementally and interactively through conversation by engaging in cycles of displaying, confirming, and repairing shared meaning. Jeong & Chi (2007) later confirmed Roschelle's findings that knowledge convergence did occur during collaborative learning. Francescato, Porcelli, Mebane, Cuddetta, Klobas, & Renzi. (2006) found that collaborative learning methodologies are effective when used either

with or without technology, especially when the instructor encourages communication and social support among learners.

As mentioned earlier, Moore (1989) identified three types of interaction in learning environments: learner-content, learner-instructor, and learner-learner. Hillman, Willis, & Gunawardena, (1994) later added a fourth type of interaction: learner-interface interaction. Although directed at online environments, learner-interface interaction is also a factor in blended learning. Moreno & Mayer (2007) explored the learner-interface interaction, describing it as a multimodal learning environment. They found five common types of learner-interface interactivity in multimodal learning environments: dialoguing, controlling, manipulating, searching, and navigating.

Hovorka, Rees, and Alkilani (2010) distinguish between situated (classroom) and distributed (online) learning and maintain that knowing is not localized and isolated, but is developed through interaction with the self and others. They described four types of interactors: (a) *direct interactors* who interact with other learners and the instructor, (b) *actors* who provide input without feedback, (c) *vicarious interactors* who benefit from observational learning, and (d) *non-actors* who do not participate in communication at all. Tu and Corry (2003) assert that the "main purpose of collaborative learning is to enrich learners' critical thinking, information exchange, and knowledge-generating processes and to attain rich interactive learning experiences" (p. 57).

Liu, Gomez, and Yen (2009) and Bannan and Milheim (1997) speculate that there are two types of collaboration that can by employed in online environments: inside and outside collaboration. Inside collaboration provides a supportive environment within the course where learners can ask questions, contribute suggestions or resources, and work

on projects with other learners. Outside collaboration emphasizes bringing in external resources such as guest speakers.

Although, the direction of collaborative learning appears to be learner-centered and self-directed, the cognitive constructs of learner motivation and readiness for self-directed learning, sometimes referred to as learning orientation also have to be taken into account (Davis, Carson, Ammeter, & Treadway, 2005; Vermunt & Vermetten, 2004). While self-regulated learning is the ultimate goal, the learner may not be prepared initially. Bandura (1994, p. 62) states that "cognitive factors partly determine which environmental events will be observed, what meaning will be conferred on them, whether they leave any lasting effects, what emotional impact and motivating power they will have, and how the information they convey will be organized for future use." In a knowledge construction approach to learning, the strategy would be to guide the learner to actively make sense of the information (Mayer, 2001; 2005). If a learner or group of learners does not have sufficient prior knowledge in a topic or they have a low learning orientation, then a highly structured blended course may be exactly what they need in order to prepare them for less structured learning environments in the future (Kirschner, Sweller, & Clark, 2006). In fact, Vrasidas and McIssac (1999) and So and Brush (2008) argue that greater structure for collaborative tasks leads to increased dialogue and interaction among learners when the activities are directed at learner-learner interaction. Some argue that collaborative interaction should even be facilitated through the use of elaborate scripts (Weinberger, Kollar, Dimitriadis, Mäkitalo-Siegl, & Fischer, 2009; Jurado, Molina, Giraldo, Redondo, & Ortega, 2008; Miao, Harrer, Hoeksema, & Hoppe, 2007.

Chi (2009) proposes a learning taxonomy in which interactive activities are suspected of being even better than constructive activities, which in turn are better than active activities, all of which are better than passive learning activities. Interestingly, Craig, Chi & VanLehn (2009) found that when students collaboratively observe tutoring, they tend to engage more actively in collaboration. This strengthens the argument that active learning methods such as collaborative learning can be improved by observing and is consistent with the theory of self-explanation (Chi, Bassok, Lewis, Reimann, & Glaser, 1989; Chi, De Leeuw, Chiu & LaVancher, 1994), as well as the theory of multimedia learning (Mayer, 2001, 2005; Sorden, 2005; in press).

Social cognitive theory asserts that effective learners actively construct knowledge by establishing goals and learning strategies, as well as monitoring their understanding (Zimmerman, 1998). They achieve this within the larger framework of collaborative learning as an interactive, two-way process between individual and social groups. One early social cognitive model for this learning interaction between individual and environment was Bandura's (1986) Model of Triadic Reciprocality. More recently, researchers such as Jarvela & Jarvenoja (2011) are beginning to explore a pragmatic middle-of-the-road approach that seeks to understand how individuals can direct their own learning within a social learning environment while simultaneously affecting and being affected by that environment.

Rogoff (1998) clearly distinguishes between the Vygotsky/Leontev and Piagetian sociocultural theories, and contrasts them with what she calls theories of social influence. The social cognitive theory and model for blended learning that has been presented in this paper would be considered by Rogoff to be a social influence model. A model of social

influence suggests that learning is in the individual and that the individual is separate from their social environment (the rest of the world). Both Weinberger, Kollar, Dimitriadis, Mäkitalo-Siegl & Fischer's (2009) example of a person-plus-surround system and Hadwin, Wozney, and Pontin's (2005) model of coregulation (social self-regulated learning) would likely fit Rogoff's idea of a social influence model.

Sociocultural strategies focus on interaction in the group, while the focus of social cognitive research remains on the individual and how they influence, interact with, and are influenced by the social environment. In the sociocultural approach, the sociocultural activity is the unit of analysis, while in the social influence approach the individual remains as the unit of analysis. Rogoff describe the social influence model as using a storage metaphor to indicate that knowledge is located in the brain and separated into past, present, and future. For example, memories are stored in the past and retrieved for use in the present. In the sociocultural models, individuals engage in dynamic processes of understanding based on sociocultural activities. According to Rogoff, cognition itself is a collaborative process, not an individual process.

While there may not be much literature that condemns collaborative learning as an instructional practice, there are studies that suggest some of the methods that are sometimes used in collaborative learning can be less effective. For example, Kirschner et al. (2006) warn against minimal guidance in instruction, which could be a problem in certain collaborative activities. Common instructor and student complaints about collaborative learning have also been documented (Barkley, Cross& Major; 2005; Miller, Trimbur, & Wilkes, 1994). Some of the more common complaints include when certain

students dominate groups or conversely contribute little to the group; when group discussion digresses and wanders off topic; and when conflict arises in the group.

Computer-Supported Collaborative Learning

Although collaborative learning should be a strong component of both online and face-to-face environments, computer-supported collaborative learning (CSLC) has emerged as a separate field of research (Resta & Laferriere, 2007), which is concerned with how we interactively learn together using computer mediated communication (Stahl, Koschmann, & Suthers, 2006). It is characterized by the sharing and construction of knowledge among participants using synchronous or asynchronous communication as their primary means of communication. CSCL research adds a rich dimension of understanding and effective practices to blended learning.

As technology becomes more user-friendly, the division between face-to-face and online will likely fade and the technology will no longer be the demarcation in blended learning (Osguthorpe & Graham, 2003). Dommel (2005) introduced a concept known as *ambient collaboration* where computer technology is no longer central to online collaboration as it has traditionally been. Instead the technology sits unobtrusively in the background, allowing users to synergistically move between face-to-face and virtual workspaces, concentrating on presence and collaboration rather than tools or the technology. As our understanding of blended theory develops, the idea of blending may be more about collaborative learning and individual reflection, than a blending of technology or location (Garrison and Vaughan, 2008).

The use of collaboration scripts involving IMS Learning Design (IMS-LD) and alternative scripting systems is a field of research in CSCL that has received some

attention. Collaboration scripts are sets of instructions that specify how group members should interact and collaborate to solve a problem (Jurado, Molina, Giraldo, Redondo, & Ortega, 2008; Miao, Harrer, Hoeksema, & Hoppe, 2007). An example of a collaborative script is provided by Roschelle (1992), who describes using a computer program to mediate collaboration between two 15 year olds to keep them on task for 45 minutes in constructing a rich, shared understanding of a scientific concept.

Weinberger, Kollar, Dimitriadis, Mäkitalo-Siegl, & Fischer (2009) introduce the concept of internal and external scripts. Internal scripts are cognitive schemata, (procedural knowledge), that help individuals understand and behave in meaningful ways. External scripts are social artifacts or programs that scaffold learners (Vygotsky, 1978) and facilitate knowledge acquisition by groups. External scripts are usually set up before the collaborative activity and are not generally dynamic while internal scripts are flexible and adaptive to changes in the collaborative activity.

Networked Learning

Networked or connected learning is a new form of CSLC that is receiving increased attention. Networked learning is related to theories of distributed cognition (Bereiter, 2002; Sawyer, 2005) and is rising with the emergence of Web 2.0 technologies. Because of technology, we are now able for the first time in history to form networks of individual minds that are able to work together in real time to create new knowledge without the limitations of space and time. Heylighen, Heylighen, Bollen, and Casaer (2007) describe this as social intelligence design (SID), which attempts to fuse three distinct realms: mind (cognition, intelligence), society (social interaction, organizations, institutions), and matter (objects, tools, technologies). Sawyer (2005) asserts that the

macroproperties of a system emerge from the interactions among its components." (p. 52). Some believe these ideas move the concept of learning, memory, and intelligence from the individual to social networks (Siemens, 2005; Downes, 2008).

Bandura (1994) notes that the more unique networks a person belongs to, the greater the chance the person will be exposed to new ideas, and it is generally through weak social ties that ideas are introduced to cohesive networks and diffused widely. So networks may form around specific objects, but it is often through weak and usually unobvious connections that new ideas emerge, not necessarily through the networks themselves. In fact, there is a real danger in networked learning that networks become so similar and entire social structures become so inbred, that they miss new developments or discourage new ideas that appear to be outside the accepted paradigms of the network. This is another reason that individual thought, self-regulated learning, and self-reflection are so important in an interconnected world.

One interesting theory that attempts to explain how networked learning works is object-oriented sociality (Knorr-Cetina, 2001; Conole, Culver, Weller, Williams, Cross, Clark, et al., 2008). Referring to Knorr-Cetina's work, Engeström (2005) posited that successful social networks aren't really centered on relationships or connections. Rather, he argued, their activities are centered on the value found in certain social objects. While not specifically describing object-oriented sociality, Bandura (1994) appears to echo this viewpoint by stating that although structural interconnectedness provides potential diffusion paths, it is the psychosocial factors that largely determine what gets diffused through those paths. In other words, it is the social value that is attached to a social object that determines whether a concept is adopted.

The practical implication for this line of thought is that blended learning should attempt to build social networks around social objects and ideas that have value and are of interest to learners. The more interest a social object holds for the learners in the community of inquiry, the easier it will be to form a vibrant group with common goals and learning objectives.

Correlation between Social Presence and Collaboration

One factor that this study will explore is whether there is a significant correlation between social presence and collaboration in blended environments. Again, the study did not try to find a causal relationship but simply whether the two constructs appeared to have a relationship. Because a blended course may have both online and face-to-face activities, the idea of social presence becomes a little more complicated. Does the social presence result from the face-to-face meetings, or does it develop because of the interactive online activities. Also, because a class meets face-to-face at some point does not necessarily guarantee that there will be any degree of social presence. For example, if the face-to-face portion of the course was conducted in a strictly traditional lecture format, then the students may never have the chance to really interact with each other or even the instructor. It is entirely possible that even though everyone was physically together, that there would be little to no perceived social presence in the course. Therefore, it should stand to reason that social presence as a construct has to be allowed to develop through interaction and collaborative activities. As perceived collaboration increases, social presence could be expected to also increase, and vice-versa.

Weinel, Bannert, Zumbach, Hoppe, and Malzahn (2011) found that while social presence does not cause collaboration, it can affect the attitude of participants towards collaborating on a particular task. Similarly Wise, Chang, Duffy, and del Valle (2004)

found that social presence can affect interactions between the learners and perceptions of the mentor in 1:1 situations, but that it has little effect on perceived satisfaction or engagement. Traphagan et al. (2010) revealed that even when groups were significantly different from each other, that collaborative styles became more established as tasks were experienced jointly. This suggests that even when group social interactions are not directly related to learning tasks, they may ultimately affect how students interact with each other while learning. Focusing on how social presence forms the basis for relations between actors in social networks, Kerwald (2007) describes a research approach known as Social Network Analysis and describes several social relational mechanisms that lead to collaboration: commonality, feelings of safety, trust, respect, rapport, and interdependence.

Rogers & Lea (2005) state that in group collaboration, social identity is the basis upon which social presence is built rather than interpersonal bonds, and that relatively simple, text-based computer mediated environments can provide the necessary social presence for collaboration. In fact, the use of more complex technologies that offer increased cues for interpersonal interaction can be detrimental to shared social identity. They also suggest that motivation for group-based behavior is social, rather than physical presence, which has implications for some forms of blended learning. Building on Rogers & Lea's research, Caspi & Blau (2008) found a positive correlation between two types of social presence (self-projection and social identification) with perceived learning, and conclude that instructors should encourage social participation and emphasize social identification with the group in order to increase collaboration and learning. Interestingly,

it is worth noting that Caspi and Blau did not find a strong relationship between social presence as perception of others and perceived learning.

Maintaining the importance of social presence for creativity and collaboration in virtual environments, Heldal, Roberts, Brather, and Wolff (2007) write that "collaborative problem-solving requires seamless technology. Then the group can interact more easily and support peripheral collaboration that also requires social presence and copresence" (p. 808). Heldal et al. distinguish copresence from social presence by defining copresence as being there together with one's partner, rather than a larger group. Continuing to comment on the importance of social presence in collaboration, Heldal et al. write that "high social presence is required for maintaining peripheral awareness in networked group activities, allowing coordination, supporting decision-making processes, negotiation and choosing strategies. Accordingly, high social presence in turn can allow increased social creativity" (p. 808).

Annand (2011) challenges the Community of Inquiry Framework, however, and asserts that its incorrect assumptions assign too much importance to the effect social presence and collaboration play in the framework when compared to cognitive presence. He writes that "The framework derived from this limited evidence has overstated the effects of sustained collaboration on the construct of social presence. This in turn inappropriately magnified the effect of social presence on cognitive presence" (para. 32). He goes on to write that:

> The recurring suggestion of recent CoI-based empirical research is that social presence is of questionable value in the online higher education learning experience because it does not appear to have an important effect on cognitive

> presence. Rather, appropriately structured learning materials, timely, non-contiguous, one-on-one instructor–learner communication, and a teaching focus that enhances individual learner attributes and effort may be the best prescriptions for effective online learning in higher education. Limited group-based collaboration may be able to uniquely develop certain interpersonal skills, like the ability to interact with multiple learners and manage group dynamics, but it may not be necessary to synthesize knowledge or achieve other valued higher-order learning outcomes. (para. 27)

One response to Annand might be, however, that if it can be shown that higher levels of social presence and collaboration lead to increased student satisfaction in a course, and that in turn, higher student satisfaction leads to higher completion and retention levels, then even if it cannot be shown to have an important effect on cognitive presence, that it may none-the-less be important for higher education instruction if it can be shown to improve satisfaction and ultimately course completion.

Satisfaction in Blended Learning Environments

A major goal in a learner-centered strategy should be student satisfaction with the learning experience. If the student feels that they have learned the material, have a deep understanding of it, and that the learning experience was positive; then they will have a strong sense of satisfaction towards the end of the course (Martin & Reigeluth, 1999). However, it is interesting to note that research has shown that there does not appear to be any correlation between student satisfaction and student background characteristics such as age, gender, grade level and computer expertise (Kitchen and McDougal, 1998; Yaverbaum and Ocker, 1998).

Satisfaction is an affective construct that is often considered to be a predictor of learning outcomes (LaPoint & Gunawardena, 2004). Richardson & Swan (2003) studied learners' perceived social presence and its relationship to perceived learning and satisfaction with instructors. They found that all the variables correlated and that social presence was a good predictor of student satisfaction. Beyond being important from the learner's perspective, student satisfaction is important to the institution because it has been shown to be an important factor in student retention (Liu, Gomez, Khan and Yen, 2007; Liu, Gomez and Yen, 2009). If students are satisfied with their learning experience, then they will be much more likely to continue with the institution, report favorably to their friends and colleagues, be motivated to achieve more, and be more likely to engage in student life activities. This connection between student satisfaction and student achievement, as well as retention, is one of the main reasons that student satisfaction should continue to be a primary focus of research in blended learning environments.

After controlling for the instructor, exams, and number of students, Cluskey, Hodges, & Smith (2006) found significantly improved student performance and course pass rates after transitioning from a traditional f2f course to a hybrid online accounting class. Stein (2004) found that satisfaction is determined by the degree of structure in the course. Elements that defined structure include clearly defined objectives, assignments, and deadlines. Drennan, Kennedy, and Pisarski (2005) found that positive perceptions about technology and an autonomous learning mode can affect satisfaction.

Because much of this research relies on self-reported questionnaires, however, it is worth noting that Denson, Loveday, and Dalton (2010) examined student course evaluations and found that as much as three-fourths of the variation in self-reported

course satisfaction may be predicted by unrelated factors inherent in the structure of the questionnaires such as student characteristics, reason for enrolling in the course, and course evaluation items. For example, male gender can be viewed as a negative predictor of course satisfaction because the literature indicates that males tend to give lower ratings than females. Denson et al. recommend that we study this issue more so that we understand what these course evaluation instruments are really measuring and ensure that they are designed to be valid and reliable.

Student satisfaction, therefore, is an important indicator of the factors that lead to motivation to achieve and complete a course, project, or process of learning. Without satisfaction, creating an environment that continues to motivate would be difficult to achieve. Therefore, student satisfaction is an important element to promote in learning as well as an important construct to research in order to identify factors and instructional approaches that lead to greater student satisfaction.

Concluding Summary of the Literature

The literature shows that while a considerable amount of research has been done on social presence, collaborative learning, and satisfaction in the areas of distance and online education; little research has been done in relation to how these constructs affect blended learning or are affected by it. The concept of blended learning itself is starting to change. The current view of blended learning as a combination of online and face-to-face is slowly coming to be seen as outdated and simplistic. It is giving way to viewing blended learning as an entirely new approach to learning. As the literature demonstrates, current technology and learning research is starting to transform blended learning into a dynamic learning method that can be self-guided, guided by an instructor, or facilitated

by a group or network. New technologies have also transformed the possibilities. Personal learning environments, mobile technology, and classroom innovations are pushing the boundaries of what is considered as online or face-to-face.

The literature on blended learning and the three constructs measured by this study tend to be dominated by various sociocultural perspectives. There are very few models that have a social cognitive foundation, however. In response, several respected and well-researched social cognitive theories from sociocultural and networked learning theories were blended to create the Social Cognitive Framework for Blended Learning. Supporting literature was presented for each of the components found in the framework.

The three constructs of social presence, collaborative learning, and satisfaction will likely continue to be important topics of research in blended learning, just as they have been with online and distance education over the years. There is a strong need for research in these areas to understand how they evolve, as blended learning evolves. Finally, blended learning shows great promise and will likely be a rich field of research for many years to come.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

Blended learning in education is growing due to a shift in needs of learners and advancing technology. In addition to the obvious benefits of schedule flexibility and physical space savings, it holds many promising advantages for creating learning-centered environments that promote collaboration, encourage on-going engagement outside of the classroom, provide quick feedback, enhance the student experience, and ensure that students leave the college with marketable technical skills.

But we need to be sure that we are structuring and promoting the right kind of learner activities in the blended learning environments that we are setting up, and that these are promoting student satisfaction which leads to increased student motivation, success, and retention (Liu, Gomez, Khan, &Yen, 2007; Chickering & Gamson, 1987). Two constructs that this study will focus on are collaborative learning and social presence and how they correlate to student satisfaction in blended courses. Specifically, the research problem of this study is to examine the relationships between perceived collaboration or social presence and student satisfaction in blended courses at one community college system.

Research Questions

1. Does perceived social presence in a blended community college course correlate with reported student satisfaction?
2. Does perceived collaborative learning in a blended community college course correlate with reported student satisfaction?
3. Does perceived social presence in a blended community college course correlate with perceived collaborative learning?

4. How do age, gender, ethnicity, computer expertise and number of distance courses previously taken correlate with perceived social presence, perceived collaborative learning, and reported course satisfaction in a blended community college course?

Research Hypotheses

H1: There will be no significant correlation between the constructs of perceived social presence and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H2: There will be no significant correlation between the constructs of perceived collaborative learning and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H3: There will be no significant correlation between the constructs of perceived social presence and perceived collaborative learning as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H4: There will be no significant correlation between student demographic data (gender, age, ethnicity, computer expertise, and number of distance courses previously taken) and the constructs of perceived social presence, perceived collaborative learning, and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire at one community college.

Research Design

This study uses a quantitative correlational design which allows the researcher to analyze student demographic data along with the relationships between the two independent variables (social presence and collaboration) and a dependent variable (student satisfaction) in a blended course. The study intends to quantitatively examine the correlation between perceived collaborative learning or perceived social presence and reported student satisfaction. This design was selected because the study intends to analyze several variables in a single study, as well as the strength of any significant relationships between the variables.

According to Gall, Gall, & Borg (2006), correlational research designs are helpful in studying educational problems. The advantage of correlational research design over causal-comparative and experimental research designs is that relationships among a large number of variables can be analyzed in a single study. And the relationships between several variables can be analyzed singly or in combination to determine how they may affect emerging patterns of behavior. A second advantage of correlational design is that the strength of relationships between variables can be analyzed, which causal-comparative designs cannot do. Gall, Gall, and Borg also state that correlation research design is "used for two main purposes: (1) to explore causal relationships between variables and (2) to predict scores on one variable from research participants' scores on other variables" (2006, p. 337). This study is a causal relationship study rather than a prediction study.

Population and Sample

The sample of participants was drawn from students enrolled in one or more blended courses on one campus in a multi-campus community college system in the

southwestern United States. The college was established as a county community college in 1970. From the beginning, the college had three campuses located in the county's three largest communities to serve the large land area of the county. A small fourth campus was eventually added in the remote far northern section of the county to provide education services to isolated communities in the upper third of the county. Recently, a virtual distance education campus has been added as the fifth campus.

Because of the structure of three main campuses that are located an hour's driving distance from each other, and the fourth smaller campus that is located several hours away from the other campuses, distance education has always played a strong role at the college. In the early 1980s the college first delivered distance education by videotape and eventually shifted to providing distance education by telecommunications in the late 1980s. The college's web site reports that in 2008-2009 it had approximately 13,000 students (unduplicated headcount) distributed among the four physical campuses and its distance education campus.

Online education is an important part of the college and the distance education campus is currently the largest campus, based on student count. This multi-campus college is no different from other higher education institutions in that the shift to online instruction is playing an increasingly prominent role in the system. Blended courses are viewed as a complement to this traditional focus on distance education in that it continues the college's original commitment to each of its micropolitan areas, while providing the advantages and flexibility of online instruction in a blended format that offers improved learning opportunities to the college's students.

Students in the studies sample were not randomly selected; rather they were part of a canvass sample that invited all blended classes at one campus in the spring of 2011 to participate in the study. It was also a convenience sample, because only students from one campus, in classes whose instructors agreed to give up some of their instruction time were included. Most courses at this campus are not blended, but twelve blended courses at this one campus were identified.

Of these twelve, one course was treated a pilot course. Permission to access the remaining 11 courses was gained and all were included in the study. A recent analysis of enrollment conducted shortly before this study indicated that the average number of students per class on this campus at the time of the study was 17, so it was anticipated that the sum total of these classes could possibly yield a population of up to between 150 and 200 unique participants. During the course of the study, however, it became apparent that seventeen students per class was a large number for most of the hybrid courses. The number of participants in any particular class ranged from 2 to 17 students. Ultimately a sample size of 108 participants was achieved which should yield a confidence interval of 6.95 with a confidence level of 95%.

Though the questionnaires were anonymous and reported in aggregate, information was tracked by classroom. The response rate was very high from first-time visits, and instructors were reluctant to give up additional instructional time due to the approaching end of the semester. With the exception of one class, classes were not revisited to achieve a higher response rate which was determined to be sufficient from first-time visits. The response rates ranged from a low of 33% to 100% with an overall average of 77%, or 108 students out of a possible 140.

Gall, Gall, & Borg (2006) state that it is important in a causal relationship correlational study to select a sample of participants who are reasonably homogeneous. Otherwise, a highly heterogenous sample with participants who vary widely from each other could obscure causal relationships between variables. The sample size in this study was relatively homogeneous as most students were from the Colorado River tri-state region of the Mohave Valley. They attended the same campus, and were all community college students taking blended courses. Ethnically the sample consisted of 71% Caucasian and 15% Latino, with exactly half of the participants being 25 years old or younger, and half being 26 years or older, which also caused the sample used in the study to be relatively homogeneous.

Instrumentation/Sources of Information

The instrument used in this study measured perceived collaboration, social presence, and satisfaction. It is called the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire (So & Brush, 2008) and it has four sections: demographics, satisfaction, collaborative learning, and social presence. The demographics section has five general information items, the satisfaction section has eleven items, the collaborative learning section has eight items, and the social presence section has seventeen. All four sections come from the CLSS Questionnaire and all except the first section are rated on a five-point Likert scale.

Using an exploratory factor analysis to test the validity of the instrument is addressed by So and Brush (2008, p. 324):

> An exploratory factor analysis with principal component extraction was performed in an attempt to refine the instrument. Despite the small sample size, the Kaiser–Meyer–Olkin (KMO) and Bartlett's tests of sphericity tests indicated

the adequacy of current data for factor analysis. After factor analysis, 12 items that did not load on any factors or highly cross-loaded on multiple factors were removed. Thus, the instrument used for the final analysis consisted of 11 items for the Satisfaction Scale, eight items for the Collaborative Learning Scale, and 17 items for the Social Presence Scale. The Cronbach's alpha coefficients were .85 for the Satisfaction Scale, .72 for the Collaborative Learning Scale, and .85 for the Social Presence Scale.

Validity of the questionnaire was addressed through a small pilot of five students. As a result of this pilot, one ambiguous question was slightly altered when it was determined that study participants might have questions with it. Additionally, a committee of experts consisting of three colleagues was consulted to determine if any ambiguous questions or other issues existed with the questionnaire. Other than one question having to be slightly rewritten as a result of the pilot, no questions were determined to be ambiguous and none were removed from the original questionnaire developed by So and Brush (2010).

Data Collection

The data was gathered late in the second half of the spring semester of the 2010-2011 school year. An instrument known as the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire (So and Brush, 2008) was used. Instructors of the blended courses were asked to set aside approximately 30 minutes of one class for students to complete the questionnaire. This improved the return rate on the questionnaires. The researcher visited each participating class in order to explain the general purpose of the study and to explain that participation is entirely voluntary. Students not wanting to participate were able to simply turn a blank questionnaire back

in, or not accept the questionnaire in the first place. Students were provided written information in advance regarding the intent of the research along with the promise that all information would remain confidential. Students signed a consent form as well that indicated that they were willing to participate in the study. Each class was visited on one or more occasions in an attempt to maximize the response rate where necessary.

Data Analysis

The quantitative data was analyzed with SPSS in all cases. Before applying inferential statistics to test for relationships between the constructs, descriptive statistics such as percentages, mean and standard deviation were applied to describe the sample in terms of characteristics, course satisfaction, collaboration and social presence. This descriptive analysis enabled the highlighting of important characteristics about the sample that provided a more complete understanding of the inferential analysis.

The data was then analyzed with an alpha level of .05 for all significance tests in the study. The Likert-type scales were considered to be interval scales, or continuous variables, so the Pearson product-moment correlation coefficient was used for the first three hypotheses in relation to the sections on social presence, collaboration, and student satisfaction. Scores of each section were averaged for each student. The correlation coefficients were computed using Pearson's r to examine whether there was a significant statistical relationships between collaborative learning and student satisfaction (hypothesis 1), social presence and student satisfaction (hypothesis 2), and collaborative learning and social presence (hypothesis 3). The importance of each of these constructs and the significant relationships between them was documented in chapters one and two of this study.

To address hypothesis 4, it was considered to calculate correlational coefficients using a point biserial correlation coefficient (rpb) to look for relationships between gender, age, ethnicity computer expertise, and previous distance course experience with each of the three constructs of perceived social presence, perceived collaborative learning, and reported course satisfaction. But in the actual analysis for all variables was calculated with a Pearson correlational coefficient because it was determined that most of the variables with the exception of ethnicity could be viewed as a ranked or ordinal variable. An argument can be made that gender is a dichotomous variable and the point biserial correlation coefficient (rpb) should have been used at least for that variable, but the Pearson correlation coefficient was considered an adequate analysis to explore whether a significant relation existed as long as this limitation was kept in mind. The Mann-Whitney U test was used to analyze two ethnic groups that had a sufficient sample size. The goal of the analysis for research question 4 was to determine if a characteristic such as age had a statistical relationship with a construct such as course satisfaction, for example, which allowed a richer analysis of the data at the conclusion of the study.

CHAPTER 4

ANALYSIS OF DATA

This chapter discusses how the data was analyzed and what the results of the data analysis were. The chapter has four principal sections that describe the process used in the analysis of data:

1. Data Screening
2. Tests for Normality
3. Descriptive Statistics of the Sample
4. Correlational Analysis

The research questions examined the relationships between perceived collaborative learning, perceived social presence and self-reported student satisfaction in blended courses at one campus in a community college system. There were four hypotheses. The first three hypotheses focused on the relationships between the two independent variables of perceived collaboration and perceived social presence, and the dependent variable of student satisfaction. The fourth hypothesis dealt with the relationships between the three variables and demographic data (gender, age, ethnicity, computer experience, and number of online courses previously taken). The instrument used for the study was the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire (So and Brush, 2008). The CLSS has a section for demographic data and then has three sections where students self-reported their perceptions of the amount of satisfaction, collaboration and social presence in each blended course. Responses in these three sections were indicated by circling numbers one through five on a Likert-type scale with a 1 signifying “strongly disagree” and a 5 signifying “strongly

agree". The section on student satisfaction had 11 questions, the section on collaboration had 8 questions, and the section on social presence had 17 questions.

Data Screening

The original sample size was 108 participants from 11 blended courses. The data was entered by each participant on paper forms and the author then transferred the responses from the paper forms into an Excel spreadsheet. After reviewing each questionnaire by hand, six questionnaires (records 29, 37, 44, 53, 58 and 74) were discarded because they were assessed to not be honest response patterns. An example of a non-honest response pattern of answers was demonstrated by circling a single number consistently and excessively in the Likert-type scales for a particular section. An example of this is when a participant circled a single number for one or more sections, or simply made one large circle around a single column of numbers. Another example was when a participant appeared to stop answering the questions, and started circling a single number for the rest of the questionnaire. Three more questionnaires (records 52, 81, and 86) were discarded for not being complete and having excessive missing data. Removing these nine questionnaires left a total of 99 questionnaires for analysis.

The data was then exported from the Excel Spreadsheet into SPSS. Demographic variables that were imported from Excel as string variables were converted to numeric values with labels. The mean was then calculated for each section in each record and saved as satisfaction, collaboration and social presence. The z scores were calculated on each of those means. This was done to identify any additional questionnaires that were outliers and had a combined mean that was either too high or too low as reflected by having a z-score beyond plus or minus 3.29. After reviewing the z scores, one additional questionnaire, (record 72), was eliminated for being a univariate outlier with an

unacceptably low z score (-3.57) in the social presence section and the appearance of non-honest answering in that section. A z score for any record in any section that was greater than plus or minus 3.29 was considered to be unacceptably high. This left a total of 98 questionnaires for the subsequent analysis of data.

Tests for Normality

Before looking at the descriptive statistics of the demographic variables, the dataset had to be tested for normality to see if any further questionnaires needed to be removed and to make sure that the distributions approached approximate symmetry. Therefore, the mean of the three variable sections (satisfaction, collaboration and social presence) for each questionnaire was tested for normality. The mean scores were based on the Likert-type scales used to rate each statement in the questionnaire on a scale of 1 to 5, with 1 equating to "strongly disagree" and 5 being "strongly agree". A descriptive analysis for normality was run in SPSS on the section mean scores. The descriptive statistical output from SPSS for each of the variables is presented in Table 4.1.

Table 4.1.
Descriptive Statistics of each Construct

Variables and Descriptives	Statistics
Satisfaction	
Mean	3.9369
Std. Deviation	.74136
Skewness	-.781
Standard Error of Skewness	.244
Kurtosis	.454
Standard Error of Kurtosis	.483
Collaboration	
Mean	3.5153
Std. Deviation	.76830
Skewness	-.695
Standard Error of Skewness	.244
Kurtosis	.548
Standard Error of Kurtosis	.483
Social Presence	
Mean	3.5210
Std. Deviation	.54714
Skewness	.122
Standard Error of Skewness	.244
Kurtosis	-.392
Standard Error of Kurtosis	.483

When considering the measure of the shape normality for each frequency distribution, the values for skewness and kurtosis must be considered. The statistic for skewness indicates the amount and direction of the skew, while kurtosis indicates how tall and short the central peak is relative to a standard bell curve. We can see in table 4.1 that the distribution for satisfaction is moderately skewed to the left, the distribution for collaboration is moderately skewed to the left, and the distribution for social presence is approximately symmetric.

In addition to examining asymmetry through skewness, the height of the central peak should be examined through the statistic for kurtosis. The kurtosis in a normal distribution is 0. If the value for kurtosis is approximately 0, then the distribution is said

to be mesokurtic. If it is less than 0, the distribution is platykurtic and the central peak is lower. It is leptokurtic if it is greater than 0, which means that the central peak is higher. As the values for kurtosis in Table 1 indicate, the distributions for satisfaction and collaboration are leptokurtic while the distribution for social presence is slightly platykurtic.

Next, the standard error for skewness (.244) and the standard error for kurtosis (.483) was divided into the statistic for skewness and kurtosis on each variable to check for excessive z scores of plus or minus 3.29. As we can see in Table 4.2, the z score on kurtosis for the satisfaction mean variable was -3.201. That was the only variable that came close to the plus or minus 3.29 maximum values. The rest were well within the acceptable range.

Table 4.2.
Skewness and Kurtosis of Variable Divided by Standard Errors to Determine the z Scores and Normality of the Histograms

Calculation	Resulting z Score (+ or – 3.29 is the limit for Measures of Shape Normality)
Satisfaction Skewness -.781/.244	-3.201
Satisfaction Kurtosis .454/.483	0.940
Collaboration Skewness -.695/.244	-2.848
Collaboration Kurtosis .548/.483	1.135
Social Presence Skewness .122/.244	0.500
Social Presence Kurtosis -.392/.483	-0.812

The histograms for each of the variables are presented in Figures 4.1 through 4.3. The histograms were used to visually inspect each of the three distributions for satisfaction, collaboration and social presence. A visual examination of the histogram for each of the variables clearly shows some skewness, confirming the previously reported statistics of skewness and kurtosis, as well as the z scores. However, the histograms also

confirm the assessment that the distributions of the three variables show acceptably approximate normality,

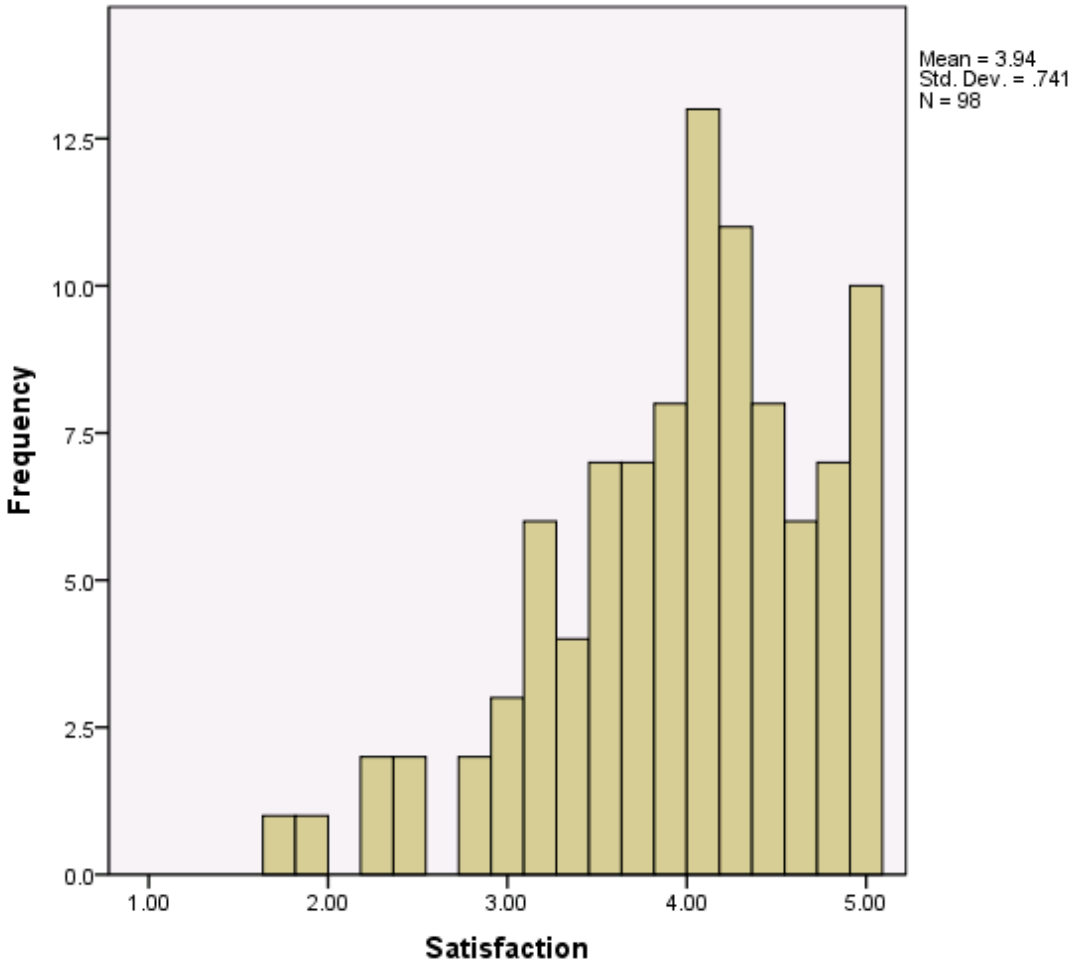

Figure 4.1. Histogram Displaying Frequency Distribution of Satisfaction.

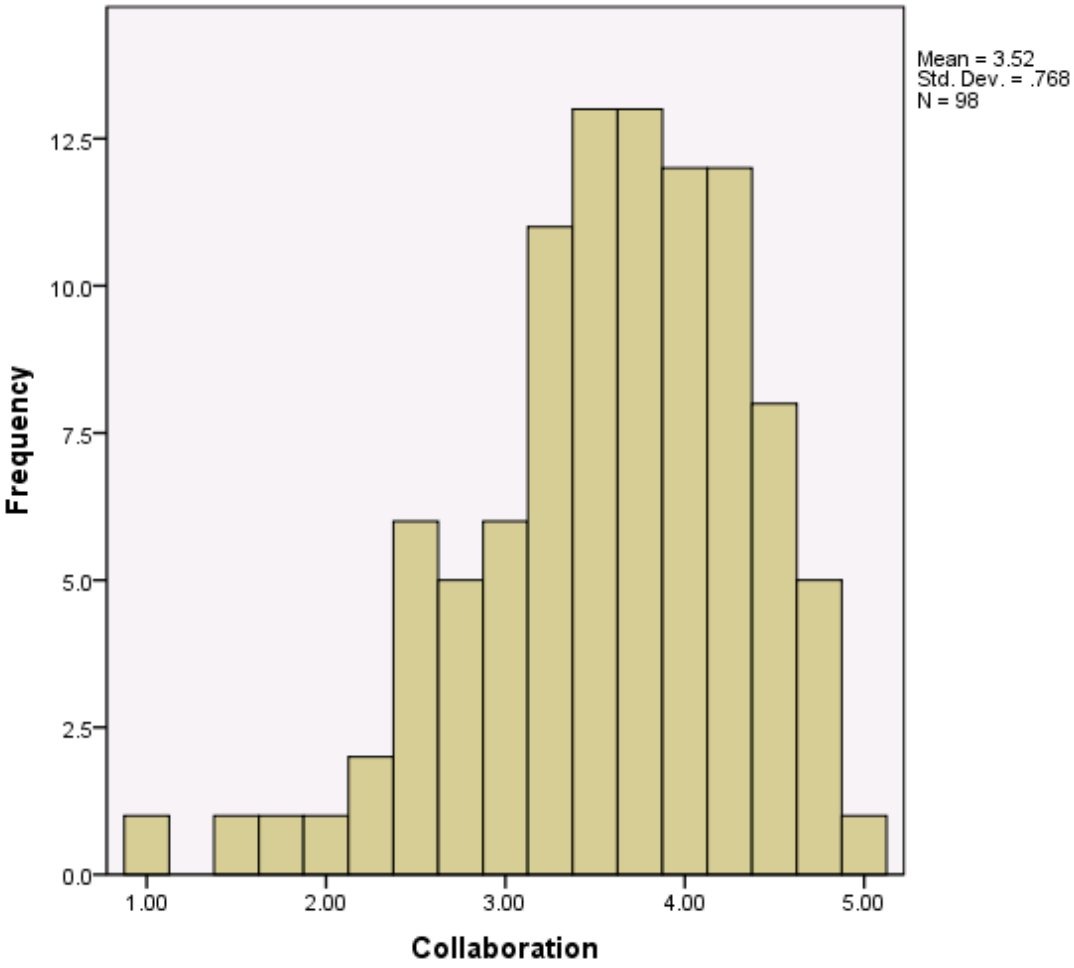

Figure 4.2. Histogram Displaying Frequency Distribution of Collaboration.

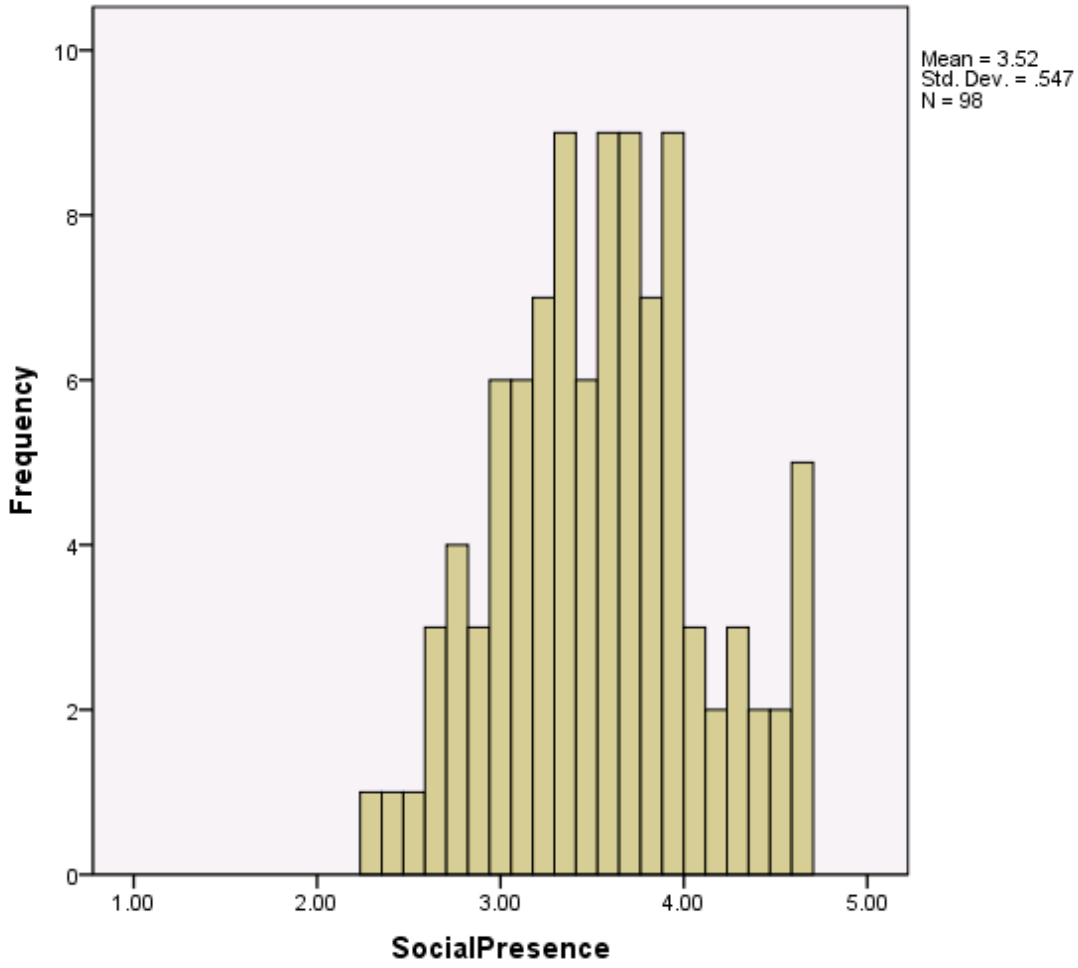

Figure 4.3. Histogram Displaying Frequency Distribution of Social Presence.

Next the Kolmogorov-Smirnov goodness-of-fit test and Shapiro-Wilk test for normality were run in SPSS. The tests were run with the standard alpha of .05. The results are shown in Table 4.3.

Table 4.3
Goodness-of- Fit Tests for Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Satisfaction	.095	98	.029	.949	98	.001
Collaboration	.084	98	.086	.967	98	.014
Social Presence	.055	98	.200*	.986	98	.381

a. Lilliefors Significance Correction
*. This is a lower bound of the true significance.

There were two issues that appeared in the Shapiro-Wilk test shown in Table 4.3, however. The satisfaction variable was reported at a .001 level of significance and the collaboration variable was reported at a .014 level of significance. Both values are below the standard .05 level of significance, suggesting that the data does not come from a normally distributed population for those two variables. It was determined, however, that there was enough data in the previous calculations and the subsequent Q-Q plots to provide adequate evidence that the distributions approximated normality sufficiently to proceed with the correlational analysis.

Finally, the Q-Q plot graphs for each variable in Figures 4.4 through 4.6 were analyzed to determine whether the graphs indicated approximation to normality. The Q-Q plots for satisfaction and collaboration showed that the majority of points were on or near the line indicating approximation to normality, while the Q-Q plot for the social presence variable was exceptionally good.

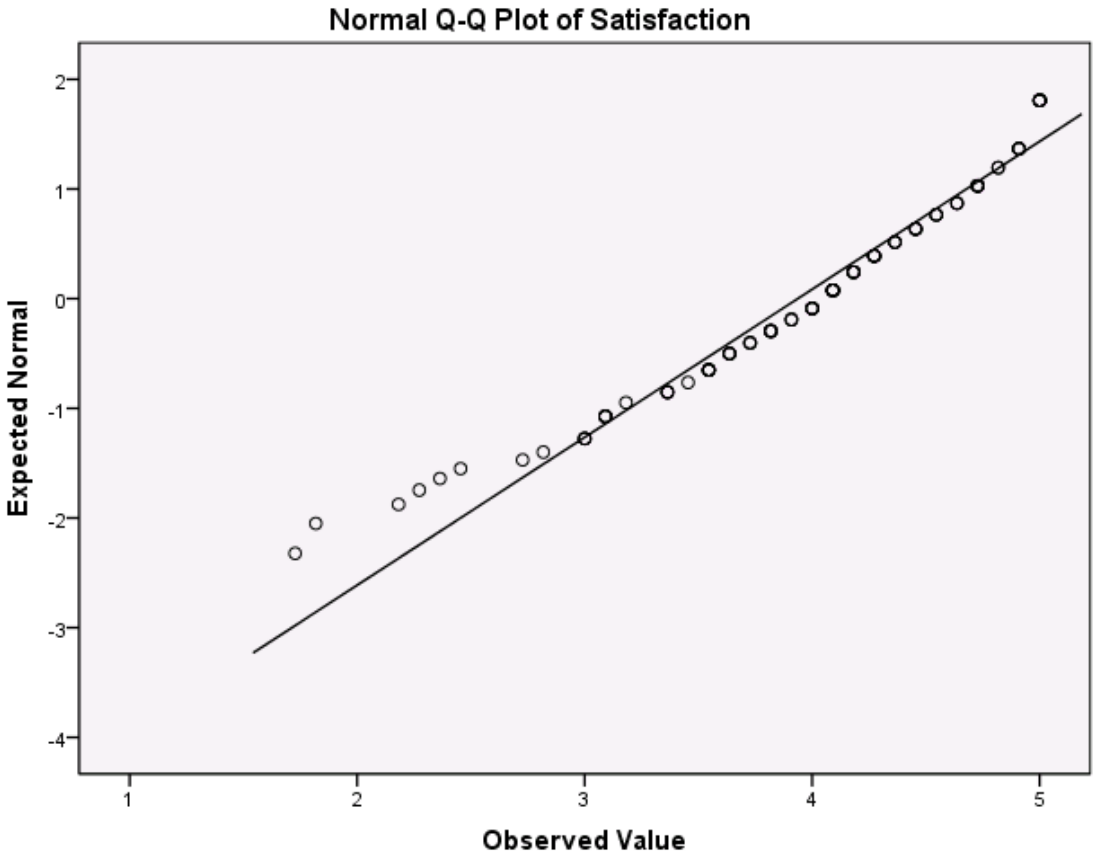

Figure 4.4. Normal Q-Q Plot of Satisfaction.

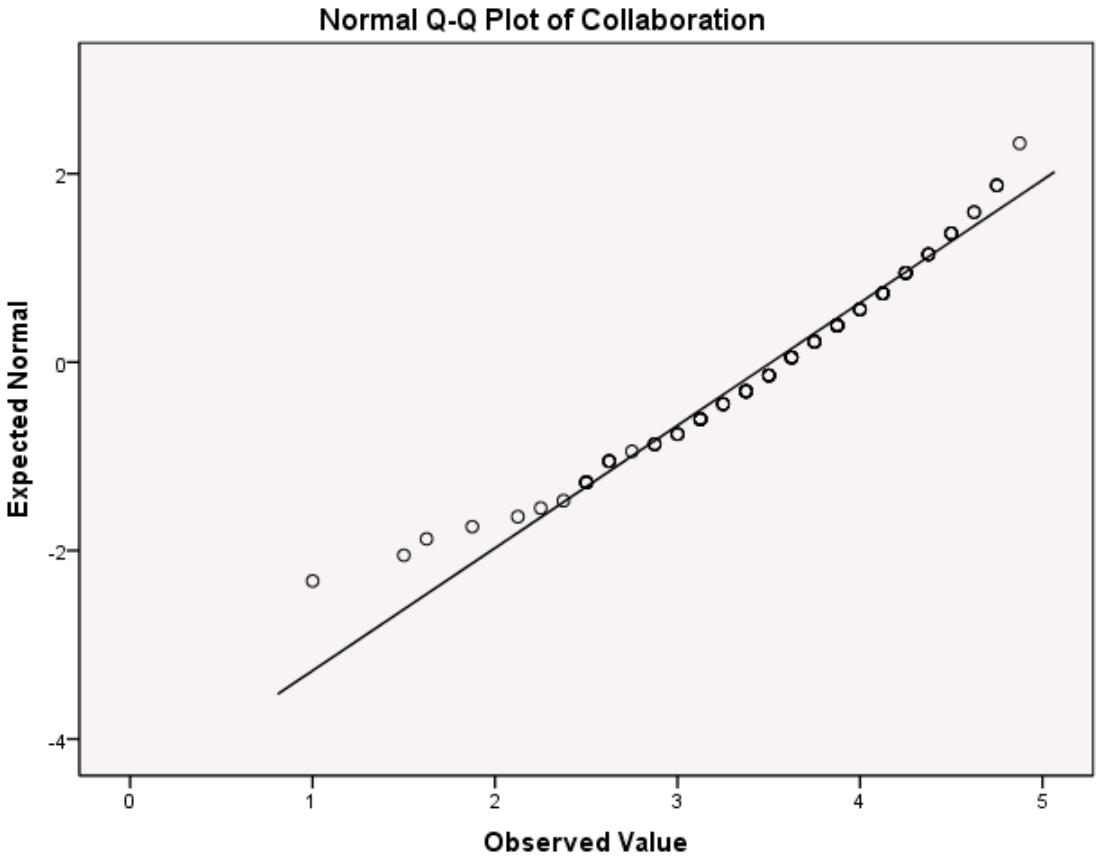

Figure 4.5. Normal Q-Q Plot of Collaboration.

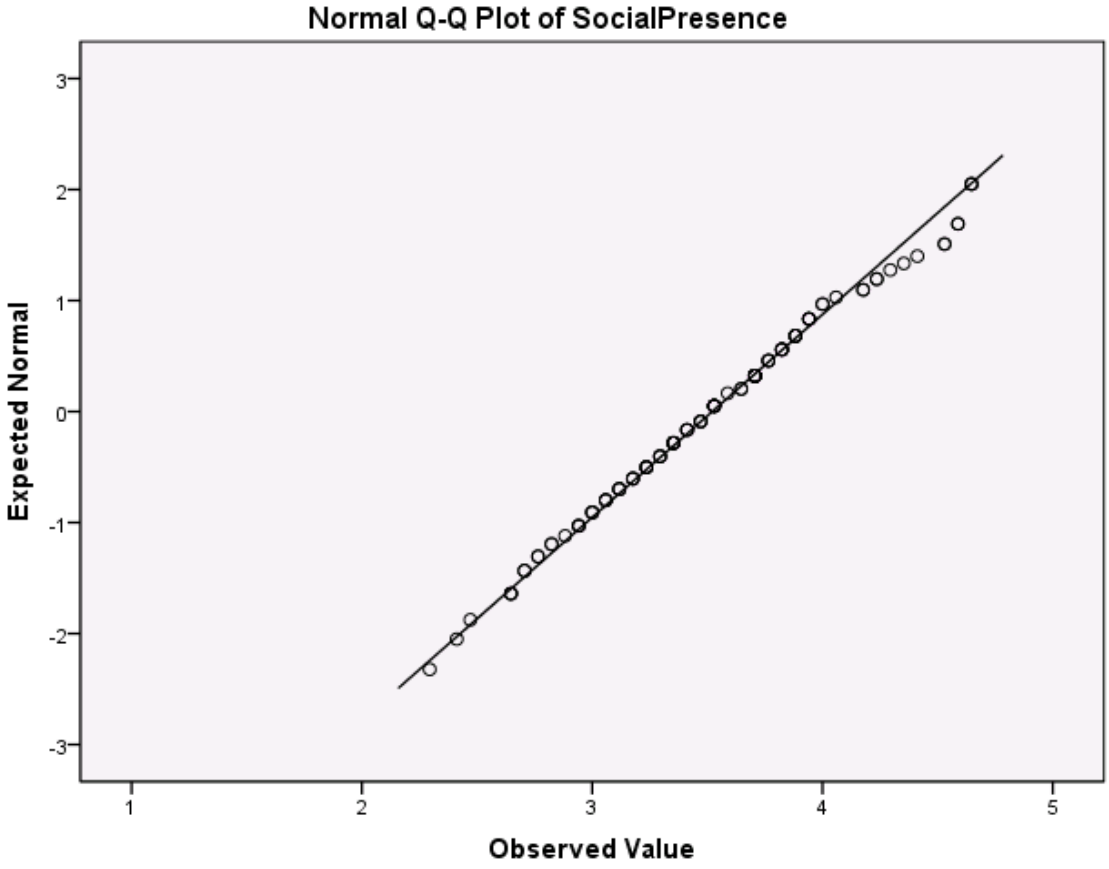

Figure 4.6. Normal Q-Q Plot of Social Presence.

Thus, as has been demonstrated in the previous examples, the indicators for normality were analyzed and found acceptable in most cases in the following order:

- All univariate outliers were removed from the dataset
- Descriptive statistics for skewness and kurtosis were analyzed and determined to be acceptable.
- The z scores on skewness and kurtosis for each variable were acceptable and there were no outliers.

- There were two problems on the Shapiro-Wilk test of normality with the significance on the satisfaction variable (.001) and the collaboration variable (.014) both being less than .05. The significance of the third variable representing social presence was acceptable at .381. It was determined, however, that there was enough evidence in the other tests to assume approximation to normality for all three variables.
- The normal Q-Q plots for all three variables showed that the majority of points were on or near the line, indicating approximation to normality. The Q-Q plot for the social presence variable was exceptionally good.

Based on this analysis and the calculated indicators of normality, it was determined that the variables sufficiently approximated normality and that we could continue with an analysis of the descriptive statistics for the demographic variables, as well as the correlational analysis.

Descriptive Statistics on the Sample

Once all outliers and non-honest response patters were removed, the sample size consisted of 98 participants. The demographic variables from the questionnaire showed the following breakdown for each of the variables as listed in Tables 4.4 through 4.8. An analysis of the following tables suggests that the students taking blended course did not differ in makeup from the general population of the college as reported in the latest statistics provided by the college's department for planning and institutional research.

Table 4.4
Gender Breakdown of Participants

Gender	Frequency	Percent
Female	61	62.2
Male	37	37.8
Total	98	100

The breakdown in table 4.4 of participants by gender roughly mirrors the breakdown of the overall student population by gender for the overall college system. 62% of the participants identified themselves as female while 38% identified themselves as male. The data reflects an uneven distribution of the participants in terms of gender.

Table 4.5
Age Range of Participants

Age	Frequency	Percent
u18	4	4.1
18-25	41	41.8
26-35	23	23.5
36-45	14	14.3
45+	16	16.3
Total	98	100

The age breakdown of participants in table 4.5 also mirrored the general college population. Of the participants who were included in the study, 4% reported themselves as under 18, 42% within the range of 18 to 25 years of age, 24% as 26 to 35 years of age, 14% as 36 to 45 years of age, and 16% at 45 years of age or older. Two interesting characteristics surfaced from this statistic. One was the large number of older students at 45 years or above who were taking a blended course. The second interesting fact was that the sample was roughly evenly divided with 46% being traditional students at 25 years or below and 54% being non-traditional students at 26 years or age or above.

Table 4.6
Self-Reported Ethnicity of Participants

Ethnicity	Frequency	Percent
African American	1	1.0
Asian/Pacific Islander	4	4.1
Caucasian	71	72.4
Latino	14	14.3
Other	6	6.1
Not Applicable	2	2.0
Total	98	100.0

Once again, the breakdown of participants who identified their ethnicity mirrored the overall population of the college, whose student population is overwhelmingly Caucasian. 72% of participating students who were included in the study identified themselves as Caucasian. There is also a sizeable Latino population in the area and this is reflected in the sample as 14% of the participants identified themselves as Latino. The two other self-reported ethnic groups were small with 4% identifying themselves as Asian/Pacific Islander and 1% as African American. Additionally, 6% identified themselves as "other", which could be accounted for by the fact that there was no category for Native American and there are several Native American reservations in the area of the college campus. One possible flaw in the study may have been to allow a category for "Not Applicable," which may not have been an appropriate category to self-report as ethnicity. Since ethnicity was not reported as a ranked value, however, this value was kept in the results and reported.

Table 4.7
Self-Reported Experience with Computers

Experience	Frequency	Percent
No Experience	1	1.0
Novice	18	18.4
Intermediate	63	64.3
Expert	16	16.3
Total	98	100.0

Table 4.7 displays the results of the item that asked participants to estimate their level of experience with computers. Only one person said that they had no experience, while the number of participants identifying themselves at either extreme of novice and expert was nearly evenly divided with 18% reporting themselves as novice and 16% reporting themselves as expert. The interesting statistic was that a large number of the participants placed themselves in the middle with 64% reporting that they had an intermediate amount of experience with computers. It would warrant additional research to try to determine if this statistic mirrors the general college population or whether students with an intermediate or expert amount of experience were more likely to take blended courses.

Table 4.8
Self-Reported Previous Number of Distance Education Courses Taken

Number of Classes	Frequency	Percent
0	44	44.9
1	15	15.3
2	10	10.2
3	6	6.1
4	13	13.3
5	2	2.0
6	6	6.1
7	1	1.0
10 or more	1	1.0

Table 4.8 shows that breakdown of how many participants in the study had taken a distance education course prior to enrolling in the current blended course. Interestingly, 60% had only taken one or no distance education courses prior to enrolling in the current blended course. It would be an interesting follow up study to see how many participants preferred this course format enough to continue enrolling in blended courses in the future.

Questionnaire Items by Ranked Mean

All items from the questionnaire are reported in tables 4.9 through 4.11 and are ranked from highest to lowest by their mean as reported by the 98 participants in Likert-type scales from 1 to 5, with a 1 meaning "strongly disagree" and a 5 meaning "strongly agree". Items from the three sections are listed in tables 4.9 through 4.11 to provide a good overview of the entire questionnaire. However, section and number within the section are listed in parentheses. It is worth noting that the question that reported the lowest mean was related to whether collaborative activities were better in an online environment than in a face-to-face environment. This seems to indicate that students feel that collaboration is better when it is a face-to-face situation, supporting the concept of the inverted classroom, where material is delivered prior to the class meeting and then the actual class time is spent on collaborative activities.

Table 4.9
(CLSS) Questionnaire Items from Satisfaction Section, Listed by Mean from Highest to Lowest as they were rated by Study Participants

Item Description	N	Mean	SD
1. Overall, the instructor for this course met my learning expectations. (Satisfaction, #10)	98	4.50	.790
2. Overall, this course met my learning expectations. (Satisfaction, #11)	98	4.29	.885
3. This course was a useful learning experience. (Satisfaction, #5)	98	4.20	.952
4. Overall, the learning activities and assignments of this course met my learning expectations. (Satisfaction, #9)	98	4.13	.991
5. My level of learning that took place in this course was of the highest quality. (Satisfaction, #8)	98	4.04	.930
6. As a result of my experience with this course, I would like to take another blended course in the future. (Satisfaction, #4)	98	3.96	1.183
7. Discussions assisted me in understanding other points of view. (Satisfaction, #3)	98	3.96	1.015
8. The diversity of topics in this course prompted me to participate in the discussions. (Satisfaction, #6)	98	3.90	1.079
9. I was stimulated to do additional readings or research on topics discussed online. (Satisfaction, #2)	98	3.57	1.149
10. I was able to learn from online discussions. (Satisfaction, #1)	98	3.42	1.209
11. I put in a great deal of effort to learn the Computer mediated communication system to participate in this course. (Satisfaction, #7)	98	3.34	1.218

It is worth noting that the highest ranked items in this section, as well as the whole survey, focused on satisfaction with the instructors and the courses. This suggests that students in the study did like the blended format. This alone is an important finding for policy makers and administrators. Since satisfaction is an important predictor of students continuing in and completing programs, it suggests that this format is definitely worth pursuing and studying further. In fact, students ranked the statement of wanting to take another blended course very high. Another item worth noting is that students ranked

the statement about learning from discussions relatively low. Since collaboration is an important characteristic of blended learning, this is somewhat of concern and warrants further study. Finally, there is an interesting pattern in this set of questions that merits further investigation in a future study. As the mean decreases in this set of questions, the standard deviation uniformly increases.

Table 4.10
(CLSS) Questionnaire Items from Collaboration Section, Listed by Mean from Highest to Lowest as they Were Rated by Study Participants

Item Description	N	Mean	SD
1. Overall, I am satisfied with my collaborative learning experience in this course.(Collaboration,#8)	98	3.96	1.083
2. Collaborative learning in my group was effective. (Collaborative, #6)	98	3.71	1.005
3. I actively exchanged my ideas with group members. (Collaborative, #3)	98	3.70	1.057
4. I was able to develop new skills and knowledge from other members in my group.(Collaborative,4)	98	3.68	1.080
5. I felt part of a learning community in my group. (Collaborative, #2)	98	3.67	1.063
6. I was able to develop problem solving skills through peer collaboration. (Collaborative, #5)	98	3.60	1.062
7. Collaborative learning in my group was time consuming. (Collaborative, #7)	98	3.11	1.014
8. Collaborative learning experience in the computer mediated communication environment is better than in a face-to-face learning environment. (Collaborative, #1)	98	2.67	1.138

In table 4.10, it is interesting that the highest ranked item again reflected general satisfaction with an aspect of the course, in this case, collaboration. It is interesting that items for collaboration were generally ranked lower than the items reflecting satisfaction with the courses. This could be because the collaborative experiences weren't satisfactory, or possibly didn't happen as much as they should have. It is also important to note that the lowest ranked item in this section suggests that students prefer

collaborating in f2f environments over online, which actually supports the inverted classroom theory discussed in chapter two.

Table 4.11
(CLSS) Questionnaire Items from Social Presence Section, Listed by Mean from Highest to Lowest as they were Rated by Study Participants

Item Description	N	Mean	SD
1. CMC messages are social forms of communication. (Social Presence, #1)	98	3.97	.724
2. Where I access CMC (home, office, computer labs, public areas, etc.) does not affect my ability/desire to participate. (Social Presence, #14)	98	3.85	.923
3. Using CMC is a pleasant way to communicate with others. (Social Presence, #5)	98	3.81	.938
4. I am comfortable participating, even though I am not familiar with the topics. (Social Presence, #9)	98	3.79	.933
5. The language used to express oneself in online communication is easily understood. (Social Presence, #8)	98	3.79	.815
6. The large amounts of CMC messages (numbers of messages and length of messages) do not inhibit my ability to communicate. (Social Presence, #16)	98	3.73	.794
7. It is easy to express what I want to communicate through CMC. (Social Presence, #7)	98	3.71	1.025
8. CMC allows relationships to be established based upon sharing and exchanging information. (Social Presence, #11)	98	3.59	.929
9. CMC is technically reliable (e.g., free of system or software errors that might compromise the reliability of your online messages reaching ONLY the target destination). (Social Presence, #10)	98	3.50	.987
10. The language people use to express themselves in online communication is stimulating. (Social Presence, #6)	98	3.48	.876
11. It is unlikely that someone else might redirect your messages. (Social Presence, #17)	98	3.44	.953
12. CMC messages convey feeling and emotion. (Social Presence, #2)	98	3.28	.939
13. CMC is private/confidential. (Social Presence, #3)	98	3.26	1.039
14. CMC messages are impersonal. (Social Presence, #4)	98	3.21	.933
15. CMC permits the building of trust relationships. (Social Presence, #15)	98	3.21	.955

16. It is unlikely that someone might obtain personal information about you from the CMC messages. (Social Presence, #13)	98	3.17	1.055
17. CMC allows me to build more caring social relationship with others. (Social Presence, #12)	98	3.07	.997

In table 4.11, the highest-ranked items seemed to indicate that students saw computer-mediated communication as social and that they felt comfortable using it as a way to communicate. This is important, because it is such a vital component of blended learning. An equally surprising finding was that two of the lowest-ranked items dealt with whether computer-mediated communication helped to build trust and caring relationships. It might have been because discussion forums in the learning management system are not as dynamic as some of the current social media tools like Facebook, but it is strange that they didn't see online communication as useful for building relationships while at the same time they saw it as social.

Correlational Analysis

The goal set forth in the research questions and the hypotheses was to investigate relationships between the three constructs of satisfaction, collaboration, and social presence, as well as to investigate any relationships between the demographic data and each of the constructs. Using SPSS, the following relationships were explored using the Pearson product-moment correlation coefficient, or Pearson's r. Table 4.12 presents an overview of the correlations that were found to exist between each of the first three hypotheses. The subsequent sections discuss each of these results by individual hypothesis.

Table 4.12
Correlational Matrix for Satisfaction, Collaboration and Social Presence

Measure		Satisfaction	Collaboration	Social Presence
		Students (n = 98)		
Satisfaction	Pearson Correlation	—	.750**	.541**
	Sig. (2-tailed)		.000	.000
Collaboration	Pearson Correlation	.750**	—	.586**
	Sig. (2-tailed)	.000		.000
Social Presence	Pearson Correlation	.541**	.586**	—
	Sig. (2-tailed)	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

Null Hypothesis 1

$H0_1$: There will be no significant correlation between the constructs of perceived social presence and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

Table 4.13 shows that a comparison was made using Pearson's r on the relationship between perceived social presence and reported course satisfaction. The result of the comparison was that 98 participants taking the CLSS shows a significant moderate correlation at p = .000 (r = .541, significant at the 0.05 level, N = 98). We can determine that the correlation is positive since the Pearson correlation coefficient falls between 0 and 1.

Table 4.13
Correlation between Perceived Social Presence and Reported Course Satisfaction

Measure	Statistic
Pearson Correlation	.541**
Sig. (2-tailed)	.000
R^2	.293
N	98

**. Correlation is significant at the 0.01 level (2-tailed).

The coefficient of determination, or R-squares, was then calculated on this correlation by squaring the Pearson's r coefficient. Squaring the correlation coefficient provides a measure of how much variability in one variable can be explained by variation in another. This can help indicate how important a correlation is, because even if there is a correlation, if it only explains a small amount of the variability then it might not be very important (Hinton, 1995). For example, a coefficient of .10 might seem worth mentioning, but the coefficient of determination would only be .01, indicating that .99 of the correlation between two variables was actually due to other factors. Also, while we can *attribute* the variability of one variable to the variability in another variable, we cannot use the coefficient of determination to imply cause and effect (Howell, 2002). This study only explored relationships between variables, and as mentioned before, a correlational study cannot predict a variable based on another variable. The resulting coefficient of determination calculated in this study between reported satisfaction and perceived social presence is .293, indicating that 29% of the total variation in satisfaction can be explained by variation in social presence, with 71% of the variation remaining unexplained.

Sometimes a relationship between variables may not be obvious in a simple linear model provided by the Pearson's r coefficient, where the correlation between the two

variables might not be very high because Pearson's r only indicates how well points fall on a straight line. For this reason, scatterplots provide useful supplemental visual information in correlational analysis because they help detect situations were a researcher mistakenly believes that there was very little relationship between variables because the coefficient was very low or maybe even zero, when actually something like an inverted U pattern might exist which would be just as important to identify. Therefore, SPSS was used to produce a scatterplot to demonstrate the relationship between satisfaction and social presence.

A visual inspection of the scatterplot in Figure 4.7 confirms that the relationship between social presence and satisfaction was positive and linear as demonstrated by the correlation coefficient. Additionally, the variability in the dependent variable (satisfaction) could not be attributed a great deal to variability in the independent variable (social presence) as indicated in the relatively low coefficient of determination. Also, the pattern in the scatterplot shows that data-points were not well-centered on the regression line. The further that the data-points are away from the regression line, the more the scatterplot visually confirms the low coefficient of determination.

In summary, we can say that the first null hypothesis ($H0_{1)}$ is rejected since there is a significant, moderate correlation between course satisfaction and social presence. The 29% of the variability in satisfaction can be accounted for by variability in social presence, with 71% of the variability being attributed to other unknown factors.

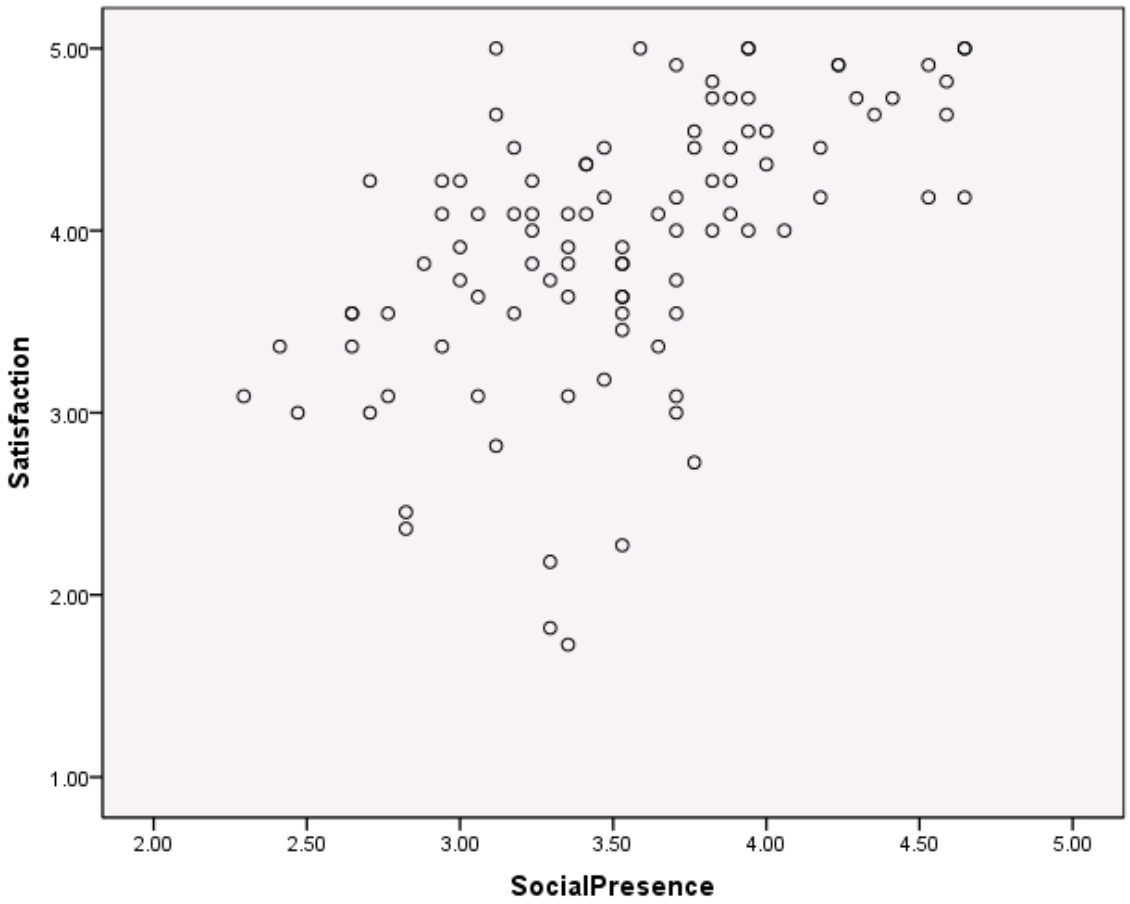

Figure 4.7. Scatterplot for Relationship between Satisfaction and Social Presence.

Null Hypothesis 2

$H0_2$: There will be no significant correlation between the constructs of perceived collaborative learning and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

Table 4.14 shows that a comparison was made using Pearson's r on the relationship between perceived collaboration and reported course satisfaction. The result of the comparison was that 98 participants taking the CLSS shows a significant high

correlation at p = .000 (r = .750, significant at the 0.05 level, N = 98). The correlation is positive since the Pearson coefficient falls between 0 and 1.

Table 4.14
Correlation between Perceived Collaboration and Reported Course Satisfaction

Measure	Statistic
Pearson Correlation	.750**
Sig. (2-tailed)	.000
R^2	.563
N	98

**. Correlation is significant at the 0.01 level (2-tailed).

The resulting coefficient of determination calculated in this study between reported satisfaction and perceived collaboration is .563, indicating that 56% of the total variation in satisfaction can be explained by variation in collaboration, which is a fairly high percentage. 44% of the variation in satisfaction remains unexplained.

A visual inspection of the scatterplot in Figure 4.8 confirms that the relationship between collaboration and satisfaction was positive and linear. In contrast to the relationship between social presence and satisfaction, the variability in satisfaction can be attributed a great deal to the variability in perceived collaboration as demonstrated by much tighter pattern of data-points around the regression line. This coincides with the higher coefficient of determination of .563.

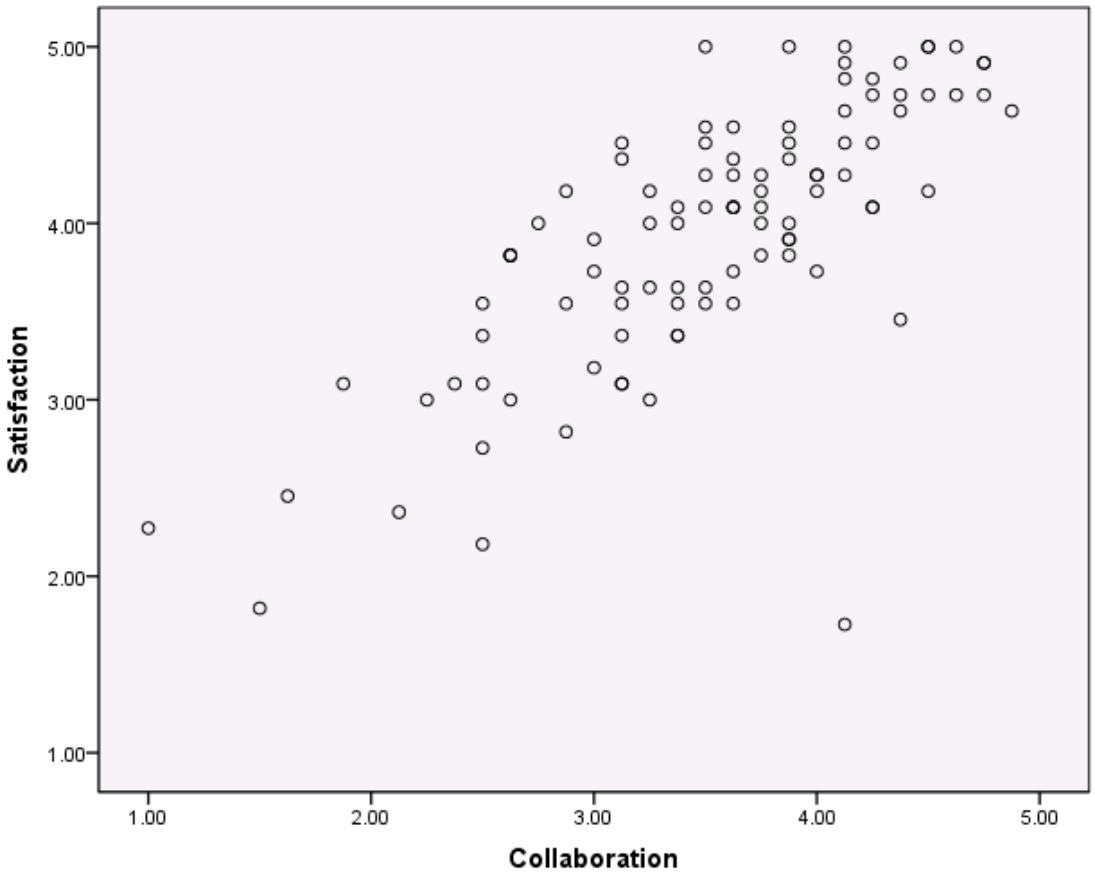

Figure 4.8. Scatterplot for Relationship between Satisfaction and Collaboration.

In summary, we can say that the second null hypothesis ($H0_{2)}$ is rejected since there is a significant, high correlation between course satisfaction and collaboration. The 56% of the variability in satisfaction can be accounted for by variability in perceived collaboration, with 44% of the variability being attributed to other unknown factors.

Null Hypothesis 3

$H0_{3:}$ There will be no significant correlation between the constructs of perceived social presence and perceived collaborative learning as measured by the Collaborative

Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

Table 4.15 shows that a comparison was made using Pearson's r on the relationship between perceived collaboration and perceived social presence. The result of the comparison was that 98 participants taking the CLSS shows a significant moderate correlation at p = .000 (r = .586, significant at the 0.05 level, N = 98). The correlation is positive since the Pearson coefficient falls between 0 and 1.

Table 4.15
Correlation between Perceived Collaborative Learning and Perceived Social Presence

Measure	Statistic
Pearson Correlation	.586**
Sig. (2-tailed)	.000
R^2	.343
N	98

**. Correlation is significant at the 0.01 level (2-tailed).

The resulting coefficient of determination calculated in this study between reported perceived collaboration and perceived social presence is .343, indicating that 34% of the total variation in collaboration can be explained by variation in social presence, which is a moderate percentage. 66% of the variation in perceived collaboration remains unexplained. Although higher than the coefficient of determination between satisfaction and social presence, this value is still relatively low.

A visual inspection of the scatterplot in Figure 4.9 confirms that the relationship between collaboration and social presence was positive and linear. As we saw in the relationship between satisfaction and social presence, since the coefficient of determination is relatively low, the pattern of data-points is not as tight around the

regression line as they were in the scatterplot in Figure 4.8 representing collaboration and satisfaction.

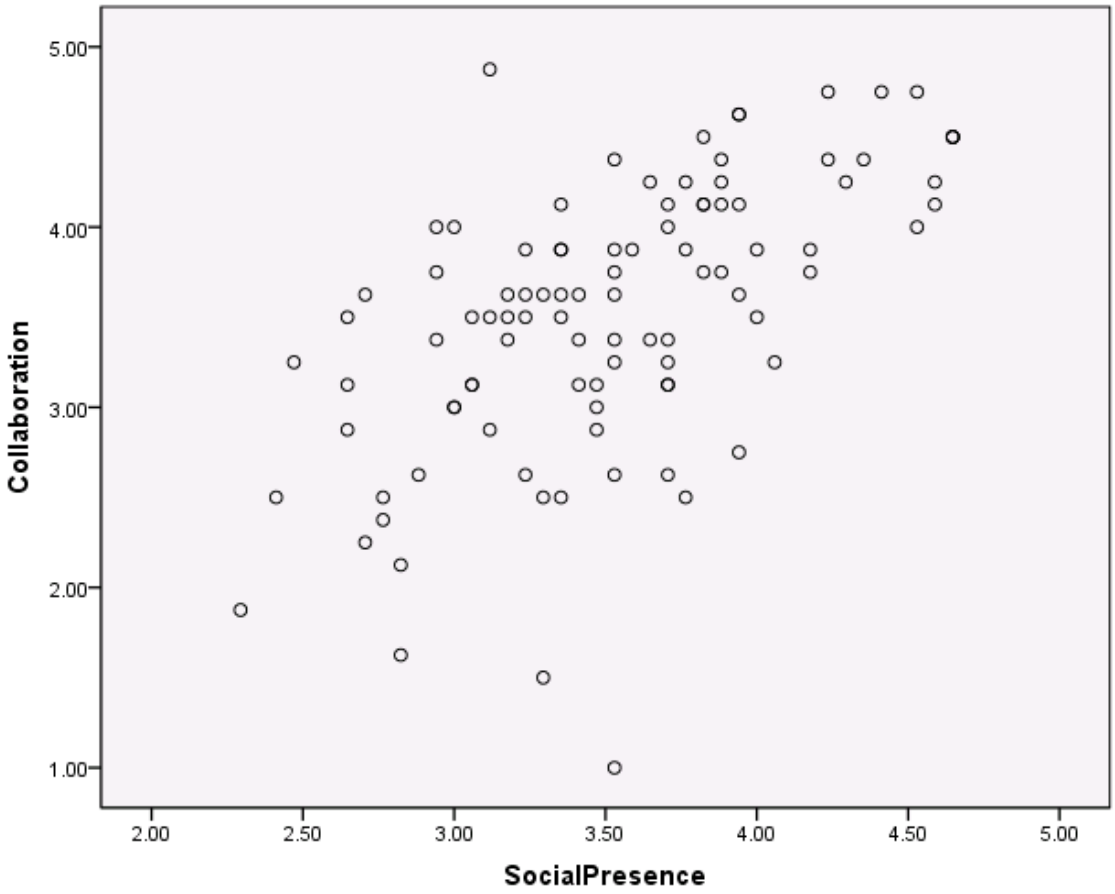

Figure 4.9. Scatterplot for Relationship between Collaboration and Social Presence.

In summary, we can say that the third null hypothesis ($H0_{3)}$ is rejected and since there is a significant, moderate correlation between collaboration and social presence. The 34% of the variability in collaboration can be accounted for by variability in perceived social presence, with 66% of the variability being attributed to other unknown factors.

Null Hypothesis 4

$H0_4$: There will be no significant correlation between student demographic data (gender, age, ethnicity, computer expertise, and number of distance courses previously taken) and the constructs of perceived social presence, perceived collaborative learning, and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire at one community college campus.

The final hypothesis dealt with each of the demographic items and looked at any relationships they might have with the three constructs of perceived collaboration, perceived social presence, and satisfaction. While there were no major findings from the results of the study for *$H0_4$*, there was at least one item of interest that did stand out: the relationship between Latinos and social presence.

SPSS was used to analyze the relationships between the self-reported demographic variables and the three constructs of self-reported course satisfaction, perceived collaboration, and perceived social presence using. This determined if a characteristic such as age had a statistical relationship with a construct such as course satisfaction, for example, which allowed a richer analysis of the data at the conclusion of the study.

Even though a point biserial correlation coefficient (rpb) might have been more appropriate for analyzing the dichotomous variable of gender, it was decided that is was OK to use the Pearson correlation coefficient in SPSS to explore relationships between all demographic variables as long as the dichotomous nature of the gender variable was considered during the data analysis. It was decided at the time of the analysis to not use a correlation coefficient to measure ethnicity, because it was determined that it was a

nominal variable and it might be more appropriate to analyze it with a separate statistical method that will be discussed shortly. The results of the analysis of the relationships between gender, age, experience with computers and previous number of distance education courses taken appear in Table 4.16.

Table 4.16
Relationships between Three Main Variables and Demographic Variables

Variable	Gender	Age	Computer Expertise	# of Distance Courses Taken
Satisfaction				
Correlation	-.120	.220*	.013	.020
Sig. (2-tailed)	.238	.030	.902	.842
R^2	.014	.05	.0002	.0004
N	98	98	98	98
Collaboration				
Correlation	-.146	.235*	-.055	.018
Sig. (2-tailed)	.150	.020	.590	.858
R^2	.021	.055	.003	.0003
N	98	98	98	98
Social Presence				
Correlation	.014	.080	.178	-.006
Sig. (2-tailed)	.889	.431	.079	.956
R^2	.0002	.006	.032	.00004
N	98	98	98	98

Of the items measured in Table 4.16, only two relationships were significant. They were age and satisfaction; along with age and collaboration. Both had a low correlation which was positive, but the coefficient of determination for both was approximately .05, meaning only 5% of the variation in each of the variables could be accountable in the relationship, with 95% being due to unknown factors. So while we technically cannot reject $H0_4$, for all intents and purposes there were no relationships

between these five demographic items and the three constructs that appeared to be worth mentioning or exploring further.

It was determined that it was incorrect to look at a correlation between ethnicity as a whole with the three constructs, since ethnicity cannot be ranked. So the percentage, or frequency, of the number of participants in each group was reviewed. Looking at the descriptive statistics on the breakdown of ethnicity in Table 4.17, it was determined that the samples in most of the ethnic groups with the exception of Latinos and Caucasians were not large enough to do any kind of analysis on.

Table 4.17
Self-Identified Ethnicity of Participants

Ethnicity	Frequency	Percent
African-American	1	1.0
Asian/Pacific Islander	4	4.1
Caucasian	71	72.4
Latino	14	14.3
Other	6	6.1
Not applicable	2	2.0
Total	98	100.0

Though the number was low at 14, it was determined that an analysis could be done on the self-identified Latino participants in the study along with the much larger sample of self-identified Caucasians. A Mann-Whitney U test was conducted in SPSS to compare the self-identified Latino and Caucasian sample groups, as seen in Tables 4.18 and 4.19. It was decided to use a Mann-Whitney U test because the data was ordinal. The Mann-Whitney U test is a non-parametric test that is useful for determining if the mean of two groups are different from each other, and is an alternative to the parametric two-sample t-test. While the mean rank scores were slightly higher for the Latino participants

across the board, the Latino mean rank for the social presence variable stood out over the others.

Table 4.18
Mann-Whitney U Test Ranks for Latino and Caucasain Participants for each Construct

Variable	N	Mean Rank	Sum of Ranks
Satisfaction			
Caucasian	71	42.13	2991.50
Latino	14	47.39	663.50
Collaboration			
Caucasian	71	42.56	3022.00
Latino	14	45.21	633.00
Social Presence			
Caucasian	71	40.18	2852.50
Latino	14	57.32	802.50

Table 4.19
Test Statistics Grouped on the Latino Ethnicity Variable

Measure	Satisfaction	Collaboration	Social Presence
Mann-Whitney U	435.500	466.000	296.500
Wilcoxon W	2991.500	3022.000	2852.500
z	-.729	-.368	-2.378
Asymp. Sig. (2-tailed)	.466	.713	.017

The results from Table 4.19 show that neither of the variables for satisfaction or collaboration was significant in their relationship with the Latino ethnic group. However, the finding suggests that based on the normal approximation, the p-value 0.05 level of significance, there is enough evidence to conclude that there is a difference in the mean ranks of the two ethnic groups in relationship to social presence. A significantly higher score by the Latino participants for perceived social presence appears to have been identified by the study, thus, for Latino participants we fail to reject $H0_4$ only in the

specific situation of stating that there is no relationship between Latino participants and a higher score in perceived social presence. These results warrant further study and analysis on why Latino students may report higher levels of perceived social presence, while not necessarily reporting higher levels of perceived collaboration or course satisfaction than Caucasian students.

In summary, we can say that the fourth null hypothesis ($H0_{4)}$ is retained and that there is no correlation between the demographic variables (excluding ethnicity) and the three constructs. While there did not appear to be any correlations with most ethnic groups and the three constructs, a Mann-Whitney U test did suggest that there might be a significant correlation between self-reporting as a Latino and self-reported perception of social presence.

Summary

This chapter consisted of four sections that describe the process used in the analysis of data: (a) data screening, (b) tests for normality, (c) descriptive statistics of the sample, (d) and correlational analysis. The study collected data through an instrument known as the collaborative learning, social presence, and satisfaction (CLSS) questionnaire. In the study there were initially 108 questionnaires, but 9 were discarded due to non-random answering patterns or being incomplete, and an additional questionnaire was discarded due to an excessive z-score after an analysis of the z-scores on mean of each questionnaire, leaving 98 questionnaires to be analyzed. Several tests for normality were done and it was ultimately determined that the three variables of satisfaction, collaboration and social presence sufficiently approximated normality. The descriptive analysis showed that the sample roughly mirrored the general population of

the college. Two-thirds of the participants were female, the participants were close to being evenly divided between traditional and non-traditional students, and the largest ethnic group was Caucasian with a much smaller group of Latinos representing the second group. The correlational analysis resulted in the first three null hypotheses being rejected, while the fourth was retained.

CHAPTER 5

FINDINGS, CONCLUSIONS AND IMPLICATIONS

This study is comprised of five chapters. The first chapter presented the research problem and was a general introduction to the study and an explanation of its importance. The second chapter presented a review of the literature that is relevant to the study of blended learning, student satisfaction, collaboration, and social presence. The third chapter presented research design and methodology. The fourth chapter presented the analysis of data. This chapter discusses general findings and conclusions based on the analysis of data, as well as the implications of the study and recommendations for possible future research.

Summary of the Study

A goal of the study was to contribute to the growing theoretical framework and empirical research in the field of blended learning at the community college level. The literature review established a theoretical foundation for the study and provided a comprehensive overview of blended learning, the importance of student satisfaction in learning, collaboration theory, and the development of the theory of social presence in distance learning. To tie these areas together, an instructional theory for blended and personal learning known as the Social Cognitive Framework for Blended Learning (SCFBL) was proposed in chapter 2. The SCFBL is a conceptual framework for learning-centered education using blended learning approaches. With the development of the SCFBL, there is a research agenda that can be pursued following this study and eventually it may serve as a guideline to help blended course designers promote those characteristics which this study and future studies indicate are likely to promote student success.

The research problem for this study was to examine the relationships between perceived collaborative learning and social presence with student satisfaction in blended courses at one campus in a community college system.

The following research questions were explored:

1. Does perceived social presence in a blended community college course correlate with reported student satisfaction?
2. Does perceived collaborative learning in a blended community college course correlate with reported student satisfaction?
3. Does perceived social presence in a blended community college course correlate with perceived collaborative learning?
4. How do age, gender, ethnicity, computer expertise and number of distance courses previously taken correlate with perceived social presence, perceived collaborative learning, and reported course satisfaction in a blended community college course?

And the four hypotheses that were tested were:

H1: There will be no significant correlation between the constructs of perceived social presence and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H2: There will be no significant correlation between the constructs of perceived collaborative learning and reported course satisfaction as measured by the Collaborative

Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H3: There will be no significant correlation between the constructs of perceived social presence and perceived collaborative learning as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire in a blended course at one community college campus.

H4: There will be no significant correlation between student demographic data (gender, age, ethnicity, computer expertise, and number of distance courses previously taken) and the constructs of perceived social presence, perceived collaborative learning, and reported course satisfaction as measured by the Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire at one community college campus.

Findings

The findings of this study generally reflected expected outcomes and reported similar findings to those of So & Brush (2008), who used the same instrument as this study. However there were some unexpected surprises in the results of the study which will be discussed below.

Research Question 1

Does perceived social presence in a blended community college course correlate with reported student satisfaction? The answer to the first research question is yes. The study found a significant, moderate positive correlation between perceived social presence and student satisfaction. Since there is significant statistical support for each section of the instrument measuring its respective construct (So and Brush, 2008), it can be said that the two constructs are related. This finding mirrors research that suggests a relationship between social presence and student satisfaction in online learning and

blended learning (Gunawardena, 1995; Gunawardena & Zittle, 1997; Jusoff and Khodabandelou, 2009; Kang & Kang, 2008; Liu, Gomez, Khan, & Yen, 2007; Richardson and Swan, 2003; Tu, 2002; Tu & McIssac, 2002; Whitehead, 2007). Liu, Gomez, & Yen (2009) also found that social presence is a significant predictor of course retention and final grade in the online environments at community colleges.

Research Question 2

Does perceived collaborative learning in a blended community college course correlate with reported student satisfaction? The answer to the second research question is also yes. The study found a significant, high positive correlation between the constructs of perceived collaboration and student satisfaction in the blended courses examined in the study. Since there is significant statistical support that each section of the instrument accurately measures its respective construct (So and Brush, 2008), it can be said that the two constructs are highly related. This finding also mirrors research that suggests a relationship between collaboration and student satisfaction in online learning and blended learning environments (Conrad & Donaldson, 2004; Ferguson and DeFelice, 2010; Garrison and Vaughan, 2008; Jung, Choi, Lim and Leem, 2002; Nummenmaa & Nummenmaa, 2008; Palloff and Pratt, 2007; So and Brush, 2008). However, much of the research tends to point to the correlation between collaboration and enhanced learning, rather than collaborative learning and student satisfaction (Bandura, 1986; LaPoint and Gunawardena, 2004; Roschelle, 1992; Vygotsky, 1978; Wenger, 1998). Tu and Corry (2003) also maintain that we learn through rich social interaction. Shea, Sau Li, & Pickett (2006) state that learning communities play a significant role in academic success and persistence in higher education. The studies that focus on enhanced learning as a result of

collaboration are relevant because it can be assumed that enhanced learning for students leads to satisfaction with the course (Martin & Reigeluth, 1999).

Finally, the researcher found it interesting that the relationship appeared to be much stronger between collaboration and student satisfaction than it appeared to be between social presence and student satisfaction, which is not necessarily what was expected due to the perception that collaborative activities can elicit negative reactions in some learners. (Barkley, Cross and Major, 2005; Kirschner, Sweller and Clark, 2006; Miller, Trimbur, & Wilkes, 1994).

Research Question 3

Does perceived social presence in a blended community college course correlate with perceived collaborative learning? The answer to the third research question is yes. The study found a significant, moderate positive correlation between perceived collaboration and perceived social presence. As stated in the previous two questions, since the instrument has statistical support for measuring each construct (So and Brush, 2008), it can be said that the two constructs are related. This should not be surprising since research has suggested that interactivity is an essential component of social presence (Tu, 2002), and we can safely state that interactivity is increased as a result of collaborative activities. It is important to note, however, that interactivity and collaboration is not the same thing. Vesely, Bloom, & Sherlock (2007) state that it is considered collaboration when members of a community interact towards achieving a common goal of learning.

Other researchers suggest that while social presence may not cause collaboration, it can affect the attitude of participants towards collaborating on a particular task

(Kerwald, 2004; Weinel, Bannert, Zumbach, Hoppe, and Malzahn, 2011; Wise, Chang, Duffy, and del Valle, 2004). Rourke, Anderson, Garrison, & Archer (2001) and Rovai (2002) believe that social presence is also important in the development of a community of learners. So and Brush (2008) found that student perception of social presence correlates to perception of collaborative learning and overall satisfaction. Russo and Benson (2005) found that students' perceptions of their own presence in an online class reinforces the need for interaction in collaborative activities.

Research Question 4

How do age, gender, ethnicity, computer expertise and number of distance courses previously taken correlate with perceived social presence, perceived collaborative learning, and reported course satisfaction in a blended community college course? The answer is that none of the background characteristics are related to any of the three constructs, except for one interesting connection between social presence and one ethnic group that will be discussed shortly. With the exception of this one relationship, the study did not find a significant correlation between any of the demographic variables and the three constructs that were measured. This appears to be somewhat in-line with previous research that did not show any correlation between student satisfaction and student background characteristics such as age, gender, grade level and computer expertise (Kitchen and McDougal, 1998; Yaverbaum and Ocker, 1998).

While research question number four did not generally show any evidence of significant relationships, a highly interesting exception was that a higher rate of perceived social presence was detected in the fourteen participants who identified themselves as

Latino than was found for the much larger group of Caucasian participants. The researcher found this to be very interesting, because while no study could be identified that specifically dealt with connections between social presence and Latinos/Hispanics, it is the researcher's suspicion that there may be cultural characteristics that might cause Latinos to perceive more social presence than their Caucasian counterparts, or to actually create it as a result of the dynamics of their culture. While there is as of yet no strong evidence, this may be the first study that has suggested a higher relationship between Latinos/Hispanics and perceived social presence in blended learning. This could be a very important finding and a very beneficial future direction to take this research as the Latino/Hispanic population continues to increase in the United States and the focus remains on how to help Latino/Hispanic students succeed in learning environments like blended learning.

It is perhaps also just as important of a finding that no relationships were found between any of the other demographic variables and the three constructs, because it suggests that social presence and collaboration equally correlate positively to course satisfaction in blended learning, regardless of variations in demographic variables such as gender, age, or computer expertise.

Conclusions from the Findings

'The findings indicate that there is a strong relationship between the perceived amount of social presence and collaboration in a blended course, and the satisfaction reported by students in that blended course. The major conclusion that can be drawn from this study is to confirm that there does indeed appear to be a strong link between the amount of social presence and collaborative activities that a student perceives in a blended course, and that student's self-reported satisfaction in the course.

The study confirmed that there also appears to be a link between rising levels of perceived collaboration and rising levels of perceived social presence. While collaboration and social presence are theoretically independent variables that affect the dependent variable of self-reported student course satisfaction, there does appear to be a moderate relationship between the amount of perceived collaboration in a blended course and the amount of perceived social presence in a blended course. This suggests that when there is an increasing level of social presence in a blended course, possibly caused by increasing levels of collaboration, that self-reported student satisfaction with the blended course will also increase.

The finding that suggested a possibly higher rate of perceived social presence for Latino students than Caucasian students is intriguing, though it is difficult to draw any hard conclusions from it since there were only 14 participants that were in the group of self-identified Latino students. If this finding of an increased importance of social presence for a specific cultural group can be repeated with a larger sample, then we might be able to explore whether there are significant design issues that could enhance student completion when designing blended courses for groups that are dominated by one or two cultural groups. It also opens the door to the possibility that there may be all sorts of culture-related factors that blended course designers should be aware of when designing a blended course for a targeted cultural group (Asunka, 2008; Hall and Herrington, 2010; Jusoff and Khodabandelou, 2009, Teng, 2005; Tu, 2001; Yen and Tu, 2011; Yildiz, 2009). This appears to reinforce the long-held belief among instructional designers that it is critical to know your audience in advance of designing a lesson for different cultures

(Bentley, Tinney and Chia, 2005; Masoumi and Lindstrom, 2009; Rogers, Graham and Mayes, 2007; Uzuner, 2009).

The main conclusion that can be drawn from this study is that blended learning is an attractive instructional approach that holds great promise for increasing student satisfaction and engagement, which should lead to increased completion and retention in programs. It is a very promising development in education that can be used in many different situations to engage students in learning in ways that we have only dreamed about up to this point. The ability to eventually tailor the learning experience to the unique needs of every single student in a very cost effective way could open up education so that every student can someday receive the kind of education that was once delivered only by expensive private tutors and restricted to only the children of the most wealthy of families.

Implications

As a result of this study, there are several implications for policy makers, blended learning practitioners, administrators and blended learning instructional designers. While we cannot draw any implications based on causality in this study, we can say that it appears that blended learning may indeed be a suitable approach for community colleges, based on the high levels of self-reported student satisfaction. It suggests that the use of blended learning should be encouraged by policy makers. It also appears that if student satisfaction is one goal of the institution or community college system, then policy makers should encourage educational programs that feature collaborative activities and social presence in blended learning. Data from this study can be used to suggest that blended learning featuring collaboration and that social presence can help institutions to create better programs and support services that may lead to more effective learning

environments. The evolution of these highly-effective blended learning environments would happen through iterative cycles of implementation, followed by student evaluations, assessment, action research and program reviews.

For blended learning to reach its potential, a research-based set of guidelines are needed to help policy makers, program/course designers, and facilitators follow practices that have been shown to be effective. Of the blended learning models presented in this study, this researcher argues that the Social Cognitive Framework for Blended Learning (SCFBL) presents the most comprehensive and most effective framework for promoting social presence and collaborative activities that lead to increased student satisfaction and other positive learning outcomes.

One recommendation then, is to not only offer blended learning, but to build ever more effective blended courses using constantly improving technologies and learning-centered instructional methodologies (Liu, Gomez & Yen, 2009). Blended learning courses might include a variety of learning tools such as real-time virtual/collaboration software, self-paced learning materials and social media, in addition to f2f session in a classroom or other meeting area. An effective blended learning program might include inverted classroom techniques using some of the new eLearning tools that have recently opened this strategy up to relatively non-technical instructors, traditional instructor-led learning, synchronous collaborative learning using video-conferencing tools and asynchronous self-paced study using Web 2.0, personal learning environments and learning management systems.

Instruments similar to the CLSS Questionnaire should be included in blended learning programs that will most likely turn increasingly to the use of data-driven

decision making and learning analytics. Learning analytics will play an increasingly important role in education as administrators and teachers begin to use technology and blended learning approaches to personalize education for every student, not just students that are struggling. By combining learning analytics with blended learning at the community college level and the K-12 level, educators will have one of the most powerful tools we have ever seen for engaging students and tailoring their learning experiences to exactly what students need and want, at the time the learning experience is most effective. The potential of combining blended learning with these developments in data-driven decision making has huge implication for education in the near future. It is recommended that as policy makers and administrators begin to consider a larger role for blended learning in their schools and systems, that they approach learning analytics as an essential and integral component that has to accompany blended learning adoption "hand-in-hand".

Picciano's (2009) multimodal model for blended learning suggests that multiple technologies and media should be used to facilitate learning. But Picciano reminds us that instruction is not just about learning content or a skill, but also about providing learners with social and emotional support. The discussion board remains one of the best tools for doing this and for encouraging students to think critically about a topic or issue. In addition to collaboration, encouraging private reflection is a powerful tool for learning, plus sharing reflections with others through tools such as blogs can deeply enrich learning. Garrison and Vaughan (2008) also suggest this cycle of reflection and collaboration. Picciano proposes that joint publication through wikis, asynchronous communication and face-to-face activities can be promote collaborative learning. For

synthesis and assessment of blended learning, Picciano suggests comprehensive papers, multimedia projects, and portfolios.

There does appear to be a significant correlation between collaboration and social presence with student satisfaction in a blended course at the community college level. Therefore, community college practitioners such as blended course designers and instructors should formulate strategies to promote social presence and collaborative learning in blended curriculum. One strategy might be to build highly-structured blended environments that can help with the goal of student retention. If the goal of a program or course is construction of knowledge (Mayer, 2001; 2005) and eventually developing learners who are capable of self-regulated learning or learning in a less structured environment (Zimmerman, 1998), then a highly structured blended course may be exactly what is needed when a learner or group of learners do not have sufficient prior knowledge in a topic or they have a low learning orientation (Kirschner, Sweller, & Clark, 2006). Vrasidas and McIssac (1999) and So and Brush (2008) suggest that when collaborative tasks are well-structured, it leads to increased dialogue and interaction among learners. Computer-supported collaborative learning (CSLC) may be one way to effectively and unobtrusively introduce structure to collaborative activities (Dommel, 2005; Resta & Laferriere, 2007; Stahl, Koschmann, & Suthers, 2006). Collaboration scripts may be an effective way in CSLC and more traditional blended learning environments to encourage interaction and collaboration (Jurado, Molina, Giraldo, Redondo, & Ortega, 2008; Miao, Harrer, Hoeksema, & Hoppe, 2007; Roschelle, 1992).

As new research clarifies the value of the three constructs of social presence, collaboration, and satisfaction, as well as possibly additional constructs, it should help

policy makers and instructional designers to design environments that assist students with developing the skills and aptitudes necessary to successfully complete a blended course. These results have many implications for the strategies that blended course designers can employ to improve student satisfaction and retention at the course level. It also has implications for faculty development programs that teach principles of blended learning design.

One particularly promising strategy might be to focus on networked learning and object-oriented sociality within the blended environment (Conole, Culver, Weller, Williams, Cross, Clark, et al., 2008; Engeström, 2005; Knorr-Cetina, 2001;). The theory of object-oriented sociality maintains that successful social networks aren't really centered on relationships or connections, rather on the value held by learners for certain social objects. This theory appears to be supported by Bandura (1994) who stated that although structural interconnectedness provides potential diffusion paths, it is the psychosocial factors that largely determine what gets diffused through those paths. In other words, it is the social value that is attached to a social object that determines whether a concept is adopted. Rogers & Lea (2005) echo a similar idea when they state that in group collaboration, social identity is the basis upon which social presence is built rather than interpersonal bonds. The practical implication for this line of thought is that blended learning should attempt to build social networks around social objects that hold value and interest for the intended audience. The more interest a social object or idea holds for a group of learners, the more likely that increased social presence and collaboration will result in that group.

To take full advantage of this strategy, for example; blended learning practitioners, policy makers and administrators might work to identify topics that their students are interested in, and then build blended learning courses around those themes, infusing the courses with the subject matter that students need. Using technology, it should be much easier to build these themes into the curriculum and even begin to tailor these interests for students. Incorporating social media into a course would even allow the students to begin to design their own courses according to their unique interests, while still incorporating all of the required content requirements and keeping a strong collaborative element in the f2f portion of the blended courses.

Additionally, Liu, Gomez, Khan, and Yen (2007) and Horton (2011) suggest that learners can be motivated to collaborate and stay engaged in a course by keeping learners interested, energized, and enthusiastic through techniques such as setting clear expectations, requiring commitment, making online courses fun and interesting, providing encouraging feedback, building a learning community and intervening early with unmotivated learners. Kehrwald (2007) asserts that in order to build these connections of collaboration and social presence that the online facilitator must build a strong presence in the course, the presence-building tasks should be included in early course activities, that there should be supportive activities for novice online learners, and that there should be required activities for interpersonal interaction, rather than suggested activities.

Finally, due to the rapidly advancing and disruptively innovative potential of blended learning as described in this study, this researcher envisions the day that "traditional schools" will be replaced by community learning centers which cater to

individuals of all ages, from pre-school to adults. Blended learning will reduce the need for brick and mortar facilities and compartmentalizing students by age, with a hopefully nice side benefit being a change in attitudes where all community members see a need for supporting such facilities because every community member can benefit from them. In addition to being places where students meet for extracurricular activities and face-to-face lessons, these facilities would be places where community members could reach across age and physical barriers to collaborate with learners at other stages of life. Middle school students might work with senior citizens to provide community services and learn from interaction with well-educated, experienced people in the third stage of life. High school students might work with elementary age students in collaborative activities and in ways like reading to them. And to complete the circle, senior citizens might work with children in pre-school to enrich the lives of the senior citizens while providing a critical service to pre-school children by flooding their daily lives with compassionate, patient people who have free time to devote to the needs of small children. In the middle of this, busy working adults might drop into the learning center as well for a quick enrichment class on a hobby or a foreign language. All of this would be part of the collaborative, face-to-face part of public education that strengthens the bonds of a neighborhood or community, while the reflective, personalized part of the blended learning is delivered through technology to pretty much anywhere the learner desires. A strong recommendation by this researcher is that educators, researchers and policy makers begin to explore the potential of such educational facilities in combination with blended learning and analytics. It is inevitable that we will soon begin to see community facilities and programs like this begin to appear.

Limitations

This study was limited to a small rural campus located in an economically depressed section of the southwestern United States, so its findings may not be widely transferable to other communities whose members are more privileged with a variety of options for access to technology. Also, the campus is part of a college system that is not known for being a leader in technology integration or for providing the latest technology to its students. But the college does provide all of the essential elements required for a blended classroom.

The study limits its focus to three constructs in the Social Cognitive Framework for Blended Learning (SCFBL), which are the two independent variables of perceived collaborative learning and social presence, and the dependent variable of self-reported student satisfaction with a blended course. It then examines the relationship between them. There is likely a much richer set of factors influencing student behavior and satisfaction, so this study is a preliminary, limited look at a very small set of constructs in a very dynamic learning situation. The instrument used to measure the constructs of collaborative learning; social presence and student satisfaction may also be somewhat dated in light of the evolving fields of collaboration theory, social presence theory, and blended learning theory.

Because the study focuses on correlation between variables, it will not prove causality. Similarly, finding a correlation between social presence or collaborative learning and student satisfaction will not allow us to state that these two variables predict student satisfaction.

Delimitations

The fact that it is a non-randomized canvass/convenience sample on one small campus in one rural community also limits its generalizability to other settings. The convenience sample size of approximately 100 participants does not provide the ability to generalize over a large population, but it will provide the local community college an idea of where it stands as blended learning begins to take hold in the system.

Further Research

Because it is a relatively new approach, more research is needed on blended learning in general, especially from a perspective of combining self-reflective and collaborative activities. While self-reflective activities weren't explored in this study, they should be contrasted with collaborative activities to see how each correlate to student satisfaction. Specifically, the effectiveness of the Social Cognitive Framework for Blended Learning (SCFBL) framework as a curriculum design model that promotes this balance between self-reflection and collaboration should be investigated.

This study would likely have yielded a much fuller perspective if qualitative data had been included and the study had a mixed-method research design. Further research should include an extensive amount of qualitative research so that we can begin to properly interpret the quantitative data and the interesting trends that we have seen in this study. Adding a qualitative component to future research is highly recommended.

Social presence and collaborative learning research has been conducted in online educational environments (Gunawardena and Zittle, 1997; Moore, 1989; So and Brush, 2008), but until this study, little research had been done on how collaborative learning and social presence affect student satisfaction in a blended learning environment at the community college level. Since the findings indicate that there is a positive correlation in

a blended course between collaborative learning activities and social presence with student course satisfaction it warrants continuing to focus on approaches that strengthen these constructs in a blended-learning community college environment.

The researcher found it interesting that the relationship appeared to be much stronger between collaboration and student satisfaction than it appeared to be between social presence and student satisfaction. This suggests that further research might be warranted to determine whether methods that increase collaboration over social presence are more productive in producing increased student satisfaction.

Furthermore, this study measured social presence as a single construct, rather than breaking social presence down into the sub-constructs that Tu (2002) originally identified: social context, online communication, interactivity, system privacy, and feeling of privacy. Future research should investigate these constructs separately within the larger framework of social presence to see if there are any differences here between online, f2f, and blended learning.

Another facet to explore is how online and face-to-face activities affect the amount of social presence in a blended course. Does social presence result from the face-to-face meetings, or does it develop because of the interactive online activities?

Additional research might be conducted to see if the three types of social presence that Caspi & Blau (2008) identified (social presence as perception of others, social presence as self-projection and social presence as social identification) have varying degrees of effect on the constructs of collaboration and social presence.

More studies are needed on student satisfaction itself to determine what impact satisfaction has on student completion and performance in blended learning. Research

that looks for additional variables that can predict greater student satisfaction is needed and there is a lack of research on social presence for Hispanic students. This should be an area that is explored to see how collaboration and social presence might improve learning opportunities for a group that has sometimes struggled in public school settings. In addition to Latino/Hispanic students, further research might be conducted on whether blended learning improves the success rate of particular groups of underserved students when appropriate collaborative and social presence activities are promoted, along with other constructs that may not have been identified yet.

Finally, further research is warranted to determine if the constructs explored in this study go beyond a positive correlation with student satisfaction in blended learning and can be identified as predicting student satisfaction. Additional research on the effectiveness of collaborative learning and social presence constructs in blended learning to create positive learning outcomes should also be pursued. Also, because the study focused on correlation, additional studies that attempt to predict student satisfaction based on social presence and collaborative learning should be pursued. Research using mixed methodology that goes beyond the quantitative data obtained in this study would also provide a richer and more complete understanding of the dynamics involved.

Summary

While this study did not compare student satisfaction or completion rates of blended learning with the same metrics in face-to-face or online environments, it does ultimately suggest that blended learning is a viable alternative approach to the two traditional approaches in community colleges. Blended learning is just starting to be taken seriously as an instructional approach, however, and it is still in its infancy. Many administrators, instructors and designers do not know how to approach a blended learning

methodology from a learning design perspective and simply view it as a division between face-to-face and online learning spaces. This will undoubtedly improve as more people experiment with blended learning and conduct research that is focused on this approach.

Beyond determining whether blended learning is successful as an instructional methodology, part of this blended learning research agenda will be to determine which characteristics make blended learning designs more successful in respect to student satisfaction, completion rates, and performance. This study demonstrated that there is a relationship between the three constructs of perceived collaboration, perceived social presence, and self-reported student satisfaction in blended learning courses. Its main significance is to show that these constructs are important for blended learning design and should be promoted in learning environments. In addition to these three, there may be many more constructs that promote successful learning environments which will surface in future studies.

While the study focused on a small sample at one community college, it invites further research into whether similar results can be found at other community colleges around the country and whether other factors can be shown to have a relationship with student satisfaction and ultimately, student completion rates. This focus on blended learning methods will likely increase as the pressure on community colleges increases to improve completion rates and prove that their programs are effective in preparing students for the workforce as well as for transfer to four-year universities.

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Appendix A: Quantitative Instrument

The collaborative learning, social presence, and satisfaction (CLSS) questionnaire (So & Brush, 2008).

Instructions: This questionnaire is designed to measure your perceptions on the level of collaborative learning, social presence, and satisfaction. There is no right or wrong answer for each question. However, it is important for you to respond as accurately as possible by checking the most appropriate response.

SECTION 1. GENERAL INFORMATION

1. What is your gender?

__ Female

__ Male

__ Not applicable

2. What is your age?

__ under 18

__ 18–25

__ 26–35

__ 36–45

__ Above 45

__ Not applicable

3. What is your predominant ethnic background?

__ Caucasian

__ African–American

__ Latino

__ Asian/Pacific Islander

__ Other

__ Not applicable

4. Please estimate your level of computer expertise.

__ No experience

__ Novice

__ Intermediate

__ Expert

__ Not applicable

5. How many distance courses have you taken so far? Please circle the number.

0 1 2 3 4 5 6 7 8 9 10 more than 10

SECTION 2. SATISFACTION

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

1. I was able to learn from online discussions. 1 2 3 4 5

2. I was stimulated to do additional readings or research on topics discussed online. 1 2 3 4 5

3. Discussions assisted me in understanding other points of view. 1 2 3 4 5

4. As a result of my experience with this course, I would like to take another blended course in the future. 1 2 3 4 5

5. This course was a useful learning experience. 1 2 3 4 5

6. The diversity of topics in this course prompted me to participate in the discussions. 1 2 3 4 5

7. I put in a great deal of effort to learn the Computer mediated communication system to participate in this course. 1 2 3 4 5

8. My level of learning that took place in this course was of the highest quality. 1 2 3 4 5

9. Overall, the learning activities and assignments of this course met my learning expectations. 1 2 3 4 5

10. Overall, the instructor for this course met my learning expectations. 1 2 3 4 5

11. Overall, this course met my learning expectations. 1 2 3 4 5

SECTION 3. COLLABORATIVE LEARNING

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

1. Collaborative learning experience in the computer mediated communication environment is better than in a face-to-face learning environment. 1 2 3 4 5

2. I felt part of a learning community in my group. 1 2 3 4 5

3. I actively exchanged my ideas with group members. 1 2 3 4 5

4. I was able to develop new skills and knowledge from other members in my group. 1 2 3 4 5

5. I was able to develop problem solving skills through peer collaboration. 1 2 3 4 5

6. Collaborative learning in my group was effective. 1 2 3 4 5

7. Collaborative learning in my group was time consuming. 1 2 3 4 5

8. Overall, I am satisfied with my collaborative learning experience in this course.1 2 3 4 5

SECTION 4. SOCIAL PRESENCE

The following questionnaire has been developed to investigate your attitude toward Computer-Mediated Communication (CMC), including email, Threaded Discussion, and Real-Time Chat. You are to consider your course-related use of CMC only. You will be presented with a statement about CMC and then will select the appropriate response listed under each statement. The following descriptions apply to the entire questionnaire:

E-Mail: Electronic messaging system that permits communicating.

Threaded Discussion: Computer-based environments in which messages are ‘posted’ and read by users who may or may not be logged on simultaneously. It is required that the users must access the discussion boards to participate.

Real-Time Chat: Computer-based environments in which users communicate simultaneously.

Please read each statement carefully; then indicate the degree to which you Agree/Disagree with the statement as it relates to CMC, by selecting the appropriate answer.

Strongly

Disagree

Disagree Neutral Agree Strongly

Agree

1. CMC messages are social forms of communication. 1 2 3 4 5

2. CMC messages convey feeling and emotion. 1 2 3 4 5

3. CMC is private/confidential. 1 2 3 4 5

4. CMC messages are impersonal. 1 2 3 4 5

5. Using CMC is a pleasant way to communicate with others. 1 2 3 4 5

6. The language people use to express themselves in online communication is stimulating. 1 2 3 4 5

7. It is easy to express what I want to communicate through CMC. 1 2 3 4 5

8. The language used to express oneself in online communication is easily understood. 1 2 3 4 5

9. I am comfortable participating, even though I am not familiar with the topics. 1 2 3 4 5

10. CMC is technically reliable (e.g., free of system or software errors that might compromise the reliability of your online messages reaching ONLY the target destination). 1 2 3 4 5

11. CMC allows relationships to be established based upon sharing and exchanging information. 1 2 3 4 5

12. CMC allows me to build more caring social relationship with others. 1 2 3 4 5

13. It is unlikely that someone might obtain personal information about you from the CMC messages. 1 2 3 4 5

14. Where I access CMC (home, office, computer labs, public areas, etc.) does not affect my ability/desire to participate. 1 2 3 4 5

15. CMC permits the building of trust relationships. 1 2 3 4 5

16. The large amounts of CMC messages (numbers of messages and length of messages) do not inhibit my ability to communicate. 1 2 3 4 5

17. It is unlikely that someone else might redirect your messages.

Appendix B: Combined Ranking for CLSS Items

Collaborative Learning, Social Presence, and Satisfaction (CLSS) Questionnaire Items, Listed by Mean from Highest to Lowest as they Were Rated by Study Participants

Item Description	N	Mean	SD
1. Overall, the instructor for this course met my learning expectations. (Satisfaction, #10)	98	4.50	.790
2. Overall, this course met my learning expectations. (Satisfaction, #11)	98	4.29	.885
3. This course was a useful learning experience. (Satisfaction, #5)	98	4.20	.952
4. Overall, the learning activities and assignments of this course met my learning expectations. (Satisfaction, #9)	98	4.13	.991
5. My level of learning that took place in this course was of the highest quality. (Satisfaction, #8)	98	4.04	.930
6. CMC messages are social forms of communication. (Social Presence, #1)	98	3.97	.724
7. Overall, I am satisfied with my collaborative learning experience in this course. (Collaboration, #8)	98	3.96	1.083
8. As a result of my experience with this course, I would like to take another blended course in the future. (Satisfaction, #4)	98	3.96	1.183
9. Discussions assisted me in understanding other points of view. (Satisfaction, #3)	98	3.96	1.015
10. The diversity of topics in this course prompted me to participate in the discussions. (Satisfaction, #6)	98	3.90	1.079
11. Where I access CMC (home, office, computer labs, public areas, etc.) does not affect my ability/desire to participate. (Social Presence, #14)	98	3.85	.923
12. Using CMC is a pleasant way to communicate with others. (Social Presence, #5)	98	3.81	.938
13. I am comfortable participating, even though I am not familiar with the topics. (Social Presence, #9)	98	3.79	.933
14. The language used to express oneself in online communication is easily understood. (Social Presence, #8)	98	3.79	.815
15. The large amounts of CMC messages (numbers of messages and length of messages) do not inhibit my ability to communicate. (Social Presence, #16)	98	3.73	.794
16. It is easy to express what I want to communicate through CMC. (Social Presence, #7)	98	3.71	1.025
17. Collaborative learning in my group was effective. (Collaborative, #6)	98	3.71	1.005
18. I actively exchanged my ideas with group	98	3.70	1.057

members. (Collaborative, #3)			
19. I was able to develop new skills and knowledge from other members in my group. (Collab, #4)	98	3.68	1.080
20. I felt part of a learning community in my group. (Collaborative, #2)	98	3.67	1.063
21. I was able to develop problem solving skills through peer collaboration. (Collaborative, #5)	98	3.60	1.062
22. CMC allows relationships to be established based upon sharing and exchanging information. (Social Presence, #11)	98	3.59	.929
23. I was stimulated to do additional readings or research on topics discussed online. (Satisfact, #2)	98	3.57	1.149
24. CMC is technically reliable (e.g., free of system or software errors that might compromise the reliability of your online messages reaching ONLY the target destination). (Social Presence, #10)	98	3.50	.987
25. The language people use to express themselves in online communication is stimulating. (Social Presence, #6)	98	3.48	.876
26. It is unlikely that someone else might redirect your messages. (Social Presence, #17)	98	3.44	.953
27. I was able to learn from online discussions. (Satisfaction, #1)	98	3.42	1.209
28. I put in a great deal of effort to learn the Computer mediated communication system to participate in this course. (Satisfaction, #7)	98	3.34	1.218
29. CMC messages convey feeling and emotion. (Social Presence, #2)	98	3.28	.939
30. CMC is private/confidential. (Social Presence, #3)	98	3.26	1.039
31. CMC messages are impersonal. (Social Presence, #4)	98	3.21	.933
32. CMC permits the building of trust relationships. (Social Presence, #15)	98	3.21	.955
33. It is unlikely that someone might obtain personal information about you from the CMC messages. (Social Presence, #13)	98	3.17	1.055
34. Collaborative learning in my group was time consuming. (Collaborative, #7)	98	3.11	1.014
35. CMC allows me to build more caring social relationship with others. (Social Presence, #12)	98	3.07	.997
36. Collaborative learning experience in the computer mediated communication environment is better than in a face-to-face learning environment. (Collaborative, #1)	98	2.67	1.138