University of Cincinnati

Date: 2/3/2014

I, Sasikumar Benzigar, hereby submit this original work as part of the requirements for the degree of Doctor of Education in Curriculum & Instruction.

It is entitled:
A Survey Study of the Association between Perceptions of Interactions, Learning and Satisfaction among Undergraduate Online Students

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A Survey Study of the Association between Perceptions of Interactions, Learning and Satisfaction among Undergraduate Online Students

A dissertation submitted to the
Graduate school
of the University of Cincinnati
in partial fulfilment of the
requirement for the degree of
Doctor of Education

in the Department of Curriculum and Instruction
of the College of Education
by

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M.Ed. University of Cincinnati
April 2014

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Abstract

Undergraduate students’ perceptions of their presences in online learning environments are critical in creating online courses that can best enhance their learning. Hence, understanding how learners perceive their presences in the online environment could assist course designers and instructors in creating quality online learning experiences. The purpose of this study was to explore (1) the perceptions of undergraduate students regarding teaching, social and cognitive presences in online courses and (2) to determine the differences characterizing undergraduate students’ perceptions of teaching, social and cognitive presences in online courses based on their age, gender, class standing, online experience, course enrollment, and course duration.

This study used the Community of Inquiry (CoI) framework to explore undergraduate online students’ perceptions of teaching, social and cognitive presences in relation to their learning and satisfaction in the online environment. Data were gathered using a non-experimental CoI survey, with additional demographic questions, from approximately 600 undergraduate online students from the College of Public Health at Kent State University. Descriptive and non-parametric inferential statistical methods were used to analyze student responses from this survey.

Results showed that most of the undergraduate students had positive perceptions about the presences in online learning. They had positive perceptions about their interactions with other participants, instructor and course content, and they preferred timely, specific and constructive feedback from their instructors. Very few students thought that knowing other students personally gave them a sense of belonging in these courses. These undergraduate students also had significant differences in their perceptions of some of the social and cognitive presence
aspects based on their demographic characteristics of age, online learning experience, enrollment, and course duration. They had difference of opinions on discussions and the collaboration aspects of their learning as well as on the course material and the usefulness of those materials for their learning. Class standing and course enrollment had no influence on their perceptions of their social, teaching and cognitive presences.

Based on the results of the study, the researcher provides online instructional designers and instructors with some implications for practice and recommendations towards creating quality online learning environments for undergraduate students. Implications for practice address the course design, interaction and course delivery aspects of online courses. Recommendations for future research are also offered.
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This work is dedicated to my mom and dad, wife Maggie and to our children Angela and Ethan, for their caring love and support.
ACKNOWLEDGEMENTS

I am appreciative of the guidance and encouragement from many people throughout the process of completing my dissertation.

First of all, I would like to thank my committee, Dr. Carla Johnson, Dr. Piyush Swami, Dr. Wayne Hall and Dr. Vinay Cheruvu for all their guidance, feedback, support and encouragement.

My sincere gratitude goes to Dr. Thomas Brewer and the College of Public Health for their support and encouragement of this research. Special thanks to the students who participated in this study.

Finally, I would like to express my sense of gratitude to my family and friends for supporting and encouraging me with their best wishes.
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Teaching Presence

Social Presence

Cognitive Presence

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CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

Growth in online learning

Online learning is seeing a steady growth in enrollment over the first decade of the 21st century. According to the 2011 National Center for Educational Statistics report, from 2000 to 2008, the percentage of undergraduates enrolled in at least one distance education course expanded from 8 percent to 20 percent, and the percentage enrolled in a distance education degree program increased from 2 percent to 4 percent (Radfor, 2011). Recent enrollment data shows a much faster growth rate for online learning compared to total higher education enrollment (Allen & Seaman, 2010).

Development of online learning has provided an opportunity for those institutions that have traditionally brought students to their campuses now to reach new student constituents (M. G. Moore & Anderson, 2003). Furthermore, online learning allows schools to expand education to reach diverse faculty and student populations, including students with physical disabilities, by giving them access to higher education without any time or space constraints (Mayne & Qiang, 2011; D. C. Powell, 2007). Because of the growing online student population, higher education institutions are requiring most of their instructors to develop and teach online courses to provide their students with an online learning option (Bolliger & Shepherd, 2010).

Definitions of terms

The terms online learning and distance learning are sometimes used interchangeably. However, online learning is a form of education that uses technology to provide non-traditional students access to higher education (J. L. Moore, Dickson-Deane, & Galyen, 2011). In online
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learning environments, teachers and students are in different places and they use some form of technology to interact with each other (M. G. Moore, 2011). In contrast, distance learning can include both online and offline delivery formats.

Terms used in this study are defined to provide more clarity and consistency for the discussions and analyses. These definitions are limited to this study (its participants, settings and results) and were created by the principal investigator, unless otherwise noted:

**Face-to-Face (F2F):** A method of traditional learning, where the instructor and learners meet on a regular basis in a campus location.

**Online learning:** A learning method where no F2F meetings are scheduled. Students complete 100% of the work (lectures, assignments, assessments) online.

**Distance Learning/Distance education:** A learning method where no F2F meetings are scheduled. Student will complete 100% their work through online or offline delivery methods.

**Learning:** Interactions among instructor, students and content for the purpose of confirming and constructing knowledge (adapted from (Garrison, 2011)).

**Learning environment:** The space and setting where learning happens.

**Collaboration:** Students working with other students in their learning environment to improve their understanding of the topics and learning materials provided to them.

**Interactions:** Communication among instructor, students and content for the purpose of collaboration and learning.

**Perceptions:** Students’ views or thoughts on the elements of the learning environment.
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**Presence:** A sense of being or identity created through interpersonal communication (Garrison, 2011, p. 22).

**Social Presence:** A sense of identity created through student-student interactions in the learning environment.

**Teaching Presence:** A sense of identity created through instructor – student interactions in the learning environment.

**Cognitive presence:** A sense of identity created through student – content interactions in the learning environment.

**Satisfaction:** Evaluation by students about the quality of the learning experience (M. G. Moore & Anderson, 2003).

**Characteristics of online learning**

Online learning has come a long way from postal and video based correspondence learning to dynamic, online environments where students can collaborate and learn using a variety of synchronous and asynchronous methods. With the increased student interest and enrollment in online learning, the conversation about the quality of online learning is gaining increasing importance among higher education institutions, instructors and researchers. According to a 2006 study, the goal of designing a quality online learning environment should not be to create a copy of the traditional Face-to-Face (F2F) experience, but instead to create an online learning experience that can achieve the same learning goals with different learning strategies and methods (Stodel, Thompson, & MacDonald, 2006).
Summarizing the major best practices in online learning, Thomson (2010) points out that a good quality online learning environment is one that provides opportunity for students to interact and learn from the material provided and also from each other. A lot of thinking needs to go into developing a quality online learning environment. In these environments the right strategies should be identified and implemented to “motivate the learner, facilitate deep processing, build the whole person, cater to individual differences, promote meaningful learning, encourage interaction, provide relevant feedback, facilitate contextual learning, and provide support during the process” (Anderson, 2008).

To identify the successful strategies for online learning, it is important for the online course designers and developers to know and understand the learners and the environment before they begin the process to create the online learning environments. There is a lot to understand about the curriculum, teaching strategies and delivery methods. However, the primary focus should be on student participation and also creating and implementing strategies that would encourage participation in the online learning environment (M. G. Moore, 2011, p. 113). This study will explore students’ perceptions of teacher, student and content interactions so as more fully to consider students’ input as a factor towards improving their educational experiences in the online learning environment.

Features of quality online learning environments

Quality online teaching and learning environments start with good course design practices and follow recommendations and practices grounded in teaching and learning research. Quality Matters (QM) is one of the more popular learning standards used for online course designs. More than 300 institutions have adapted QM standards for their online course design because of the
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greater student interactions it brings to the online learning environment (Swan, Matthews, Bogle, Boles, & Day, 2012). QM offers guidelines and standards on course overview and introduction, learning objectives (competencies), assessment and measurement, instructional materials, learning interaction and engagement, course technology, learner support and accessibility areas. It suggests design principles that are essential to create a quality online learning environment. These principles encourage interactions among students, instructors and content for the purpose of collaboration and learning. The courses in this study were designed and delivered based on QM standards.

QM standards for online learning go through regular revisions based on current research findings as well as on a faculty peer review process for designing and evaluating online courses. An understanding of students’ perceptions of their interaction experiences in online courses would further strengthen such a process by providing new knowledge about students’ thoughts and perspectives on their learning environments.

Interactions in Online Learning

Moore (2011) describes the components of distance learning as presentation and interaction. He explains presentation as the phase where course materials are designed and distributed to the students, while the interaction phase is where the students interact with the instructor, content and other students. Online interactions play a major role in keeping students engaged in the learning process and should focus on helping students to collaborate and learn. The quantity of interactions online students have with the content, instructor and their peers should be focused on creating a quality learning environment. These interactions provide the “pedagogical foundation” for the learning process (Gosmire, Morrison, & Osdel, 2009). The learning process
of confirming and constructing knowledge requires these interactions to foster collaboration among students, instructor and course content.

Interactions in online learning should be incorporated into the learning process and activities in the environment. Student-student interaction should help students collaborate with their peers. Teacher-student interaction should focus on creating, facilitating and sustaining learning. Importantly, student interaction with the content and learning activities should help them with their self-assessment and learning. All the interactions should be created with the purpose of helping students collaborate and learn in the online learning environment.

For these reasons, course designers and instructors should think about integrating the right mix of interactions to create a successful learning environment that helps students to collaborate and learn (Anderson, 2003). To be meaningful in the learning environments, these interactions should influence students’ meaning making and increase their learning (Woo & Reeves, 2007).

There are many factors that may influence the extent and nature of interaction in a given learning environment. These include “designers’ teaching philosophy, the nature of the subject matter, the maturity of the students, their location, and the technology used in the course” (M. G. Moore, 2011, p. 16). An understanding of students’ perceptions of these interactions would be helpful to improve their learning experiences in the online learning environment.

**Perceptions in Online Learning**

Students’ perceptions seem to predict how they learn in the online learning environment (Picciano, 2002). Faculty and student perceptions should be considered to identify and use learning interactions in the online learning environment to enhance students’ learning experiences. Faculty perceptions play a major role in course design and teaching strategy
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decisions (Osborne, Kriese, Tobey, & Johnson, 2009). That being the case, an awareness of students’ perceptions of online learning will help instructors to make pedagogical decisions to address student expectations (Osborne et al., 2009). It is important to understand student perceptions of interactions because students’ perceptions of interaction in online learning are significantly related to their perceived performance (Picciano, 2002).

Community of Inquiry (CoI) Theoretical framework
A study of students’ perceptions of online interactions should be based on a comprehensive and sound theoretical framework that involves all interdependent elements of interactions and learning. CoI is one of the popular theoretical frameworks used for studying students’ perceptions in online and hybrid learning environments in recent years (Akyol, Arbaugh, et al., 2009; Arbaugh, 2008; Arbaugh et al., 2008; Garrison, Anderson, & Archer, 2010). It is based in part on the educational philosophy of John Dewey, who believes that "education is a collaborative reconstruction of experiences” (Garrison, 2011, p. 10). The CoI framework represents a process of creating meaningful online learning experiences through the development of three interdependent interaction elements, namely: social presence, teaching presence and cognitive presence. This study will use the CoI framework to explore undergraduate students’ perceptions of interactions in online courses. For the purposes of this study, social, teaching and cognitive presences in the framework will be interpreted as students’ thoughts on their educational experiences of student-student, student-teacher and student-content interactions in the online learning environment.

Statement of the Problem and need for the study:
There is a growing need to study the perceptions of undergraduate online students to advance our understanding of their views and thoughts of interactions in the online learning environment.
First, the research has revealed alignment issues between instructor and student perceptions regarding the effectiveness of online course delivery (Seok, DaCosta, Kinsell, & Tung, 2010). Current research in this area has also showed that a large number of studies have been done with graduate courses. Compared to undergraduates, graduate students may prefer more teaching and cognitive presences in their online learning environments (Kumar, Dawson, Black, Cavanaugh, & Sessums, 2011). Undergraduates, by contrast, might prefer more social and teaching presences to guide them in the learning process. So there is a need to study undergraduate students’ perception of online interactions to see the levels of presences they prefer in their online learning environments.

Also, different disciplines use different teaching strategies and methods that may affect the presences and how those students collaborate and learn (Arbaugh, Bangert, & Cleveland-Innes, 2010; Cassidy et al., 2008). It is important to study undergraduate students’ perceptions of these online learning environments from different disciplines to gain more understanding to improve and accommodate inputs that are discipline specific (Arbaugh, 2008, 2010).

There are a number of studies over the past decade looking at students’ satisfaction with online learning (Lee, 2010; Lu & Chiou, 2010; Rochester & Pradel, 2008; Wickersham & McGee, 2008; Wyatt, 2005; Young & Norgard, 2006). However, there is very minimal research focused on students’ perceptions of student, teacher and content interactions in a compressive way to study the influence of these interactions in their learning (Garrison & Arbaugh, 2007; Shea & Bidjerano, 2010). Moreover, most of the studies up until now have focused on the individual interaction components and how those relate to students’ satisfaction (Shea, Hayes, et al., 2010). Furthermore, these studies have heavily relied on qualitative methodologies and content analysis of the text-based interaction from discussion forums in the online learning
environment (Arbaugh et al., 2008; Garrison, Cleveland-Innes, & Fung, 2010). There is a need to study student perceptions of all these interactions quantitatively to understand the influence of these interaction components in these learning experiences in the online learning environments.

It is also important to examine the potential influence of age, gender and other demographic and course related variables on students’ perceptions of online interactions (Mortagy & Boghikian-Whitby, 2010). It is a known fact that the younger generations of students have more exposure and access to technology (Orellana, 2006). Because of that, we might well see a difference in perceptions of students from these different age groups (Mortagy & Boghikian-Whitby, 2010).

There is a growing need for more research in this area to advance our understanding of online learning in higher education. We already have some understanding through current research and best practices for creating quality online courses. However, online researchers believe that there is still much to understand regarding students’ perceptions of student, teacher and content interactions in the online learning environment (Garrison, 2011). So we need studies to look at differences in undergraduate students’ perceptions based on their age, gender, online learning experience, class standing, course enrollment and course duration. The data and findings from this study will help instructors to improve their course designs to accommodate inputs from undergraduate students. It will help them to redesign their online courses to enhance learning in that environment.

**Significance of the study**

The Babson Survey Research Group’s 2011 report on online learning showed that the number of students taking at least one online course has now surpassed 6 million (Allen & Seaman, 2011).
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The report also points out that one-third of all students in higher education are taking at least one online course in any academic year. With more and more on-campus students taking online courses, it is important to explore the differences in undergraduate students’ perceptions of interactions.

This study will explore undergraduate students’ perceptions of the role of teacher, student and content interactions in the online learning environment. The significance of this study is in its attempt to focus specifically on undergraduate student’s perceptions of interactions in an online learning environment. This study will provide valuable insights into the way instructors could improve their online course designs to enhance undergraduate students’ learning in that environment. This study will also provide more information to advance our knowledge about the changing demography of online students and the differences, if any, in their perceptions of the online learning environments based on age, gender, class standing, online learning experience, course enrollment and course duration.

Specific research questions

The following questions were developed based on the CoI model to contribute to existing research on students’ perceptions of interactions in online learning. This study will look at the following two major questions:

1. What are the perceptions of undergraduate students regarding teaching, social and cognitive presences in online courses?

2. What are the differences in undergraduate students’ perceptions of teaching, social and cognitive presences in online courses based on their age, gender, class standing, online experience, course enrollment, course duration?
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Summary:

This chapter provides an overview of the statement of the problem. It proposes the use of the CoI framework to gain a comprehensive understanding of the complex interactions happening in the online learning environment. It provides an overview of current research findings and highlights the need to look at the whole online learning process. It also claims the need for the awareness of students’ perceptions of online teaching and learning, and it raises questions of learner diversity and the effects of age, gender and online learning experiences in the perceptions of current online learners.
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CHAPTER 2

REVIEW OF LITERATURE

Higher education institutions are seeing a significant enrollment growth in online learning environment compared to their traditional educational offerings. Enrollment data from the fall 2010 term shows that more than 6.1 million students were taking at least one of their courses online, almost a 10% increase over the number reported for the previous year (Allen & Seaman, 2011). Ubiquitous and easy access to the web in the developed countries has made it easy for the students to embrace online learning environments without any issues (Anderson, 2008). Because of these reasons, many institutions now offer online options for their students with the use of learning platforms and instructional technologies.

To accommodate the growing online enrollment, higher education institutions are doing their best to create online learning environments with available resources. To design quality online learning environments, it is important for them to know “the principles of learning and how students learn in the environment” (Anderson, 2008, p. 18). Knowing students’ perceptions of the learning environment and interactions will provide essential understanding to design such student focused learning environments. The purpose of this study was to explore students’ perceptions of interactions in the online learning environment. The review of literature will summarize the concepts of interactions and the role of students’ perceptions of social (with peers), teaching (with instructor) and cognitive (with content) interactions in the online learning environment.
Emergence of online learning

Online learning is not a new phenomenon; it has changed significantly with the improvement of technological innovations and availability. However, looking back at the history shows that a distance learning, a form of online learning began long ago with whatever methods of delivery were available for instruction at that time. It began with the correspondence study method where instruction was delivered with printed materials through regular mail (M. G. Moore, 2011). The delivery methods have subsequently and naturally changed based on the availability and feasibility of technological resources. Moore (2011) went on to categorize the changes in distance learning delivery methods based on the stages of development as follows:

- **1st generation – correspondence:** Courses were delivered by mail. This method provided a learning option for students who wanted to learn from home (p.23)

- **2nd generation – Broadcast radio and television:** courses were offered through radio and television broadcasting (p. 29)

- **3rd generation – open universities:** This generation introduced the first systems approach to distance learning, creating a pathway for instructional designs and learning theories to support the design and teaching of distance learning courses (p.31)

- **4th generation – teleconferencing:** an interactive learning approach was introduced that could connect instructor and learners through audio and video conferencing solutions (p. 35)
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- 5th generation – internet/web: Students and instructors interacted through internet enabled interaction and collaboration tools within internet/web-based virtual courses (p. 40)

Distance learning has thus gone through different stages before the invention of the internet/web technologies used for delivery of instruction and communication in the current online learning environment.

**Online learning options for university courses:**

Online learning has benefits for both students and higher education institutions. It is suggested, for instance, that online learning that focuses on learners and learning will provide great benefits to students through its flexible 24/7 learning environment (Anderson, 2008). The level of acceptance of online learning among students has also undergone a positive shift in the later part of the last decade. It is argued that the students were increasingly appreciative of online learning because of the collaborative course activities and the expectation of critical thinking skills being developed in the online learning environment (Mortagy & Boghikian-Whitby, 2010). In addition to providing opportunities for students to take advanced courses from any institution anywhere in the world, online learning opens up the possibilities for to explore new modes of learning (Thomson, 2010).

At the same time traditionally on-campus institutions are reaching out to new student populations with their online learning options. Even with enrollments for traditional learning options leveling off, online learning is seeing a significant growth over the second part of the last decade (Allen & Seaman, 2010). Traditionally on-campus institutions are thus increasingly
moving towards a dual mode delivery system to provide the online learning options desired by their students.

**Benefits of distance learning for higher education institutions:**

Distance learning is gaining more attention because of the value it brings to the campus based institutions. It helps them to serve students from their own communities, as well within national and international contexts. Moore and Kearsley (2011), in compiling a list of ideas on how distance learning could help the higher education institutions reach a wide range of traditional and non-traditional students, provide many different ways distance learning could complement the campus based educational reach through cost effective delivery methods. Their suggested list of benefits includes:

- Increasing *access* to learning and training as a matter of equity
- Providing opportunities for *updating* skills of the workforce
- Improving the cost *effectiveness* of educational resources
- Improving the *quality* of the existing educational structures
- Enhancing the *capacity* of the educational system
- Balancing *inequalities* between age groups
- Delivering educational campaigns to specific *target audiences*
- Providing emergency training for *key target groups*
- Expanding the capacity for education in the new *subject areas*
- Offering combination of education with work and *family life*
- *Adding an international dimension* to the educational experience (p. 8)
Online learning has great potential to provide global access to traditional higher education, training and workforce development, without any time and space constraints, while serving this wider range of students in a more economical and cost effective way. With the use of educational technologies, online learning is also enhancing social engagement through interactions without any geographical boundaries (Garrison & Cleveland-Innes, 2005; MacLeod, 2010).

**Online learning and learning management systems:**

Initially, internet and web technologies were used in higher education for communication and to supplement on-campus and correspondence education. With recent technological innovations, institutions are using the same internet technology infrastructure to deliver both on-campus and online learning courses. Even though on-campus and online learning use the same infrastructure, the use of tools and the delivery methods may vary based on the learning environment.

With the emergence of Learning Management Systems (LMS), an integrated system with tools and technologies to deliver instruction through the web has become a reality. LMS systems like Blackboard, Desire2Learn and others have integrated interaction and collaboration tools to create virtual classrooms for online teaching and learning needs. Open source, community supported LMS systems like Moodle and Sakai offer cost effective options for smaller institutions to use the same technologies for their teaching and learning needs. All of these LMS systems provide discussion forums and other communication tools for interaction among students and instructors. Initially, most of the institutions used these LMS systems to supplement their traditional learning methods. The existing LMS infrastructure may be one of the driving forces for the fast adoption of online learning options in higher education.
Other web based collaboration tools, collectively known as web 2.0, are also available for online interaction and collaboration. Web 2.0, even though based on the internet, is seen as an extension of internet technologies with its social networking and shared virtual commenting features (Anderson, 2008). Some of the educational tools in this category include blogs, wikis, podcasts etc. A number of these tools are integrated into the new updates of the LMS systems, and most of these tools are used to implement interaction and collaboration among online learners.

**Communities in Online learning**

In the online learning environments, students learn from the content presented to them, and also from their interactions and collaborations with their peers. Descriptions of such environments have developed new terms for such interactions, including communities of inquiry, communities of learners, and knowledge-building communities (Picciano, 2002). Students’ interaction with other participants creates a sense of a learning community within the online learning environment. To get a clear understanding of the interactions and collaborations that take place within the online learning environment, we must look at the meaning of a “community” in that environment, where a typical learning community might be described as "a group of people, who are voluntary members with varying experience of equal value, that are constantly learning together in order to solve problems" (Jézégou, 2010).

In the higher education environment, learning community takes a slightly different meaning putting more emphasis upon students coming together with their interactions and collaborations for the purpose of learning. Picciano (2002) described this learning community as students’ presence in the social unit (such as the online classrooms) for the purpose of collaboration and
learning. Adding to the above definitions, Cassidy et al., (2008), described the learning community in higher education as a community of necessity that involves individuals who have a common purpose of learning.

These learning communities are always seen as created by the group with the help from the environment. The design of the learning environment and the effective integration of interaction activities play a major role in setting up the conditions for the learning communities to evolve (Garrison & Kanuka, 2004) where it will then be sustained through continuous interaction and collaboration among the participants. Lim (2004, p. 641) identified six major conditions that need attention from instructional designers and instructors towards the creation and sustaining of successful online learning communities and environments, “(1) seeking a balance between a system-generated guide and human facilitator, (2) visual representation of the inquiry process, (3) motivating learners with the right question, (4) engaging learners in various learning activities, (5) guiding the inquiry process with various scaffolds, and (6) maximizing learning by coordinating resources, tools and the community of inquiry.”

In the online learning environment, the formation of learning communities helps to sustain interaction and collaboration among students and instructors. To some extent instructors’ facilitation encourages community building; however, community building tends to result more from the collective work of the instructor, the students, and the environment rather than from some feature of the class created entirely by the instructor for the purposes of providing structure (Shea et al., 2012). With the broad acceptance of student collaboration using constructivist learning approaches, and the emergence of innovative instructional technologies, learner-learner interaction is improving and becoming the base structure for developing and sustaining the learning community (Ling, 2007).
Constructivist learning and Communities

The Community of Inquiry (CoI) framework based on collaborative constructivist learning principles suggests that learning occurs because of the interaction through social, teaching and cognitive presences by the community involved in the learning process (MacLean & Asher, 2009; Shea et al., 2012). Interaction and collaboration are important for the communities to evolve in the online learning environment, and the CoI framework supports the intentional development of these learning communities through preset conditions to help students to collaborate and learn in that environment (Shea & Bidjerano, 2009). It is thus essential to know the constructivist teaching and learning strategies to gain a clear understanding of the relationship between the three presences and how that helps to create a quality learning environment.

There are two types constructivist approaches discussed in the learning theories: Cognitive constructivism and Social constructivism (K. C. Powell & Kalina, 2009). Cognitive constructivism, based in Piaget’s theory, supports students constructing their own knowledge through their interaction with the content and the learning environment (K. C. Powell & Kalina, 2009). On the other hand, according to Powell & Kalina, Vygotsky’s social constructivism supports students’ knowledge construction through their interaction with the content and their social interaction. These social interactions comprise students’ interaction with other students, teachers and the experiences they bring to their learning environment.

Constructivist learning approaches support the active construction of knowledge by students through collaboration with their peers and instructors (Garrison, 2011). Interaction is the major component in constructivist-based learning approaches, because that is what helps
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students to collaborate with their peers, instructor and content to learn and construct knowledge (MacLean & Asher, 2009). The CoI framework based on the collaborative constructivist approach also aligns with the concept that students construct their knowledge through their interactions with their peers, the teacher and the content (Arbaugh, 2008).

Constructivist approaches rely on inquiry based learning where by students construct knowledge through their interactions with other learners and the learning environment (Gregory, 2002; K. C. Powell & Kalina, 2009; Sthapornnanon, Sakulbumrungsil, Theeraroungchaisri, & Watcharadamrongkun, 2009; Woo & Reeves, 2007). As opposed to the objectivist learning methods of one way learning transfer from instructor to students, constructivist learning strategies encourage knowledge construction by the learners through collaboration with the participants and environment (Akyol, Ice, Garrison, & Mitchell, 2010). In these student centered learning environments, learners take the lead in their learning, with the guidance from their instructors (Anderson, 2008). For such reasons, it is suggested that constructivist learning strategies can be used to teach high level thinking in the online learning environment (Anderson, 2008). Social constructivist learning proponents believe that students’ interactions and collaborations with their peers will help them to understand the concepts and ideas that they cannot understand on their own (Woo & Reeves, 2007).

With the emergence of new instructional technologies, creating environments to support constructivist learning practices through interaction and collaboration among students has become a reality (Wilson, 2004). Because of these developments, teaching practices that are compatible with the constructivist principles are gaining prominence in higher education to guide and design online learning environments (Bangert, 2009). Researchers believe that effective course designs based on constructivist learning approaches will create, support and sustain
learning communities where students can learn through collaboration with their instructor, peers and the learning environment (K. C. Powell & Kalina, 2009).

In a student centered learning environment, a social constructivist approach allows students to construct their knowledge through their interaction and collaboration with other learners. Instructors in these environments act as facilitators or experts in the field of study who can guide students in their process of knowledge building by provoking, scaffolding and evaluating their learning (Gregory, 2002). They also play an essential role by connecting the student community that they are facilitating with the instructor’s disciplinary community, thereby helping the learners to gain knowledge from the vast disciplinary communities that the student would otherwise not have access to as a learning resource (Gregory, 2002).

**Interaction and Presence in Online Learning**

Interaction plays a major role in the online learning environment as the foundation for the learning experience and also for helping us understand more about how people learn in the online environment (Garrison & Cleveland-Innes, 2005). Especially in distance learning, different kinds of interactions help students learn at several different levels within the learning process (Anderson, 2008; Jung, Choi, Lim, & Leem, 2002). Research about the influence of such interactions suggests that they have the potential to affect students’ learning in positive ways; on the other hand, lack of interactions between students, instructor, and course content can be a major disadvantage for online learning (Shu-Hui Hsieh & Smith, 2008).

In terms of initial perceptions about distance learning, Moore argued that for long time distance education was seen as "involving a teacher (T) interacting asynchronously (A) with a single student (S)" separated by a distance (M. G. Moore & Anderson, 2003). To provide a
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Perspective on the actual interactions in the online learning environment, he identified three types of interactions connecting students with their peers, teacher and content. Based on those categories Anderson and Garrison (1998) proposed a model (Fig. 1) to extend the basic three types of interactions to online interactions between the three main components (i.e. student, teacher and content) (Anderson, 2003). Their recommendations suggested the need to include additional interactions within each individual component such as student-student, teacher-teacher and content-content (Ling, 2007).

![Fig (1): Modes of interaction in distance education, Anderson and Garrison, (1998)](image)

However, in the online learning environment, to sustain these interconnected interactions, these relationships should extend beyond the limits and parameters of these individual modes of interactions. To explain this complex phenomenon, Garrison and Anderson (2000) proposed that these modes of interactions need also to create a sense of presence in the learning environment.
They developed the *Community of Inquiry (CoI)* framework to study and understand these interactions and collaborations through the social, teaching and cognitive presences in the online learning environment.

**Community of Inquiry (CoI)**

In order to study the complex relationships between the interaction elements in the online learning environment, we need a framework that defines and combines all aspects of the interactions to describe the totality of the learning experience in this environment. Community of Inquiry (CoI) theoretical framework provides a comprehensive structure allowing us to study and understand these complex and interconnected elements (Arbaugh et al., 2010; Lowenthal & Dunlap, 2010). According to Garrison, “CoI theoretical framework represents a process of creating a deep and meaningful (collaborative constructivist) learning experience through the development of three interdependent elements – social presence, cognitive presence and teaching presence” (Garrison, 2011, p. 22). The CoI framework is grounded in theoretical concepts of teaching and learning, and combines the philosophical insights from John Dewey’s work on community of inquiry (D. Randy Garrison et al., 2010). Because of its relevance to current online learning, it is considered as a useful framework to understand interactions in that environment.

A coherent theoretical framework is also crucial to guide and support the investigations into the research and practice of the fast-growing online teaching and learning environment (D. R. Garrison et al., 2010). A number of studies over the decade have used and validated the CoI framework and its research approaches to study student interactions in the online (Akyol, Garrison, & Ozden, 2009; Arbaugh et al., 2008; Shea & Bidjerano, 2009). In addition to these
more applied studies, the structure of the CoI theoretical framework has also been confirmed by many studies over the years (Garrison & Arbaugh, 2007).

Online curriculum designers and instructors can benefit from a model for creating quality online learning experiences for a wide range of disciplines and students. It is important to provide them with a model that uses a sound theoretical framework to integrate technology and pedagogy to create such quality online learning environments (Shea & Bidjerano, 2009), and CoI is regarded as a useful tool for exactly such purposes (Arbaugh & Hwang, 2006). Because it is one of the more popular and established frameworks currently used to study and describe interactions and learning in online and blended learning environments (Gorsky, Caspi, Blau, Vine, & Billet, 2012), this study will use the communities of inquiry (CoI) framework to explore undergraduate students’ perceptions of interactions through their social, teaching and cognitive presences in the online learning environment.

Social Presence, Teaching Presence, and Cognitive Presence within the CoI Model

Garrison and Anderson categorized the community of inquiry (CoI) interactions as social presence, teaching presence and cognitive presence.
The CoI framework describes the whole learning process and behaviors for knowledge construction through these various presences in the online learning environment (Shea & Bidjerano, 2009). The interactions through these presences in the framework are described as “crucial prerequisites for successful higher education experience” (Garrison et al., 2000, p. 87). Each of these presences include different but related sub-elements (categories) of interaction within the presence, and these categories identify and represent the different kind if interactions happening within that presence. A deeper look at the framework and presences would provide more details to understand the influence of these interactions in student learning in the online learning environment. This study uses the following (fig. 3) interpretations of the CoI framework to explore student interactions with their peers, instructor and content in relation to their learning.

Fig (2): CoI framework with its elements of educational experience.
Social Presence

Social presence is described as the “ability of participants to identify with a group, communicate purposefully in trusting environment, and develop personal and affective relationships progressively by way of projecting their individual personalities” (Garrison, 2011, p. 34).

Social presence consists of the categories (1) interpersonal communication, (2) open communication, and (3) cohesive communicative responses.

These three categories are described in the framework (Garrison, 2011) as follows:

- **Interpersonal communication**: Interpersonal communication is responsible for setting the academic climate for open and academically purposeful communication. It creates a climate and sense of belonging to the group (p. 37).

- **Open communication**: Open communication is built through a process of recognizing, complimenting, and responding to the questions and contributions of others, thereby encouraging reflective participation and interaction (p. 39).
• **Cohesive communicative Response:** It is the cohesion that sustains the commitment and purpose of a community of inquiry, particularly in an e-learning group separated by time and space (p. 39)

The roles of each of the three presences in the CoI framework have been studied and explained in the online learning environment. Among the three presences, social presence gained more interest from the online learning researchers over the last decade (Lomicka & Lord, 2007; Lowenthal & Dunlap, 2010; Mayne & Qiang, 2011; Richardson & Swan, 2003). Social presence represents students’ interaction with their peers for the purpose of collaboration and learning; it also helps online students to project themselves as “real people” meeting in the virtual environment (Shea & Bidjerano, 2009). In the current online learning environment, social presence and learner-learner interaction and collaboration are getting more attention because of the importance of creating-communities among geographically separated learners (Ling, 2007). Even though cognitive presence is seen as connected to the learning and satisfaction aspects of the CoI framework, social presences is seen as the foundation for student interaction and collaboration for the purpose of learning (Garrison & Cleveland-Innes, 2005).

Research studies show that learning activities and strategies designed to create and encourage more interaction and collaboration have shown an increase in student perceptions of social presence in the online learning environment (Mayne & Qiang, 2011). Social presence helps students to interact and collaborate with their peers to learn and construct knowledge. Evidence from previous studies suggests that students preferred more student-student interactions in their online courses (Knowles & Kerkman, 2007), and levels of increased social presence, as well, seem to predict an increase in perceptions of learning in the online environment (Richardson & Swan, 2003).
Even though some students prefer more social interactions, it is not clear that more social interaction necessarily encourages more learning beyond the level of student perception and student satisfaction. Social presence and interaction in online learning should thus focus on creating more collaborative activities like discussions and other learning activities where students can work with and benefit from their peers (Picciano, 2002). Finding the correct strategies to implement interactions is the key in creating a learning environment that enhances student learning and satisfaction. Course developers should consider user perceptions while creating collaborative learning environments, because user perceptions along with the learning environment seems to influence the degree of social and other presences in online learning environment (Chih-Hsiung, 2005).

**Teaching Presence**

Teaching presence is defined as “the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (Garrison, Anderson, & Archer, 2001)

Teaching presence consists of the categories: (1) design and organization, (2) facilitation discourse and (3) direct instruction.

These three categories are described in the framework (Garrison, 2011) as follows:

- **Design and organization**: These responsibilities provide the structure for any learning experience. Both design and organization have similar responsibilities and functions. However, the semantic difference is that design refers to structural decisions made before the process begins, while organization refers to similar decisions that are made to adjust to changes during the educational transaction (p.57)
Facilitation discourse: recognizes the role of the community of inquiry as enabling and encouraging the construction of personal meaning as well as shaping and confirming mutual understanding (p.58)

Direct instruction: goes beyond that of a facilitation role and is most often associated with specific content issues, such as diagnosing misconceptions. These are direct and proactive interventions that support an effective and efficient learning experience (p.59)

Studies that have focused on teaching presence in online learning show that students are more satisfied when they get to interact more with their instructors (Bray, Aoki, & Dlugosh, 2008). It is reported that course design and interactive activities have a significant effect on students cognitive presence and learning (D. R. Garrison et al., 2010). Students value highly the feedback and interaction they have with their instructors, regardless of the learning environment. More and more studies are now looking at the role of teaching presence in creating and facilitating a community of inquiry in online learning (Arbaugh, 2010; Arbaugh & Hwang, 2006; Dringus, Snyder, & Terrell, 2010), since this presence helps learners to focus on their learning. In student centered collaborative learning environments, the instructor’s role is seen as that of an orchestrator and facilitator of knowledge creation; the instructor’s absence in the learning environment negatively affects students presence and learning (Shea, Hayes, et al., 2010). Especially in the online learning environment, instructors provide the context and discipline to the learning process by helping students to stay in touch with the content, their peers and the learning environment. It is important for them to set up the structure and learning expectations to move their students beyond the basic level to “high order knowledge co-construction” through their course design and learning activities (Zydney, deNoyelles, & Kyeong-Ju Seo, 2012).
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Teaching presence thus has the power to establish and sustain learning communities in the online learning environment (Garrison, 2011). Arbaugh (2008) listed some of the activities that instructors of online courses could do through their teaching presences including “recreating Power Point presentations and lecture notes onto the course site, developing audio/video mini-lectures, providing personal insights into the course material, creating a desirable mix of and a schedule for individual and group activities, and providing guidelines on how to use the medium effectively”. Other studies suggest that teaching presence and the activities that go with it have a positive effect on students’ cognitive presence and learning in the online courses (Akyol et al., 2010; Shea & Bidjerano, 2009).

In the online learning environment, students will feel the teaching presence through the course materials provided by the instructors, the feedback they receive from their instructors, and their communication through emails and announcements (Wolf, Gilmer, & Caverly, 2011). Research suggests that the quality and quantity of these interactions, as created and maintained by the instructor, are important for student learning in the online environment because the instructor’s teaching presence and facilitation there provides a necessary binding factor helping the online communities to function more closely as an integrated group (Arbaugh & Hwang, 2006).

To create such a supportive community of inquiry, one that is core to the CoI framework, Garrison and colleagues (2011) proposed seven principles:

1. Plan for the creation of open communication and trust
2. Plan for critical reflection and discourse
3. Establish community and cohesion
4. Establish inquiry dynamics (purposeful inquiry)
5. Sustain respect and responsibility
6. Sustain inquiry that moves to resolution
7. Ensure that assessment is congruent with intended processes and outcomes (p. 16)

They also added that these principles, organized around the teaching presence are related to other interactions and reflect the issues of social and cognitive presence in the learning environment.

Teaching presence in the CoI framework is described as the strategies and methods that are essential to create and sustain learning communities through collaboration to enhance students’ learning (Bangert, 2009). Instructors could initiate this collaboration by constructing good discussion threads in online courses. Their teaching presence helps to setup the discussion forums to help students to collaborate and co-construct knowledge with their peers (Arbaugh, 2008; Barber, 2011; Zydney et al., 2012).

**Cognitive Presence**

Cognitive presence is described as “the extent to which the learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry” (Garrison et al., 2001, p. 11). In quality online courses, the focus and success of student learning can be reflected through the cognitive presence in the learning environment (Zydney et al., 2012). Cognitive presence based on the practical inquiry model consists of four phases known as (1) triggering event, (2) exploration, (4) integration and (4) resolution.

These phases are described in the framework (Garrison, 2011) as follows:

- The first phase, **triggering event**, is associated with conceptualizing a problem or issue (p.51)
The second phase, exploration, is a search for relevant information and ideas (p.52).

The third phase, integration, is the process of constructing a meaningful solution or explanation (p.52).

The fourth and final phase, resolution, critically assesses the viability of the proposed solution through direct or vicarious application (p.52).

Cognitive presence and learning depends on students’ interaction with their peers and on the instructor’s influence in the learning environment. Online students also seem to perceive timely response from their peers and instructors as an important factor for their learning (Plotnick, 2004). Students in another study reported that to achieve higher level of learning in the online course, they preferred more interactions with their peers or instructor (Shu-Hui Hsieh & Smith, 2008). The first two phases of the cognitive presence need social interaction (presence) for community building and collaboration, while the next two phases need social and teaching presences to move students through higher level learning process (Garrison et al., 2001).

So both social and teaching presences are essential to create a cognitive presence and help students learn in the online environment. These assertions are further supported by prior research that examined the relationships between the three presences in the online learning environment. Through one of those studies, Shea and Bidjerano (2009) reported that both social and teaching presence are correlated with the cognitive presence. Because of the association of learning phases with cognitive presence, it may be the main indicator for student learning and satisfaction in the online learning environment. A clear understanding of students’ perceptions of cognitive presence and the role of other presences in creating an environment for effective
cognitive presence would thus help us advance our knowledge about student learning in the online environment.

The following table (Fig 4) provides a summary of the presences in the CoI framework and related categories with some sample indicators.

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>CATEGORIES</th>
<th>INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Presence</td>
<td>Open Communication</td>
<td>Risk-free expression</td>
</tr>
<tr>
<td></td>
<td>Group Cohesion</td>
<td>Encourage collaboration</td>
</tr>
<tr>
<td></td>
<td>Affective Expression</td>
<td>Emoticons</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>Triggering Event</td>
<td>Sense of puzzlement</td>
</tr>
<tr>
<td></td>
<td>Exploration</td>
<td>Information exchange</td>
</tr>
<tr>
<td></td>
<td>Integration</td>
<td>Connecting ideas</td>
</tr>
<tr>
<td></td>
<td>Resolution</td>
<td>Apply new ideas</td>
</tr>
<tr>
<td>Teaching Presence</td>
<td>Design &amp; Organization</td>
<td>Setting curriculum &amp; methods</td>
</tr>
<tr>
<td></td>
<td>Facilitating Discourse</td>
<td>Sharing personal meaning</td>
</tr>
<tr>
<td></td>
<td>Direct Instruction</td>
<td>Focusing discussion</td>
</tr>
</tbody>
</table>

*Fig (4): Presences, categories and indicators*

Students’ perceptions are important indicators of their learning and satisfaction. Their perceptions of interactions through social, teaching and cognitive presences in relation to their learning and satisfaction are worth studying in the undergraduate online courses.

**The importance of CoI framework in online learning:**

The online learning environment is dynamic and active in that the interactions and presences drive the way students participate and learn in that environment. The CoI framework helps us to understand these interactions by providing “order and guidance into the complexities and dynamics of online and blended learning environments” (Akyol & Garrison, 2011). The popularity of the CoI framework in helping us to understand and explain the online learning
environment is evident from the citations it has received in scholarly publications and the
dissertations and masters studies that used the framework (Arbaugh et al., 2008; D. Randy
Garrison et al., 2010; Rourke & Kanuka, 2009). Recent online data shows that Garrison and
colleagues’ initial article has been cited 1314 times, with the first edition of his e-learning book
cited 1268 times (as of 5/23/2012, Google Scholar).

Most of the studies that used CoI framework over the decade have looked at and focused
on individual presences in the online learning environment. However, the CoI representation
implies that all three presences are important for the communities to evolve and for learning to
happen in the online learning environment (Shea & Bidjerano, 2009). In other words, research
suggests that the social, teaching and cognitive presences complement each other in essential
ways for the purpose of learning (Arbaugh, 2008). At the same time, however, a number of
these initial studies focused on graduate level courses from a limited number of disciplines.
With a significant number of higher education disciplines providing online learning options at all
levels, further study is needed in order to expand our knowledge throughout other areas of the
curriculum. We need to broaden our understanding throughout “a range perspectives and
disciplines” in order to understand more about perceptions of interaction, learning and
satisfaction across a much broader view of online learning (Arbaugh et al., 2010; Cassidy et al.,
2008).

According to Garrison, et al., (2010), the CoI framework is especially useful in
understanding the current technology enhanced online learning environment, because of the
inclusion of asynchronous communication, interaction and collaboration happening in this
environment. The CoI framework is structured around students’ interactions and collaboration in
online learning, rather than focusing on the traditional distance learning environment and
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theoretical perspective, where students worked separately (D. Randy Garrison et al., 2010). Using the Community of Inquiry (CoI) framework to look at all three presences in relation to student learning and satisfaction will thus provide us insights into learning preferences and student experiences in the learning environment.

Students’ perceptions of interactions and community in online learning

Students’ perceptions and their sense of being part of a learning community seem to be good indicators of their attachment to the community and their learning in the online environment. This sense of community is key to sustaining the educational experience and moving students beyond a basic understanding to more high-level thinking and knowledge building in online courses (Garrison & Kanuka, 2004; Zydney et al., 2012). Providing opportunities for students to interact and collaborate with other students will help them construct knowledge with their peers. Online developers must thus pay attention to creating conditions that support students’ interaction with their peers, instructor and content to create such quality online learning environments (Swan, 2002).

O’Reilly & Newton (2002) also suggest that interactions help students to overcome their sense of isolation within the learning environment to feel connected to the community. Researchers also point out that, in the online learning environment, “interaction was seen to remove feelings of being alone, motivate students, provide moral support, encourage exchange of ideas, provide an opportunity to learn from each other, and act as a benchmark for students to determine whether they were on a par with their peers” (Mash et al., 2006, p. 3). Under the right conditions, then, students will initiate social interactions themselves, because they see that as supporting their learning in the online learning environment (O’Reilly & Newton, 2002). Current
innovative instructional technologies provide tools and methods to create such conditions for collaboration through learning (Garrison & Kanuka, 2004).

The importance of interaction in the online learning environment has been investigated through many research studies in the past (DeTure, 2004), clearly establishing that much of the success of online courses depends on the nature of interactions among students and instructors in the learning environment (Picciano, 2002). Furthermore, and because of the increasing interest among younger college age learners in online courses, it is important to gather new data regarding student characteristics and perceptions to help in designing better-quality online learning environments (Orellana, 2006). Heightened awareness about student perceptions of online interactions will help online learning practitioners and researchers to make more fully informed pedagogical decisions while designing courses to address student expectations (Osborne et al., 2009).

Recent studies have also reported a shift in students perceptions and acceptance of the levels of interactions in the online learning (Mortagy & Boghikian-Whitby, 2010). These researchers believe that this shift in students’ perceptions could be because of the changes in the society, and young adults’ experiences with the social networking outside of their educational experience. They recommended more studies to investigate the perceptions of students who continue and complete their online courses to gain more understanding of their expectations in their online learning environments. Course developers should consider and include students’ expectations and perceptions of interactions to enhance their learning environment (Strom, Strom, & Beckert, 2011).

It is also important for researchers to look at the effects of age, gender and other demographic variables on students’ perceptions of interactions in the online learning
environment (Mortagy & Boghikian-Whitby, 2010). Because of the increased interest from traditional students for online courses, these researchers also highlighted the need to see differences in perceptions between adult and traditional-age students in the online learning environment. Knowing students’ perceptions of interactions, and establishing data driven practical guidelines based on those perceptions in relation to their learning and satisfaction will help designers and instructors to make informed decisions to create quality online learning environments to enhance students learning in online courses (Shea & Bidjerano, 2009).

It is particularly important to create interactive learning experiences to connect online students with their peers through their engagement in the learning environment (Zydney et al., 2012). Even though some research suggests that students disliked it when there was less interaction than they expected in their courses, other studies suggest that some instructors reduce the interaction within their online courses from the belief that students don’t actually desire such interaction (Thomson, 2010). In the current setting, instructors and course designers make the decisions about interaction and collaboration based on their perceptions of the online learning environment (Garrison, 2011). A better understanding of students’ perceptions and expectations is essential to create better learning environments that will enhance student learning. Establishing a learning community through interaction between the students, instructor and content is thus recommended as an essential component for a successful online learning environment (Swan, 2002).

**CoI framework to study students’ perceptions of interactions**

Presence in online learning is a social phenomenon, that evolves from the interactions between the students, instructor and content (Picciano, 2002). Students’ perceptions of these presences, in relation to their learning and satisfaction, are worth studying to provide practical
recommendations for the online course designers and developers. To this end, we should first understand the nature of interactions through a social constructivist learning framework (Woo & Reeves, 2007), since a clear understanding of the effects of these interactions will help us identify the necessary design principles and guidelines to build and implement more and better quality interactions. The Community of inquiry (CoI) model based on the collaborative constructivist principles provides a framework for studying and understanding interactions and learning in the online environment (D. R. Garrison et al., 2010). These online learning interactions evolve through students’ presence in the learning environment to help them further collaborate and build knowledge. In these environments learning occurs through the interaction between social, teaching and cognitive presences (Zydney et al., 2012).

Garrison, et al. (2000) also argued that to “create the deepest levels of reflective thought and learning” all three elements of the framework should be integrated together and studied as a whole to understand the interconnections and how those interactions create, support and sustain the community of inquiry in online learning. Studies by Garrison and colleagues over the past decade show that the teaching presence plays a major role in creating and sustaining other presences in the online learning environment. They have also recommended future studies to explore students’ perceptions of teaching, cognitive and social presences across disciplines.

We are already seeing a growing number of studies looking at all three presences to understand students’ perceptions of teaching and learning (Akyol, Vaughan, & Garrison, 2011; Arbaugh et al., 2010; Archibald, 2010; D. R. Garrison et al., 2010; Kumar et al., 2011; Shea & Bidjerano, 2009). There are some studies now looking at students’ perceptions of their presences in the online environment and the relationships between those presences. In his study Archibald (2010) looked at the predictability of teaching and social presence in student cognitive presence
in 10 research methods courses with 189 students. His primary results showed that teaching and social presence had significant contributions to the prediction of cognitive presence. He reported that, quantitatively, teaching and social presence explained 69% of the variance in cognitive presence. However, generalizability of these results to other disciplines and undergraduate courses may require further research on undergraduate students’ perceptions from other disciplines.

The importance of asynchronous discussion in online learning environments is well documented, studied and reported in online learning (Zydney et al., 2012). Such research also highlights the role of teaching presence in setting up the conditions for student collaboration (social presence) and learning (cognitive presence) in the online learning environment. In one study of creating a community of inquiry in online learning, Zydney, et al., (2012) looked at the use of protocols to communicate faculty expectations, and its influence on asynchronous online learning discussion forums. Their study involved two graduate online courses, one using a protocol and the other not using a protocol. They found that the use of a protocol promoted more group cognition and helped distribute social, teaching and cognitive presences more evenly to create and sustain online learning inquiry.

Currently, more and more institutions are using the Quality Matter (QM) framework and best practices to create their online courses. In their study, Swan, et al., (2012) looked at the courses redesigned with QM best practices and studied the student learning experiences using the Community of Inquiry framework. The courses under study in this research followed the Quality Matters design guidelines to encourage interaction and collaboration among participants in these courses, and initial results showed positive learning experiences in the redesigned courses.
Furthermore, studies have found that students with prior online learning experiences tended to have positive perceptions about the online learning environments (Dobbs, Waid, & del Carmen, 2009; Mortagy & Boghikian-Whitby, 2010; Xiaojing, Shijuan, Seung-hee, & Magjuka, 2010). It is important to better understand the differences in perceptions of online students based on the learning experiences. This study also collected data after the semester is over to include the possibility of giving learners enough time to “complete the higher-order phases of the critical inquiry process” (Arbaugh, 2008).

Research studies on online course interaction have relied heavily on qualitative data and content analysis of the text-based interactions in the online environment. New research approaches are needed to look at the comprehensive relationships among the CoI presences to help us better understand these complex interactions. CoI researchers have suggested that it’s time to move beyond the current approaches of focusing on the individual components or presences of the theoretical framework to more quantitative studies looking at the dynamic and comprehensive relationship among the three presences (D. R. Garrison et al., 2010).

Students’ perceptions could give us the understanding about their expectations of quality of interactions in the online learning environment. With the development of the CoI survey instrument, quantitatively studying the effects of presences in online learning has become much more feasible. Through a number of studies, researchers have confirmed factor structure of the CoI survey and the hypothesized causal relationships among the presences predicted by the CoI framework (D. R. Garrison et al., 2010). This study uses the Community of Inquiry (CoI) theoretical framework to study students’ perceptions of social, teaching and cognitive presences in the online learning environment in relation to their learning and satisfaction.
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There is a belief among some instructors and course developers that interaction enhances online learning and that students prefer more interactions (Vamosi, Pierce, & Slotkin, 2004). However, there is a need for more studies to understand student perceptions and expectations of each of these interactions so that we better understand how to create the conditions that enhance student learning in the online environment (Driver, 2002; Shu-Hui Hsieh & Smith, 2008). This study will use the Community of Inquiry (CoI) theoretical framework to study students’ perceptions of interactions through their presences in the online learning environment in relation to their learning and satisfaction. It will also look at the effects of some of the demographic and course variables (age, gender, online experience, course duration, course enrollment, class standing) on students’ perceptions of their online presences, learning and satisfaction. These kinds of studies and practical knowledge regarding the demographic changes in the online learning would be useful for the course designers and practitioners to create online learning environments to enhance their learning (Akyol & Garrison, 2011). The study results will benefit other similar disciplines as they seek to design and deliver quality online learning experiences for deeper and more meaningful learning.

Summary

To create quality online learning environments, we need to first look at the students’ perceptions and their expectations of interactions in the learning environment. It is also essential to study and understand each of the learning presences and their role in creating and sustaining interactions for collaboration and knowledge construction in that environment. The Community of Inquiry theoretical framework provides a comprehensive structure to study these interaction elements in online courses in relation to student learning and satisfaction. This review of literature has summarized the concepts of interactions and the role of students’ perceptions of
social (with peers), teaching (with instructor) and cognitive (with content) interactions in the online learning environment.
CHAPTER 3

METHODOLOGY

The purpose of this study was to investigate undergraduate online students’ perceptions of presences in the online learning environment. This study used a non-experimental survey research design to explore online students’ perceptions of their social, teaching and cognitive presences in their online environment. It also examined the differences in students’ perceptions of these presences based on age, gender, class standing, online learning experience, course enrollment and course duration. Study questions were developed based on the CoI framework to explore undergraduate students’ perceptions of presences in online learning. This study looked at the following two major questions:

1. What are the perceptions of undergraduate students regarding teaching, social and cognitive presences in online courses?

2. What are the differences in undergraduate students’ perceptions of teaching, social and cognitive presences in online courses based on their age, gender, class standing, online experience, course enrollment, and course duration?

The setting:

Since the purpose of the study was to investigate undergraduate online students’ perceptions of interaction in online courses, this research study included all undergraduate courses taught completely online during the fall 2012 semester from the College of Public Health, Kent State University. The estimated online enrollment was approximately 600 students. These courses were delivered using the Blackboard Learn Course Management System hosted by Kent State University.
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All of these courses had the same structure, interaction tools and methods (Fig. 5). Course coordinators planned and created these courses with design and development assistance from the Instructional Designer (Principal Investigator). These courses used some of the collaborative and communication features in the Blackboard course management system, including discussion forums, wikis, email, announcements, etc.

Characteristics of the courses surveyed in this study

The courses surveyed in this study were designed and delivered based on the Quality Matters (QM) 2011-2013 standards. These courses incorporated all essential criteria and alignments to design a collaborative learning environment to encourage interaction and learning. The typical approach to designing and developing the courses included instructors working with the instructional designer throughout the process.
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Course design started with instructors creating learning objectives for the course and aligning those with module learning objectives. Each learning module informed students about the learning objectives and how that module aligns with the activities and overall learning objectives for the course. The learning activities were designed to encourage more interactions among students, instructors and course materials. Instructors communicated with students through online office hours, emails and announcements. They also interacted with students with timely feedback and comments for students’ weekly assignments.

Course instructors created introduction videos for the class. These videos also oriented students to the course structure and learning assignments. Students had the opportunity to get introduced to other students through an “Introduce Yourself” forum. An instructor monitored “Open Questions Forum” helped the students to get help from other students and instructors about the course material and assignments.

Each topical module included instructor-moderated discussion forums. Students were provided with discussion posting criteria (rubrics) to encourage them to follow academic standards in their posting. Students were also required to post more replies to other students. These kinds of asynchronous discussion forums seem to enhance student participation and interaction in online learning courses (Nagel & Kotzé, 2010). Set timelines helped students to stay on task so that other students could read and respond to their postings. Instructors provided relevant feedback and comments immediately after the deadlines to help students with their learning.

Instructors also provided more feedback for assignments and other activities, including written papers, article reviews, op-eds, case study reports and writing assignments. Module
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summaries using announcements, emails and wikis were used to help students to review weekly learning materials. Instructors monitored students’ progress through their grades and course reports. They also used early intervention tools to provide more help and guidance to students who needed that assistance. Depending on the topic and level of instruction, instructors also provided other activities and assessments in the class. The interaction components such as discussion, email, announcements and other feedback mechanisms stayed the same in all of these courses.

**Instrumentation:**

This study used a version of the CoI instrument developed by Arbaugh et al., (2008). The survey instrument was adapted from a study that used additional questions on overall learning and satisfaction along with the main CoI instrument items (Akyol & Garrison, 2008). College of Public Health online students who have taken at least one online course during the fall of 2012 semester were invited to take part in this study. The online survey included 34 CoI items, along with overall learning, satisfaction and other demographic questions. Participant responses for each of the presences were used to explore students’ perceptions of social, teaching and cognitive presences in the online learning environment. An in-depth analysis of the individual categories that make up each of the presences in the CoI framework was used to gain more insights into students’ perceptions of these presences.

The CoI survey instrument consists of 34 items derived from three main elements of the framework namely, teaching presence, social presence and cognitive presence. From this total of 34, 9 items relate to social presence, 13 items relate to teaching presence, 12 items relate to cognitive presence. The instrument uses a 5 point Likert scale (1 -5) that goes from “strongly
disagree” to “strongly agree.” The 42-item survey for this study includes these 34 items, 2 items for overall learning and satisfaction, and 6 demographic items. The demographic questions were used to gain insights into the differences in students’ perceptions based on age, gender, class standing, online experience, course enrollment, course duration.

Table 1

*Categorization of survey items by sections*

<table>
<thead>
<tr>
<th>Category</th>
<th>Survey Item number</th>
<th>Total number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1 (CoI survey items)</td>
<td>1 – 34</td>
<td>34</td>
</tr>
<tr>
<td>Section 2 (Overall Learning and Satisfaction)</td>
<td>35, 36</td>
<td>2</td>
</tr>
<tr>
<td>Section 3 (Demographic items)</td>
<td>37, 38, 39, 40, 41, 42</td>
<td>6</td>
</tr>
</tbody>
</table>

The online survey was delivered in three sections. Section I presented the Community of Inquiry survey items, Section II included two questions on overall learning and satisfaction, and section III asked the demographic questions.

**Section I:**

This section of the survey mainly focused on students’ perceptions of teaching, social and cognitive presences. Teaching presence questions were grouped into three categories, namely *Design & Organization, Facilitations and Direct Instruction*. Social presence questions were grouped into *Affective Expression, Open Communications and Group Cohesion*. Finally cognitive presence questions were grouped into *Triggering Event, Exploration, Integration and Resolution*. A 5 point Likert scale was used to record student responses.
Table 2

*Categorization of social, teaching and cognitive presence survey items by indicators*

<table>
<thead>
<tr>
<th>Presences/Elements</th>
<th>Categories/Indicators</th>
<th>Survey Item Number</th>
<th>Total number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Presence</td>
<td>Design and Organization</td>
<td>1 – 4</td>
<td>4</td>
</tr>
<tr>
<td>Teaching Presence</td>
<td>Facilitation</td>
<td>5 – 10</td>
<td>6</td>
</tr>
<tr>
<td>Teaching Presence</td>
<td>Direct Instruction</td>
<td>11 – 13</td>
<td>3</td>
</tr>
<tr>
<td>Social Presence</td>
<td>Affective Expression</td>
<td>14 – 16</td>
<td>3</td>
</tr>
<tr>
<td>Social Presence</td>
<td>Open Communication</td>
<td>17 – 19</td>
<td>3</td>
</tr>
<tr>
<td>Social Presence</td>
<td>Group Cohesion</td>
<td>20 – 22</td>
<td>3</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>Triggering Event</td>
<td>23 – 25</td>
<td>3</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>Exploration</td>
<td>26 – 28</td>
<td>3</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>Integration</td>
<td>29 – 31</td>
<td>3</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>Resolution</td>
<td>32 – 34</td>
<td>3</td>
</tr>
</tbody>
</table>

**Section II:**

This section of the survey was focused on students’ perceptions of overall learning and satisfaction in the online courses. This section also used a 5 point Likert scale to record student responses.

**Section III:**

The final section of the survey was used to study the differences in students’ perceptions of presences based on their age, gender, class standing, online learning experience, course
enrollment and course duration. Depending on the questions, the responses were recorded with appropriate scales.

The 34 item CoI instrument was seen as an appropriate tool to make interpretations about students perceptions of their presences and interactions in online learning (Bangert, 2009) and also as a useful tool for studying the interaction elements based on the CoI framework in online courses (Bangert, 2009; Kumar et al., 2011). Construct validity of the presences measured by CoI instrument has shown that the instrument can be used as a valid measure of the three presences (Arbaugh, et al., 2008). Recent studies have supported that argument with Cronbach’s alpha values of 0.94 for teaching presence, 0.91 for social presence and 0.95 for cognitive presence (Akyol & Garrison, 2011).

The purpose of this study was to explore the perceptions of online students as those perceptions provide practical recommendations for course designers and developers to improve and redesign their courses to enhance learning in the online environment. The CoI framework and survey have been used in a considerable number of studies, and acceptable evidence exists to support that goal (Bangert, 2009).

Data Collection:
This study uses a non-experimental survey research design to gain an understanding of students’ perceptions of online interaction through their presences in the online learning environment. Data were collected using an online survey that included the CoI survey plus questions about learning and satisfaction as well as some demographic questions. The online survey collected data from approximately 600 College of Public Health undergraduate students with an age requirement of 18 or older to take part in this study. The survey was created using the Qualtrics online survey system hosted and authenticated by Kent State University.
A data set was created with fall 2012 Public Health online students from the College’s online database. Students’ Kent State University emails from the dataset were used to invite them to participate in the study using the invitation email (see Appendix A) and the study information sheet (see Appendix B) approved by the Institutional Review Board (IRB) at the University of Cincinnati. The study site, Kent State University’s IRB, signed an agreement to follow the University of Cincinnati IRB’s approval for this study. The survey (Appendix C) was made available to students for three weeks.

The students received the survey as an embedded link in their invitation email. Participants were only allowed to take the survey one time using the link provided to them in their invitation email. Students were informed of their options to exit out of the survey if they were not willing to take part in this study.

Limitations of the Study:

Data used in this study was collected from all the undergraduate students from the College of Public Health who completed an online course in the fall 2012 semester. The response rate was dependent on the number of students who completed the online survey questionnaire voluntarily.

This study population included all the undergraduate online students from the College of Public Health from the fall 2012 semester. Interpretations provided from collected data were based on the setting and participants in this study.
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Data Analysis:

Data were analyzed using SPSS (Statistical Package for the Social Sciences) in order to answer the research questions. The students’ response data from the online survey was transferred to the SPSS package using the Qualtrics SPSS support format.

Descriptive statistics involving frequencies and percentages were used to analyze and explore students’ responses for each of the survey question items. Means, averages and standard deviation were used analyze the probable accuracy of students’ responses for each of the questionnaire items. These frequencies, means, averages and standard deviation were presented in a tabular format in chapter 4.

Research Question 1 was concerned with students’ perceptions of social, teaching and cognitive presences in the online learning environment. Frequencies and percentages were calculated for the social, teaching, cognitive, learning, satisfaction and demographic categories. Cronbach’s alpha for each category of the presences were calculated to report the internal consistency of those categories. Data were presented in tabular format for each category of the presences in chapter 4.

Research Question 2 was concerned with the differences characterizing students’ perceptions of social, teaching and cognitive presences based on age, gender, class standing, online learning experience, course duration, and course enrollment. To make more generalized recommendations, this study will use inferential statistics to add to current research findings on students’ perceptions of presences in the online learning environment (Lomicka & Lord, 2007). Depending on the population distribution, ANOVA or a non-parametric test will be used to
answer the demographic questions and report the difference in perceptions based on the sub groups.

A cross-tabulation method was used to report students’ perceptions of overall learning and satisfaction and how they are interrelated. Responses from items 35 and 36 in the survey dealt with overall learning and satisfaction. The student responses for these questions were used to generate the cross tabulated graph of the relationship.

**Summary:**

The purpose of this research study was to investigate undergraduate online students’ perceptions of presences in the online learning environment. The research approach used for this study was a non-experimental survey research design. Descriptive and inferential statistics were used to explore, analyze and report the study findings. The researcher believes that this study will provide much needed insights into the design of quality online learning environment for similar disciplines. This chapter discussed the research methodology, data collection and data analysis used in this study.
CHAPTER 4

RESULTS

The purpose of this research study was to investigate students’ perceptions of interactions in the online learning environment. This study used a non-experimental survey research design to explore undergraduate, online students’ perceptions of their social, teaching and cognitive presences in an online learning environment. Two major questions were used to study their perceptions of their presences in the online environment and how those perceptions might differ according to different demographic characteristics, including gender, age, class standing, online learning experience, course enrollment and enrolled course duration.

This chapter has been organized to present the statistical analysis of the data collected to answer the two major questions and the interrelationship between students’ overall learning and satisfaction students in the online courses. Results of the undergraduate students’ perceptions of the presences from section 1 of the survey questionnaire have been analyzed and are used here to answer the first question. The demographic characteristics from section 3 were then used to analyze the differences characterizing student perceptions of presences as revealed in their answer in section 1. Additional cross tabulated analysis was done using section 2 items overall learning and satisfaction so as to investigate the interrelationship between those two concepts. A side-by-side comparison of overall learning and satisfaction was then conducted and graphed in order to show how the student responses might have related those two concepts.

Since the purpose of the study was to investigate undergraduate online students’ perceptions of presences in online courses, this research study included all undergraduate courses taught completely online during the fall 2012 semester from the College of Public Health, Kent
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State University. Data were collected using an online survey that included the CoI survey plus questions about learning and satisfaction as well as some demographic questions. The online survey collected data from approximately 600 College of Public Health undergraduate students, with an age requirement of 18 or older to take part in this study. Out of the total of 600 undergraduate online students, 151 students started the survey and 121 respondents completed and submitted their surveys. Only completed (n=121) responses from the online survey were considered to analyze and report for this study.

Table 3 shows the statistical summary of the participants’ demographic characteristics, including gender, age, class standing, online learning experience, course enrollment, and enrolled course duration.

Table 3

Demographic characteristics of the undergraduate online student participants

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
<td>10.7</td>
</tr>
<tr>
<td>Female</td>
<td>106</td>
<td>87.6</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 -19</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>20 – 21</td>
<td>20</td>
<td>16.5</td>
</tr>
<tr>
<td>22 – 24</td>
<td>26</td>
<td>21.5</td>
</tr>
<tr>
<td>25 and above</td>
<td>72</td>
<td>59.5</td>
</tr>
<tr>
<td>Class Standing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>10</td>
<td>8.3</td>
</tr>
<tr>
<td>Sophomore</td>
<td>15</td>
<td>12.4</td>
</tr>
<tr>
<td>Junior</td>
<td>38</td>
<td>31.5</td>
</tr>
<tr>
<td>Senior</td>
<td>57</td>
<td>47.1</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Consistent with other studies, a high percentage of respondents who completed the survey were female undergraduate online students (D. R. Garrison et al., 2010). More than half of the students (52.9%) who responded have enrolled both in online and in-class courses in the fall 2012 semester. Another significant finding is that 67.8% of the students who responded for the survey have already taken at least 2 or more online courses before taking this course in the fall 2012 semester.

**Research Question 1:**

What are the perceptions of undergraduate students regarding teaching, social and cognitive presences in online courses?

For each of the categories under teaching, social and cognitive presences, descriptive statistics are reported here to show the reliability of students’ responses. In order to explore perceptions of undergraduate students regarding their teaching, social and cognitive presences in the online environment, frequencies and percentages for each of the CoI items were calculated.
Reliability scores (α) of 0.9 and above are reported here for this study’s survey items, similar to other recent studies using the CoI instrument (Akyol & Garrison, 2011). Table 4 provides the details about the CoI elements, categories and the survey items within those categories.

Table 4

CoI Elements, Categories and Survey Items within categories

<table>
<thead>
<tr>
<th>CoI Elements/Components</th>
<th>Categories/Indicators</th>
<th>Survey Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Presence</td>
<td>• Design and Organization</td>
<td>1 - 4</td>
</tr>
<tr>
<td></td>
<td>• Facilitation</td>
<td>5 - 10</td>
</tr>
<tr>
<td></td>
<td>• Direct Instruction</td>
<td>11 - 13</td>
</tr>
<tr>
<td>Social Presence</td>
<td>• Affective expression</td>
<td>14 - 16</td>
</tr>
<tr>
<td></td>
<td>• Open communication</td>
<td>17 - 19</td>
</tr>
<tr>
<td></td>
<td>• Group Cohesion</td>
<td>20 - 22</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>• Triggering Event</td>
<td>23 - 25</td>
</tr>
<tr>
<td></td>
<td>• Exploration</td>
<td>26 - 28</td>
</tr>
<tr>
<td></td>
<td>• Integration</td>
<td>29 - 31</td>
</tr>
<tr>
<td></td>
<td>• Resolution</td>
<td>32 - 34</td>
</tr>
</tbody>
</table>

Teaching Presence

To check the reliability of responses for items in each of the categories, Cronbach’s Alpha was calculated for each of the main components (design and organization, facilitation, direct instruction) of the teaching presence and overall teaching presence element. Table 5 provides the reliability information for the teaching presence. The categories design and
organization had a reliability $\alpha = 0.91$, facilitation had reliability $\alpha = 0.94$, direct instruction had reliability $\alpha = 0.879$ and the overall Teaching Presence element had a reliability $\alpha = 0.964$. The alpha value for each of the components and for overall teaching presence was well above the recommended 0.7 for exploratory research studies.

Table 5

*Reliability statistics for Teaching Presence (Cronbach’s Alpha)*

<table>
<thead>
<tr>
<th></th>
<th>Design and Organization</th>
<th>Facilitation</th>
<th>Direct Instruction</th>
<th>Overall Teaching Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>$\alpha = 0.91$</td>
<td>$\alpha = 0.94$</td>
<td>$\alpha = 0.879$</td>
<td>$\alpha = 0.964$</td>
</tr>
</tbody>
</table>

*Note: n=121*

Descriptive statistics of mean, median, standard deviation, Q1, Q2, and range were calculated and used to provide details about the distribution of the responses collected from students. These details are tabulated in Table 6.

Table 6

*Descriptive Statistics of Teaching Presence*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Q1</th>
<th>Q3</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and Organization (4 items)</td>
<td>16.82</td>
<td>17.00</td>
<td>3.17</td>
<td>16.00</td>
<td>20.00</td>
<td>4.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Facilitation (6 items)</td>
<td>21.64</td>
<td>22.00</td>
<td>6.01</td>
<td>17.50</td>
<td>26.00</td>
<td>6.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Direct Instruction (3 items)</td>
<td>11.12</td>
<td>12.00</td>
<td>3.06</td>
<td>9.00</td>
<td>13.00</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Teaching Presence (13 items)</td>
<td>49.59</td>
<td>51.00</td>
<td>11.49</td>
<td>43.00</td>
<td>58.00</td>
<td>13.00</td>
<td>65.00</td>
</tr>
</tbody>
</table>

*Note: n=121*
For each of items in the teaching presences element (1-13), frequencies and percentages were calculated. Combined percentages of strongly agree or agree were calculated and reported to show the levels of positive student perceptions for each of the presences.

Table 7 represents the frequencies for each of the survey items within the Teaching Presence element and a combined total percentage of strongly agree or agree for each of the items. Percentages of strongly agree or agree responses were used in determining the levels of positive perceptions about the students’ social, teaching and cognitive presences in online courses.

Table 7

Frequencies with the CoI Items and combined Strongly Agree (SA) and Agree (A)

<table>
<thead>
<tr>
<th>CoI survey Items (Teaching Presence)</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design and Organization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The instructor clearly communicated important course topics.</td>
<td>49</td>
<td>54</td>
<td>9</td>
<td>7</td>
<td>2</td>
<td>85.1</td>
</tr>
<tr>
<td>2. The instructor clearly communicated important course goals.</td>
<td>56</td>
<td>57</td>
<td>10</td>
<td>6</td>
<td>2</td>
<td>85.1</td>
</tr>
<tr>
<td>3. The instructor provided clear instructions on how to participate in course learning activities.</td>
<td>48</td>
<td>53</td>
<td>11</td>
<td>6</td>
<td>3</td>
<td>83.5</td>
</tr>
<tr>
<td>4. The instructor clearly communicated important due dates/time frames for learning activities.</td>
<td>63</td>
<td>47</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>90.9</td>
</tr>
<tr>
<td><strong>Facilitation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.</td>
<td>34</td>
<td>33</td>
<td>35</td>
<td>10</td>
<td>6</td>
<td>55.4</td>
</tr>
<tr>
<td>6. The instructor was helpful in guiding the class towards understanding course topics in a way</td>
<td>33</td>
<td>50</td>
<td>21</td>
<td>12</td>
<td>5</td>
<td>68.6</td>
</tr>
</tbody>
</table>
that helped me clarify my thinking.

7. The instructor helped to keep course participants engaged and participating in productive dialogue. 31 42 25 15 8 60.3

8. The instructor helped keep the course participants on task in a way that helped me to learn. 28 47 29 11 4 61.9

9. The instructor encouraged course participants to explore new concepts in this course. 35 37 27 16 4 60.5

10. Instructor actions reinforced the development of a sense of community among course participants. 26 36 28 24 6 51.3

<table>
<thead>
<tr>
<th>Direct Instruction</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.</td>
<td>29</td>
<td>55</td>
<td>19</td>
<td>13</td>
<td>4</td>
<td>69.5</td>
</tr>
<tr>
<td>12. The instructor provided feedback that helped me understand my strengths and weaknesses.</td>
<td>30</td>
<td>42</td>
<td>18</td>
<td>21</td>
<td>9</td>
<td>59.5</td>
</tr>
<tr>
<td>13. The instructor provided feedback in a timely fashion.</td>
<td>40</td>
<td>49</td>
<td>17</td>
<td>9</td>
<td>6</td>
<td>73.6</td>
</tr>
</tbody>
</table>

Note: n=121, SD = Strongly Disagree (1), D = Disagree (2), NA/ND (3) = Neither Agree nor Disagree, A = Agree (4), SA = Strongly Agree (5)

**Design and Organization**

For all four items (1 - 4) of the design an organization category, 83.5 to 90.9 percent of the students responded *strongly agree* or *agree*. A total of 90.9% of the students strongly agreed or agreed that *the instructor clearly communicated important due dates/time frames for learning activities*. Also, 83.5% of the students strongly agreed or agreed that *the instructor provided clear instructions on how to participate in course learning activities*. The strongly disagree, disagree or neither disagree nor agree responses are significantly lower than the strongly agree or agree responses for the items in this category. The data from this category suggests that the
undergraduate students liked the way the course was designed and organized and were happy with their instructors’ communication regarding course details and their expectations for these courses.

**Facilitation**

For all six items (6-10) of the facilitation category, 51.3 to 68.6 percent of the students reported *strongly agree or agree.* A total of 68.6% of the students strongly agreed or agreed that *the instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.* Also 51.3% of the students strongly agreed or agreed that *the instructor actions reinforced the development of a sense of community among course participants.* However, almost 20% of the students also reported that they neither agree or nor disagree for the items in the facilitation section. Facilitation being one of the major components of the teaching process, additional analysis of data based on the demographic characteristics could provide us further understanding of the student groups that responded negatively or neutrally to all the statements in this category. Research Question 2 deals with these differences in detail based on the demographic characteristics.

**Direct Instruction**

For the last three items (11-13) of the teaching presence in the direct instruction category, 59.9 to 73.6 percent of the students reported strongly agree or agree. 59.9% of the students responded that *the instructor provided feedback that helped me understand my strengths and weaknesses.* Also, 73.6% of the students reported strongly agreeing or agreeing with the item *the instructor provided feedback in a timely fashion.* Despite a response suggesting that feedback is timely, almost 35% reported that the feedback did not in fact help them to understand
their strengths and weaknesses, suggesting that undergraduate students might still need even more guidance from instructors in online courses to help them understand their level of achievement in such courses.

Social Presence

To check the reliability of responses for items in each of the categories, Cronbach’s alpha were calculated for each of the categories (affective expression, open communication, group cohesion) of social presence and overall teaching presence element. Table 8 provides the reliability information for the social presence. Among the categories affective expression had a reliability $\alpha = 0.773$, open communication had reliability $\alpha = 0.899$, Group cohesion had reliability $\alpha = 0.746$, and the overall Social Presence element had a reliability $\alpha = 0.898$. The alpha value for each of the groups and overall social presence were well above the recommended 0.7 for exploratory research studies.

Table 8

Reliability statistics Social Presence (Cronbach’s Alpha $\alpha$)

<table>
<thead>
<tr>
<th></th>
<th>Affective Expression</th>
<th>Open Communication</th>
<th>Group Cohesion</th>
<th>Overall Social Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>$\alpha = 0.773$</td>
<td>$\alpha = 0.899$</td>
<td>$\alpha = 0.746$</td>
<td>$\alpha = 0.898$</td>
</tr>
</tbody>
</table>

Note: $n=121$

Descriptive statistics of mean, median, standard deviation, Q1, Q2 and range were used to provide details about the distribution of the responses collected from students. These details are tabulated in Table 9.
Table 9

Descriptive Statistics of Social Presence

<table>
<thead>
<tr>
<th>Categories</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Q1</th>
<th>Q3</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Expression (3 items)</td>
<td>9.76</td>
<td>10.00</td>
<td>2.75</td>
<td>8.00</td>
<td>12.00</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Open Communication (3 items)</td>
<td>12.22</td>
<td>12.00</td>
<td>2.40</td>
<td>12.00</td>
<td>14.50</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Group Cohesion (3 items)</td>
<td>11.31</td>
<td>12.00</td>
<td>2.28</td>
<td>10.00</td>
<td>12.00</td>
<td>5.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Social Presence (9 items)</td>
<td>33.30</td>
<td>33.00</td>
<td>6.43</td>
<td>30.00</td>
<td>37.50</td>
<td>16.00</td>
<td>45.00</td>
</tr>
</tbody>
</table>

Note: n=121

Table 10 represents the frequencies for each item in the categories included in the Social Presence and a combined total percentage of Strongly Agree and Agree for each of the items included in the category.

Table 10

Frequencies with the CoI Items and combined Strongly Agree (SA) and Agree (A)

CoI survey Items (Social Presence)

<table>
<thead>
<tr>
<th>Affective Expression</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Getting to know other course participants gave me a sense of belonging in the course.</td>
<td>13</td>
<td>34</td>
<td>44</td>
<td>22</td>
<td>7</td>
<td>38.8</td>
</tr>
<tr>
<td>15. I was able to form distinct impressions of some course participants.</td>
<td>13</td>
<td>48</td>
<td>31</td>
<td>20</td>
<td>8</td>
<td>50.4</td>
</tr>
<tr>
<td>16. Online or web-based communication is an excellent medium for social interaction.</td>
<td>18</td>
<td>36</td>
<td>39</td>
<td>21</td>
<td>7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Open communication</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. I felt comfortable conversing through the</td>
<td>33</td>
<td>64</td>
<td>14</td>
<td>6</td>
<td>2</td>
<td>80.2</td>
</tr>
</tbody>
</table>
18. I felt comfortable participating in the course discussions.  
19. I felt comfortable interacting with other course participants

<table>
<thead>
<tr>
<th>Group cohesion</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.</td>
<td>23</td>
<td>72</td>
<td>16</td>
<td>8</td>
<td>0</td>
<td>78.5</td>
</tr>
<tr>
<td>21. I felt that my point of view was acknowledged by other course participants.</td>
<td>27</td>
<td>68</td>
<td>14</td>
<td>9</td>
<td>3</td>
<td>78.5</td>
</tr>
<tr>
<td>22. Online discussions help me to develop a sense of collaboration.</td>
<td>20</td>
<td>56</td>
<td>24</td>
<td>17</td>
<td>2</td>
<td>62.8</td>
</tr>
</tbody>
</table>

Note: n=121, SD = Strongly Disagree (1), D = Disagree (2), NA/ND (3) = Neither Agree nor Disagree, A = Agree (4), SA = Strongly Agree (5)

**Affective Expression**

For the three items (14 -1) in the affective expression category, 38.8 – 50.4 percent of the students reported strongly agree or agree. A low 38.8% of the students strongly agreed or agreed for the item, *getting to know other course participants gave me a sense of belonging in the course*. Also 50.4% of the students strongly agreed or agreed with the item, *I was able to form distinct impressions of some course participants*. Almost 30 – 35% of the students neither agreed nor disagreed with any of the items in this category. Also, nearly 45 percent of the students had positive perceptions on the statement, *online or web-based communication is an excellent medium for social interaction*. However, one third of the students who responded in this study abstained from responding one way or the other to this particular question. This could also suggest that a group of students -- possibly based on their demographic characteristics --
might have perceived that simply knowing and communicating with other students has not substantially changed their learning in these online courses.

Open Communication

For the open communication items (17 -19), 80.2 – 89.2 percentage of the students responded agreeing or strongly agreeing with the items. 80.2% of the students agreed or strongly agreed for the item, *I felt comfortable conversing through the online medium.* Also 89.2% of the students responded strongly agreeing or agreeing with the item *I felt comfortable participating in the course discussions.* This finding of almost 90 percent of the students strongly agreeing or agreeing with this item indicates students’ acceptance of and willingness for open communication in the online environment.

Group Cohesion

For the last category, group cohesion (20 - 22) in the Social Presence element, 62.8 – 78.5 percent of the students responded strongly agreeing or agreeing. For the item, *online discussions help me to develop a sense of collaboration,* 62.8% of the students strongly agreed or agreed. For the other two items, *I felt comfortable disagreeing with other course participants while still maintaining a sense of trust* and *I felt that my point of view was acknowledged by other course participants,* 78.5% of students responded strongly agreeing or agreeing. This highlights the importance of having asynchronous discussion forums in the online courses to create an environment for students to interact and converse freely with their peers.

Cognitive Presence

To check the reliability of responses for items in each of the categories, Cronbach’s Alpha were calculated for each of the categories (triggering event, exploration integration, resolution) of
cognitive presence and the overall cognitive presence element. Table 11 provides the reliability information for the teaching presence. Among these categories, the triggering event had a reliability $\alpha = 0.898$, exploration had reliability $\alpha = 0.825$, integration had reliability $\alpha = 0.853$, resolution had a reliability $\alpha = 0.886$ and the overall cognitive Presence element had a reliability $\alpha = 0.946$. The alpha value for each of the groups and overall social presence were well above the recommended 0.7 for exploratory research studies.

Table 11

*Reliability statistics Cognitive Presence (Cronbach’s Alpha)*

<table>
<thead>
<tr>
<th>Event</th>
<th>Triggering</th>
<th>Exploration</th>
<th>Integration</th>
<th>Resolution</th>
<th>Overall Cognitive Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>$\alpha = 0.898$</td>
<td>$\alpha = 0.825$</td>
<td>$\alpha = 0.853$</td>
<td>$\alpha = 0.886$</td>
<td>$\alpha = 0.946$</td>
</tr>
</tbody>
</table>

*Note: n=121*

Descriptive statistics of mean, median, standard deviation, Q1, Q2 and range were used to provide details about the distribution of the responses collected from students. These details are tabulated in Table 12.
Table 12

Descriptive Statistics of Cognitive Presence

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Q1</th>
<th>Q3</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triggering Event (3 items)</td>
<td>11.28</td>
<td>12.00</td>
<td>2.86</td>
<td>10.00</td>
<td>13.00</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Exploration (3 items)</td>
<td>11.85</td>
<td>12.00</td>
<td>2.41</td>
<td>11.00</td>
<td>14.00</td>
<td>6.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Integration (3 items)</td>
<td>11.98</td>
<td>12.00</td>
<td>2.16</td>
<td>11.00</td>
<td>14.00</td>
<td>7.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Resolution (3 items)</td>
<td>11.49</td>
<td>12.00</td>
<td>2.54</td>
<td>10.00</td>
<td>13.00</td>
<td>4.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Cognitive Presence (12 items)</td>
<td>46.60</td>
<td>47.00</td>
<td>8.72</td>
<td>42.00</td>
<td>53.50</td>
<td>25.00</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Note: n=121,

Table 13 represents the frequencies for each item in the categories included in the Cognitive Presence and a combined total percentage of Strongly Agree and Agree for each of the items within the Cognitive presence element.

Table 13

Frequencies with the CoI Items and combined Strongly Agree (SA) and Agree (A)

<table>
<thead>
<tr>
<th>CoI survey Items (Cognitive Presence)</th>
<th>Triggering event</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. Problems posed increased my interest in course issues.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Course activities piqued my curiosity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I felt motivated to explore content related questions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I utilized a variety of information sources to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
explore problems posed in this course.

<table>
<thead>
<tr>
<th>Item</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. Brainstorming and finding relevant information helped me resolve content related questions.</td>
<td>31</td>
<td>60</td>
<td>22</td>
<td>7</td>
<td>1</td>
<td>75.2</td>
</tr>
<tr>
<td>28. Online discussions were valuable in helping me appreciate different perspectives.</td>
<td>35</td>
<td>57</td>
<td>15</td>
<td>8</td>
<td>5</td>
<td>76</td>
</tr>
</tbody>
</table>

### Integration

<table>
<thead>
<tr>
<th>Item</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. Combining new information helped me answer questions raised in course activities.</td>
<td>34</td>
<td>66</td>
<td>18</td>
<td>2</td>
<td>0</td>
<td>82.6</td>
</tr>
<tr>
<td>30. Learning activities helped me construct explanations/solutions.</td>
<td>32</td>
<td>61</td>
<td>19</td>
<td>8</td>
<td>1</td>
<td>76.8</td>
</tr>
<tr>
<td>31. Reflection on course content and discussions helped me understand fundamental concepts in class.</td>
<td>34</td>
<td>59</td>
<td>19</td>
<td>8</td>
<td>0</td>
<td>72.9</td>
</tr>
</tbody>
</table>

### Resolution

<table>
<thead>
<tr>
<th>Item</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
<th>%SA+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>32. I can describe ways to test and apply the knowledge created in this course.</td>
<td>28</td>
<td>62</td>
<td>16</td>
<td>11</td>
<td>2</td>
<td>74.3</td>
</tr>
<tr>
<td>33. I have developed solutions to course problems that can be applied in practice.</td>
<td>26</td>
<td>56</td>
<td>23</td>
<td>15</td>
<td>0</td>
<td>67.8</td>
</tr>
<tr>
<td>34. I can apply the knowledge created in this Course to my work or other non-class related activities.</td>
<td>30</td>
<td>69</td>
<td>11</td>
<td>9</td>
<td>1</td>
<td>81.8</td>
</tr>
</tbody>
</table>

Note: n=121, SD = Strongly Disagree (1), D = Disagree (2), NA/ND (3) = Neither Agree nor Disagree, A = Agree (4), SA = Strongly Agree (5)

**Triggering Event**

For the items (23 – 25) in the triggering event category, 59.5 – 73.5 percent of the students strongly agreed or agreed with the items. 59.5% of students strongly agreed or agreed that the problems posed increased my interest in course issues. Also 73.5% of the students responded strongly agreeing or agreeing with the statement, *I felt motivated to explore content related questions*. A significant number of students, almost 25%, neither agreed or nor disagreed with
most of the items in this category. This could mean that some of the undergraduate online
students didn’t see the course activities and problems as motivating them to explore more. They
just wanted to complete what was ask of them as requirements towards a successful completion
of the course.

**Exploration**

For the items (26 – 28) in the exploration category, 75.2 – 81.9 percent of the students strongly
agreed or agreed with all three items. 75.2% of the students strongly agreed or agreed with the
item *brainstorming and finding relevant information helped me resolve content related
questions*. For the item, *I utilized a variety of information sources to explore problems posed in
this course*, 81.9% of the students strongly agreed or agreed. This data shows that students really
liked the required and supplemental materials -- from YouTube, PBS, CDC and other health
related resources -- that helped them to explore problems in these online courses.

**Integration**

For the items (29-31) in the integration category, 72.9 – 82.6 percent of the students strongly
agreed or agreed with the items. 72.9% of the students agreed with the item, *Reflection on
course content and discussions helped me understand fundamental concepts in class. Also
82.6% of the students strongly agreed or agreed with the item combining new information
helped me answer questions raised in course activities.* Neither agree nor disagree was not
significant for the items in this category. These responses show the importance of providing
new information to help students with their learning of tougher concepts. Also it is clear that the
students perceived the opportunity for reflection as helpful in their understanding of basic
concepts related to these courses.
Resolution

For the last three items in the category, under resolution, 67.8 – 81.8 percent of the students strongly agreed or agreed with the items. For the item, *I have developed solutions to course problems that can be applied in practice*, 67.8% of the students responded strongly agreeing or disagreeing. Also 81.8% of the students strongly agreed or agreed with the item, *I can apply the knowledge created in this course to my work or other non-class related activities*. These responses from the students demonstrate positive perceptions on their learning in these courses with most believing that they could use what they learned in these courses in real life scenarios to solve problems.

Summary of Findings for Research Question 1:

*Undergraduate students’ perception of Teaching Presence in the online courses:*

Out of the three categories under teaching presence, the category of design and organization of the online courses received positive responses from more than 85% of the undergraduate online students. Especially in their perceptions of how well their instructors communicated due dates and time frames, almost 91% students responded positively. In the facilitation category within the teaching presence, almost 60% of the students had positive responses. However, the remaining 40% didn’t give negative rating in these items, rather, a significant about 35% responded neither agree nor disagree, thus taking a neutral position with their responses.

Finally, for the direct instruction category students had mixed responses. Almost 74% of the students agreed or strongly agreed that the instructor provided feedback. However, only about 60% agreed or strongly agreed that they had received specific and personal feedback.
This shows that the students expect even more specific and extensive feedback from their instructors that can help them figure out their strengths and weaknesses.

**Undergraduate students’ perception of Social Presence in the online courses:**

For the social presence element, affective expression received a very low positive response from the students. Especially for sense of belonging in the course, only 38% of the students agreed or strongly agreed with the statement *getting to know other course participants gave me a sense of belonging in the course*. However, another category, open communication, received more than 80% positive responses from the students, showing that online students are very comfortable communicating in the open online space. Particularly a 90 percent positive response for the statement, *I felt comfortable participating in the course discussions* shows that the students are comfortable conversing through online discussion forums. Group cohesion also received significant positive responses from the students with almost 79% responding positively for these survey items under this category. More than 63% of the students thought the online discussions helped them develop a sense of collaboration through interactions that helped them stay together as a cohesive group and to collaborate comfortably in this environment.

**Undergraduate students’ perception of Cognitive Presence in the online courses:**

Cognitive Presence received mostly positive responses from undergraduate online students. Most of the participants responded positively on the items under all four categories, namely: triggering event, exploration, integration and resolution. More than 80% responded positively on the variety of material presented in these courses. A significant number (82%) of students responded positively that they could apply knowledge created in the course to work or non-class-related activities.
Research Question 2:

What are the differences in undergraduate students’ perceptions of teaching, social and cognitive presences in online courses based on their age, gender, class standing, online experience, course enrollment, and course duration?

For each of the categories under teaching, social, and cognitive presences, mean, median and standard deviation were calculated and used to show the data distribution among undergraduate online students’ responses. In order to explore the differences in undergraduate students’ perceptions of their teaching, social, and cognitive presences based on their age, gender, class standing, online learning experience, course enrollment and enrolled course duration, non-parametric statistical tests were used to show the significance of the differences in perceptions between the groups. Based on the descriptive analysis, non-parametric tests on the median values were determined to be appropriate to answer research question 2.

To analyze the differences and contrasts in perceptions based on demographic variables with two groups such as age (18-24, 25 and above), enrolled course duration (full semester, half semester), and course enrollment (online only, online and traditional), the Mann-Whitney U Test was used, while the Kruskal-Wallis test was used for demographic variables with three groups including class standing (Freshman and sophomore, Junior, senior) and online learning experience (None, 1-2, More than 2). These tests were run for each of the categories under social, teaching and cognitive presence for the five demographic variables mentioned above. The researcher recognizes the need for running multiple tests to analyze this data and at the same time acknowledges the influence of Type I error on these tests. However, research Question 2 necessitates individual tests as a way to make sense of the differences in student perceptions.
between each of these categories based on the demographic variables. Differences in perceptions based on gender were not analyzed of because of the larger female students’ responses for this study (89% female and 11% male).

Table 14 provides the mean, median, standard deviation and the p-value for each of the categories under, teaching, social and cognitive presences based on the demographic variables age and class standing.

Table 14

*Tests of significance based on Age and Class standing*

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Class Standing</th>
<th>p-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18 – 24</td>
<td>25 and above</td>
<td>Freshman/sophomore</td>
<td>Junior</td>
</tr>
<tr>
<td>Teaching Presence (TP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design and organization (TP1)</td>
<td>Mean</td>
<td>16.79</td>
<td>16.85</td>
<td>17.20</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>(16.5)</td>
<td>(18.0)</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.50</td>
<td>3.63</td>
<td>2.55</td>
</tr>
<tr>
<td>Facilitation (TP2)</td>
<td>Mean</td>
<td>21.0</td>
<td>22.10</td>
<td>22.54</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>(22.0)</td>
<td>(23.0)</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>5.64</td>
<td>6.39</td>
<td>5.54</td>
</tr>
<tr>
<td>Direct Instruction (TP3)</td>
<td>Mean</td>
<td>10.81</td>
<td>11.33</td>
<td>11.66</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>(11.5)</td>
<td>(12.0)</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.90</td>
<td>3.25</td>
<td>2.97</td>
</tr>
<tr>
<td>Social Presence (SP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective Expression (SP1)</td>
<td>Mean</td>
<td>9.08</td>
<td>10.37</td>
<td>9.66</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>(9.0)</td>
<td>(11.0)</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.96</td>
<td>2.389</td>
<td>2.79</td>
</tr>
</tbody>
</table>
### Open Communication (SP2)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>11.83</td>
<td>(12.0)</td>
<td>2.45</td>
<td>2.10</td>
<td>1.81</td>
</tr>
<tr>
<td>Median</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td></td>
<td>(12.0)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>SD</td>
<td>2.45</td>
<td>2.10</td>
<td>2.34</td>
<td>1.81</td>
<td>2.55</td>
</tr>
</tbody>
</table>

### Group Cohesion (SP3)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>10.77</td>
<td>(11.0)</td>
<td>2.299</td>
<td>2.212</td>
<td>2.79</td>
</tr>
<tr>
<td>Median</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td></td>
<td>(12.0)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>SD</td>
<td>2.299</td>
<td>2.212</td>
<td>2.79</td>
<td>2.25</td>
<td>2.05</td>
</tr>
</tbody>
</table>

### Cognitive Presence (CP)

#### Triggering Event (CP1)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>10.41</td>
<td>(11.0)</td>
<td>2.97</td>
<td>2.64</td>
<td>2.80</td>
</tr>
<tr>
<td>Median</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td></td>
<td>(12.0)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>SD</td>
<td>2.97</td>
<td>2.64</td>
<td>2.80</td>
<td>3.19</td>
<td>2.71</td>
</tr>
</tbody>
</table>

#### Exploration (CP2)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>11.58</td>
<td>(12.0)</td>
<td>2.55</td>
<td>2.22</td>
<td>2.42</td>
</tr>
<tr>
<td>Median</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td></td>
<td>(12.0)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>SD</td>
<td>2.55</td>
<td>2.22</td>
<td>2.42</td>
<td>2.24</td>
<td>2.44</td>
</tr>
</tbody>
</table>

#### Integration (CP3)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>11.62</td>
<td>(12.0)</td>
<td>2.29</td>
<td>2.06</td>
<td>2.25</td>
</tr>
<tr>
<td>Median</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td></td>
<td>(12.0)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>SD</td>
<td>2.29</td>
<td>2.06</td>
<td>2.25</td>
<td>2.19</td>
<td>2.14</td>
</tr>
</tbody>
</table>

#### Resolution (CP4)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>11.18</td>
<td>(12.0)</td>
<td>2.65</td>
<td>2.52</td>
<td>2.57</td>
</tr>
<tr>
<td>Median</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td></td>
<td>(12.0)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>SD</td>
<td>2.65</td>
<td>2.52</td>
<td>2.57</td>
<td>2.98</td>
<td>2.25</td>
</tr>
</tbody>
</table>

NS = No significance S = Significance. The significance level is .05.

### Differences in perceptions of Teaching, Social and Cognitive presences based on Age:

For data analysis purposes the demographic variable age was recoded into two groups, 18-24 and 25 and above. The differences in perceptions were calculated using the Mann-Whitney U Test to show patterns of significance. Undergraduate students’ perceptions of design and organization, facilitation and direct instruction under teaching presence showed no significant differences among the two age groups of students.
Under social presence, affective expression and group cohesion showed that the undergraduate students 18–24 and 25 and above had significantly different perceptions regarding getting to know their fellow students and socially interacting with them in the online medium. Their perceptions also differed on the collaboration aspect of online learning such as disagreeing with their peers in discussions and also feeling like their points of view on the discussion questions were acknowledged by their peers. However, there is no significant difference between the perceptions of these two groups on the open communication aspects of teaching presence in the online courses. Almost 80-90 percent of the students felt comfortable conversing, participating and interacting with other students in the course through the online medium.

In three out of four categories of cognitive presence (exploration, integration and resolution), there were no significant differences in students’ perceptions. However, students’ perceptions did show a significant difference on the aspect of the triggering event of this presence pointing towards different expectations and perceptions on the course activities and how those activities helped them to explore content related questions and issues in the online courses.

Differences in perceptions of Teaching, Social and Cognitive presences based on Class standing:

To analyze the differences in perceptions based on class standing, the groups were recoded into three new groups, a combined group of freshman/sophomore, junior and senior. The Kruskal-Wallis test was used to calculate and show the differences between undergraduate students’ perceptions. With these three groups, perceptions of social, teaching, and cognitive presences showed no significant differences based on their class standing. Irrespective of their groups
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

(freshman/sophomore, junior, or senior), their perceptions on the presences stayed the same. This shows that class standing is not a significant variable in understanding the differences in undergraduate online students’ perceptions of presences in the online environment.

Table 15 provides the mean, median, standard deviation and the p-value for each of the categories under teaching, social and cognitive presences based on the demographic variables of online course experience, course enrollment and course duration.

Table 15

Tests of significance based on course enrollment, online learning experience and enrolled course duration

<table>
<thead>
<tr>
<th>Course Enrollment</th>
<th>Online Learning Experience</th>
<th>Enrolled Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online only</td>
<td>Online and in-class</td>
<td>p-value</td>
</tr>
<tr>
<td>None</td>
<td>1-2</td>
<td>More than 2</td>
</tr>
<tr>
<td>15 weeks</td>
<td>7.5 weeks</td>
<td>p-value</td>
</tr>
</tbody>
</table>

Teaching Presence (TP)

<table>
<thead>
<tr>
<th>Design and organization (TP1)</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>16.52</td>
<td>17.09</td>
<td>3.50</td>
</tr>
<tr>
<td>Median</td>
<td>17.09</td>
<td>17.09</td>
<td>3.00</td>
</tr>
<tr>
<td>SD</td>
<td>16.53</td>
<td>16.89</td>
<td>3.38</td>
</tr>
<tr>
<td>p-value</td>
<td>16.91</td>
<td>16.56</td>
<td>4.05</td>
</tr>
</tbody>
</table>

Facilitation (TP2)

<table>
<thead>
<tr>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.8</td>
<td>21.5</td>
<td>2.91</td>
</tr>
<tr>
<td>23.09</td>
<td>20.35</td>
<td>6.09</td>
</tr>
<tr>
<td>21.91</td>
<td>21.41</td>
<td>6.14</td>
</tr>
<tr>
<td>22.33</td>
<td>21.91</td>
<td>6.27</td>
</tr>
<tr>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

Direct Instruction (TP3)

<table>
<thead>
<tr>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.96</td>
<td>11.25</td>
<td>1.48</td>
</tr>
<tr>
<td>11.54</td>
<td>10.67</td>
<td>5.39</td>
</tr>
<tr>
<td>11.21</td>
<td>11.02</td>
<td>6.27</td>
</tr>
<tr>
<td>11.4</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

Social Presence (SP)

<table>
<thead>
<tr>
<th>Affective Expression (SP1)</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>10.16</td>
<td>9.56</td>
<td>2.5</td>
</tr>
<tr>
<td>Median</td>
<td>10.27</td>
<td>8.89</td>
<td>2.86</td>
</tr>
<tr>
<td>NS</td>
<td>10.12</td>
<td>9.37</td>
<td>2.53</td>
</tr>
<tr>
<td>NS</td>
<td>12.2</td>
<td>S</td>
<td>2.77</td>
</tr>
</tbody>
</table>

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Open Communication (SP2)
Mean 12.4 12.24 11.90 11.39 12.70 12.12 12.86
Median (12.0) (12.0) NS (12.0) (12.0) (12.0) S (12.0) (12.0) NS
SD 1.96 2.53 2.62 2.16 2.19 2.39 1.85

Group Cohesion (SP3)
Mean 11.32 11.37 11.54 9.85 11.85 11.18 11.83
Median (12.0) (12.0) NS (12.0) (10.0) (12.0) S (12.0) (12.0) NS
SD 2.35 2.24 2.58 2.35 2.00 2.37 2.00

Cognitive Presence (CP)

Triggering Event (CP1)
Mean 11.4 11.25 11.72 11.0 11.38 11.08 12.03
Median (12.0) (12.0) NS (12.0) (12.0) (12.0) NS (11.0) (12.0) NS
SD 2.83 2.93 2.24 2.89 2.96 2.97 2.47

Exploration (CP2)
Mean 11.85 12.03 12.45 11.21 12.14 11.73 12.56
Median (12.0) (12.0) NS (12.0) (11.5) (12.0) NS (12.0) (12.0) NS
SD 2.51 2.25 1.91 2.43 2.37 2.50 1.83

Integration (CP3)
Mean 12.07 11.96 12.72 11.60 12.06 11.83 12.53
Median (12.0) (12.0) NS (12.0) (12.0) (12.0) NS (12.0) (12.0) NS
SD 2.18 2.18 1.90 2.18 2.20 2.193 2.08

Resolution (CP4)
Mean 11.36 11.61 11.45 11.32 11.56 11.26 12.16
Median (12.0) (12.0) NS (12.0) (12.0) (12.0) NS (12.0) (12.0) NS
SD 2.59 2.57 2.62 2.62 2.58 2.77 1.76

NS = No Significance; S = Significance. The significance level is .05.

Differences in perceptions of Teaching, Social and Cognitive presences based on Course enrollment:

The differences in perceptions were calculated using the Mann-Whitney U Test to show the significance. Undergraduate student perceptions of teaching, social and cognitive presences didn’t differ significantly based on their course enrollment. Whether they were registered for online only or online and in-class courses had no effect on their perceptions of social, teaching and cognitive presences. This shows that course enrollment is not a significant variable in understanding differences in undergraduate online students’ perception of social, teaching and cognitive presences in the online environment.
Differences in perceptions of Teaching, Social and Cognitive presences based on online learning experience:

The Kruskal-Wallis test was used to analyze undergraduate students’ perceptions, and their responses from this study did not show a significant difference in their perceptions of teaching presence based on their online learning experience. All three groups of students (no online experience, taken 1-2 courses before, and more than 2 courses before) had the same perceptions on the teaching presence aspects of their online courses.

Under social presences there were also no significant differences in perceptions within the three groups on Affective expression. However, on the issue of the open communication and group cohesion aspects of online learning their levels of comfort with conversing, participating and interacting in the online environment differed based on their online learning experience. They also had significant differences in perceptions of collaboration in the online environment as well as of agreeing with other participants and recognizing how their points of view were acknowledged by their peers.

This shows that age and online learning experience had a significant effect on students’ perception of collaboration and group cohesion in the online learning environment. The non-parametric analysis also showed that the aspects of cognitive presence such as triggering event, exploration, integration and resolution had no significant difference in students’ perceptions based on their online learning experience.
Differences in perceptions of Teaching, Social and Cognitive presences based on enrolled course duration:

The differences in perceptions were calculated using the Mann-Whitney U Test, which showed that undergraduate students enrolled in the full-semester and half-semester showed no significant differences in their perceptions on the aspect of teaching presence. In the social presence element, their perceptions did not differ significantly regarding the open communication and group cohesion aspects of the presence. However, their perceptions of affective expression did differ based on the course duration. Undergraduate online students’ perceptions also differed on getting to know other students and their social interaction through online media. These results could be explained because of the fact that the half semester condensed course had more work for them to do that didn’t give them enough time to get to know their fellow students and interact with them socially in the online environment.

There were no significant differences in students’ perceptions of cognitive presence such as triggering event, exploration, integration and resolution based on their enrolled course duration. Both full semester and half semester students had same perceptions on these aspects of cognitive presence in online learning.

Summary of Findings for Research Question 2:

This study used non-parametric data analysis to show the differences in perceptions of undergraduate students and resulted in the following findings. Based on age, undergraduate students had no significant difference in their perceptions of teaching presence. However, they did show a significant difference in perceptions regarding affective expression and group cohesion of their social presence in online learning, although they did seem to agree on the open
communication aspect of the social presence. While their perceptions of the triggering event aspect of the cognitive presence also differed significantly, the other three aspects of cognitive presence -- including exploration, integration and resolution -- didn’t show any significant differences.

With regards to class standing as well as with course enrollment, this study didn’t identify any significant differences in undergraduate online students’ perceptions of the teaching, social and cognitive presences. With regards online learning experience, this study didn’t identify any significant differences in the aspects of teaching presence. On social presence, although it showed significant differences in online students’ perceptions of open communication and the collaboration aspects of the presence, there were no significant differences in their responses for affective expression based on their online learning experience. Finally, the students’ perceptions didn’t differ on the aspects of cognitive presence based on their online learning experience.

For the affective expression aspect of social presence, undergraduate online students differed in their perceptions based on their enrolled course duration. There were, however, no significant differences found on any other aspects of teaching, social and cognitive presences based on their enrolled course duration.

**Interrelation between overall Learning and Satisfaction**

In addition to the two major research questions, this study also explored the interrelation between undergraduate online students’ perceptions of their overall learning and satisfaction in online courses. A crosstab analysis was used to provide details on the interrelationships between students’ responses for their overall learning and satisfaction in the online courses.
Table 16

Interrelationship between overall learning and satisfaction

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>NA/ND</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall, I was</td>
<td>SD</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>satisfied with this</td>
<td>D</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>course</td>
<td>NA/ND</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>0</td>
<td>2</td>
<td>8</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

SD = Strongly Disagree, D = Disagree, NA/ND = Neither Agree nor Disagree, A = Agree, SA = Strongly Agree

Out of the 121 students who responded to the surveys, 35 students reported that they were satisfied with their online course and learned much in the course. Similarly, 38 students reported “strongly agree” to both overall learning and satisfaction. This shows that there is no significant difference between perceptions of overall learning and perceptions of satisfaction among undergraduate online students.

Since the perceptions of levels of learning and of satisfaction stayed the same among undergraduate online students this study suggests that students who were satisfied with their courses had positive perceptions about their learning, whereas students who had negative perceptions on their overall satisfaction had negative perceptions on their overall learning.
Summary:

This chapter provides the data analysis and findings for this study. Descriptive analysis was used to explore undergraduate students’ perceptions of each of the categories of the CoI presences. The Mann-Whitney U and the Kruskal-Wallis non parametric tests were used to identify any differences in undergraduate online students’ perceptions of presences in the online environment. This study finding showed that, regarding specific categories of the presences, undergraduate students’ perceptions differed based on demographic variables such as age, online learning experience, and enrolled course duration, while class standing and course enrollment had no influence on students’ perceptions of presences in online environment.
Summary of the Study

The purpose of this study was to investigate undergraduate online students’ perceptions of the social, teaching and cognitive presences in relation to their learning and satisfaction in the online learning environment. This study used a non-experimental survey research design to explore these perceptions through the following two major questions:

1. What are the perceptions of undergraduate students regarding teaching, social and cognitive presences in online courses?
2. What are the differences in undergraduate students’ perceptions of teaching, social and cognitive presences in online courses based on their age, gender, class standing, online experience, course enrollment, and course duration?

Descriptive and non-parametric inferential statistical methods were used to analyze the results of the survey and thus to answer the research questions. Students’ perceptions of interaction were analyzed using the mean scores, frequencies and standard deviation. Further non-parametric analysis was used to investigate the differences in perceptions based on the age, gender, class standing, online learning experience, course duration, and course enrollment among the students.

Study findings:

To help understand undergraduate students’ perceptions of presences in relation to their learning and satisfaction in online courses, this study used the Community of Inquiry (CoI) conceptual framework. The three elements of the CoI framework – conceptualized as student-student
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(social), student-instructor (teaching), and student-content (cognitive) – were used to study student perceptions, and two major research questions were formed based on these CoI elements. In addition to student perceptions of learning and satisfaction, this study considered differences in those perceptions based on the effects of demographic characteristics such as age, gender, class standing, online learning experience, course enrollment, and course duration. In addition to the two major research questions, this study also explored the interrelation between student perceptions of their overall learning and also of their satisfaction in online courses.

Research Question 1:

What are the perceptions of undergraduate students regarding teaching, social and cognitive presences in online courses?

The first research question used the CoI survey framework to explore the levels of undergraduate students’ perceptions of social, teaching and cognitive presences in these online courses. Each of the elements of the CoI framework raised specific questions about students’ interactions with instructor, peers, and course content for each of the three presences and then used additional categories within the presences to further explore and further clarify the interactions within those elements and the levels of these perceptions.

The findings from this study on teaching presence shows that undergraduate students’ liked the design and organization of those courses that had clearly communicated expectations and deadlines. More than 85 percent of the students had positive perceptions on the design and organization of such courses. In the direct instruction aspects of teaching presence, students felt that they needed more specific and extensive feedback from their instructors to identify their strengths and weaknesses in this environment and in their learning. Finally, in the facilitation
category of teaching presence, almost 60 percent of the students had positive perceptions. However, a significant about 35 percent of the students’ reported neither agree nor disagree, thus taking a neutral position with their responses. This suggests a future follow up study specifically looking at the role of facilitation in online learning. A study could be conducted by providing additional open ended comments opportunity for students to explain the reasons for not responding positively or negatively to understand their expectations for the facilitation aspects of online learning.

Student responses regarding the social presence element showed that undergraduate online students liked the opportunity to communicate with their peers through online asynchronous discussions. More than 80 percent of the students had positive perceptions on open communication, showing that the students are comfortable openly communicating with their peers. They also perceived that asynchronous course discussions helped them to collaborate and learn from their peers through a sense of a cohesive group. However, affective expression aspects of social presence received a very low positive response from the students. Very few students thought that knowing other students personally gave them a sense of belonging in these courses. This could mean that undergraduate students like their interactions that are focused on their learning rather than interactions simply for the sake of getting to know personally other participants in their courses.

In terms of cognitive presence, students liked more supplemental and relevant information to help them to explore, relate to and reflect on the course material. In particular, a significant number of students (82%) believed that they could use their learning in these courses in other non-class related situations.
Overall, most of the undergraduate students had positive perceptions of teaching and cognitive presences that involved their interactions through the aspects of design and organization, instructors’ teaching presence and their learning through different cognitive phases in these online courses. Their levels of perceptions varied on some of the categories of the social presence that involved their interactions and collaboration with their peers. Further analysis on student responses based on the demographic characteristics in research question 2 will provide us more understanding of these differences in their perceptions.

**Research Question 2:**

*What are the differences in undergraduate students’ perceptions of teaching, social and cognitive presences in online courses based on their age, gender, class standing, online experience, course enrollment, and course duration?*

The CoI survey responses based on these demographic subgroups were used to investigate the differences in student perceptions and to answer this research question through the application of non-parametric data analysis.

The findings showed that undergraduate students ages 18-24 differed in their perceptions from those students who were 25 and above in terms of getting to know other students and socially interacting with them in the online medium. Besides that, they had other significant differences in the discussion and collaboration aspects of the online courses, particularly in terms of disagreeing with their peers as well as of getting their points of view acknowledged by their peers. Their opinions also varied on the issue of perceptions of course activities, and how those might have helped them to explore content related questions and issues. One common
characteristic of these online students is that they all felt comfortable communicating, interacting and collaborating with their fellow students through the online medium.

Undergraduate students’ prior online learning experience also had a significant influence on some of the aspects of their perceptions of presences in the online environment. Their levels of comfort in interacting with other students and participating in course activities differed based on their learning experience, a preference further reflected in their perceptions of collaboration in the discussion forums. Similarly they differed in their perceptions of knowing and interacting with other students in the online learning environment based on their enrolled online course duration (such as full semester and half semester).

With regards to class standing, this study didn’t show any significant difference in undergraduate online students’ perceptions of the teaching, social and cognitive presences nor was there any significant difference on the issue of course enrollment. Through these findings, this study highlights the effects of demographic characteristics such as age, online learning experience and enrolled course duration in the undergraduate student perceptions of presences in online courses. It helps us to understand these students’ perceptions of social interactions as well as differences in their opinions regarding discussions and the collaboration aspects of their learning and also their views on the course material and the usefulness of those materials for their learning. It is also important to note that some of the demographic characteristics such as class standing and course enrolment (online only or online and in-class) had no influence on their perceptions of presences in the online learning environment.
Discussion and Conclusions:

The purpose of this study was to investigate undergraduate online students’ perceptions of teaching, social and cognitive presences in relation to their learning and satisfaction in the online learning environment. This study also explored the differences, if any, in those perceptions based on some of the demographic characteristics. Most of the findings in this study are aligned with similar studies that focused on presences and interaction in online learning.

Undergraduate students’ perceptions of teaching presence in online courses

Most of the undergraduate students who responded to this study had positive perceptions about teaching presence that is, with those aspects of the CoI framework that deal with design and organization, facilitation and direct instruction. Findings from this study show that students had positive perceptions on the design and organization of the courses, responses that align with the literature which indicates that it is important for instructors to set up a clear structure and also clear learning expectations through their course design, learning activities and collaboration (Zydney et al., 2012). Also relevant here is the observation that the online courses in this study were designed based on the Quality Matters (QM) standards with a simple overall organization as well as learning objectives articulated for the course as a whole as well as for individual modules within the course.

Students also had positive perceptions about their instructors’ communications regarding course activities and expectations, responding favorably to instructors clearly communicating their expectations for the course objectives as well as for student responsibilities towards achieving those objectives successfully. These findings align with other studies showing that students are more satisfied when they interact more with their instructors in the online
environment (Bray et al., 2008). In the online environment, instructor interactions and teaching presence can take a number of different forms, whether through the general communications that students receive through email and announcements, through the course material provided by the instructors, or through the individual feedback students receive (Wolf et al., 2011). Instructors in these courses used announcements and email regularly to summarize the main concepts to keep students focused in their learning. Findings from this study suggest clearly that such characteristics are important for successful teaching and learning in the online environment, as are qualities such as simple course organization, clear instructions and clearly communicated expectations.

It is also evident that undergraduate students liked more specific and more personal feedback. While most of the students in this study thought that their instructors provided timely feedback they also felt that they needed even more feedback and guidance than actually provided so as to help them to identify their strengths and weakness. This reinforces findings from similar studies suggesting the importance of aligning the perceptions of both the instructor and the students on the issue of providing feedback (Seok et al., 2010). Findings from this study could be interpreted as showing that students found the feedback to be timely but that they also wished for it to be more specific. Unlike graduate students, undergraduate students in the online environment need more personal feedback to help them identify their strengths and weaknesses, with other studies also highlighting this same perceived need for more guidance from online instructors (Kumar et al., 2011).

In similar fashion, undergraduate online students prefer more teaching presence in terms of facilitation and direct instruction in their courses, thus highlighting the role of the instructor as creator and orchestrator of online learning (Shea, Vickers, & Hayes, 2010). In the
online environment, instructors play a vital role in planning their course activities, facilitating learning, encouraging student-student, student instructor and student-content interactions, and providing the kind of individual learner specific-feedback that helps students to identify their strengths and weaknesses and to learn in the online environment.

In terms of the differences in teaching presences based on demographic characteristics, this study didn’t show any differences based on age, class standing, online learning experience, course enrollment, or enrolled course duration. Instead, it is clear that students’ perceptions of teaching presence are much more solidly based on their interactions with their online instructors through design and organization, facilitation and direct instruction. Irrespective of students’ demographic characteristics, the strategies and methods of teaching presence are essential to create and sustain learning communities through interaction and collaboration in the online environment (Bangert, 2009), and we can safely conclude that the demographic characteristics of these public health students had no influence on their perceptions of teaching presence in the online environment.

**Undergraduate students’ perceptions of social presence in online courses**

Social presence in online learning, as an aspect of the CoI framework, deals with affective expression, open communication, and group cohesion. This study supports current research in this area but also extends beyond that research to provide a more advanced level of understanding on specific aspects of social presence. Specifically, the findings show important differences in students’ perceptions on some of the aspects based on demographic characteristics. Such findings help us to advance our understanding of online teaching and learning because
social presence in the CoI framework is considered as the foundation for student interaction and collaboration (Garrison & Cleveland-Innes, 2005)

Studies show that social presence helps students interact and collaborate with their peers and also to project themselves as real people (Shea & Bidjerano, 2009). Even though students had an “introduce yourself” forum, an “open questions” forum, and other course-related discussion forums and activities to help them interact with other students in these courses, this study indicates that only a small percentage of students thought that getting to know other students gave them a sense of belonging in these courses, which suggests that very few students felt that they learned significantly better because of knowing other students personally. Such findings are supported by other studies indicating that the different aspects of interaction and social presence in online courses should focus on helping students to work with and benefit from their peers through collaborative activities for learning (Picciano, 2002), reflecting students’ agreement that interactions should focus on learning and not just on personal social interactions.

An overwhelming majority of the students in this study felt comfortable conversing, interacting and collaborating in the online environment. This reinforces the suggestion by Thomson (2010) that a quality online learning environment should provide opportunities for students to interact with the content and also with their peers. It is further clear that undergraduate students prefer more asynchronous discussions as a framework within which to collaborate and learn from their peers, perceiving such discussions as a way for them to stay together and collaborate as a cohesive group. Other studies also suggest that undergraduate students preferred more student-student interaction their courses (Knowles & Kerkman, 2007), and the responses from this study underline the importance of providing more collaborative opportunities for students to discuss and reflect on their learning. Having students develop their
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

course work and assignments individually, by contrast, takes away from valuable opportunities for them to reflect upon and reconsider their learning of more challenging concepts through interaction and collaboration with their peers.

At the same time, these undergraduate students perceived that these learning interactions were not designed for the purpose of personally getting to know other students. Going a step further, some of the students thought that knowing other students personally did not help them to develop a sense of belonging in the online environment. This supports Moore’s (2011, p. 113) argument that the primary focus of online courses should be to provide opportunities for students to participate in the learning process through a variety of interactions with their peers, teacher and learning materials, with the emphasis here on the role of interaction in helping students to participate in the learning process.

In summary, we can conclude that undergraduate students liked the interactions in the learning process that focused on collaboration with their peers, instructor and course material. They had positive perceptions about open communication and interactions through asynchronous discussions and interactions with other students through a variety of materials and activities. These conclusions strengthen the arguments by other researchers who have highlighted the importance of social presence and learner-learner interactions that connect geographically separated learners by encouraging collaboration and learning in the online environment (Ling, 2007).

In terms of the differences based on the demographic variables, these findings show that undergraduate students differed in their perceptions of affective expression and the group cohesion aspects of social presence based on their age, even though they all agree on the open
communication aspect of online learning. These differences based on age groups help us to advance our understanding of the assumption that, because of technology access and exposure, we might see differences in perceptions based on age groups (Mortagy & Boghikian-Whitby, 2010; Orellana, 2006). As expected, students’ online learning experience also had a significant effect on their perceptions of conversing, participating and interacting with other course participants. This could be because students with less experience in online courses lacked a more fully developed understanding about the value of these interactions and collaborations in the online environment, while students with more online experience seem better to recognize the need for open communication in the online environment. Also the enrolled course duration had an effect on students’ perceptions about the affective expression aspect of social presence. These students had significant differences in their views of taking time to know other students as well as socially interacting with them based on their enrolled course duration.

**Undergraduate students’ perceptions of cognitive presence in online courses**

In this study, students provided mostly positive responses to the CoI aspects of cognitive presence and learning, with cognitive presence associated with the learning phases of *triggering event, exploration, integrations and resolution* the online environment. Even though these aspects address important learning phases, teaching and social presence are still considered as the foundation of cognitive presence, since cognitive presence and learning depend on students’ interaction with their peers and on their instructor’s influence through the teaching presence in the learning environment. This fortifies the argument from other researchers that, with the goal of achieving higher levels of learning, students preferred more interaction with their peers and the instructor (Shu-Hui Hsieh & Smith, 2008).
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

Literature about online learning shows that different disciplines use different teaching strategies and methods (Arbaugh et al., 2010; Cassidy et al., 2008), with one particularly interesting finding in this study highlighting the positive perceptions of undergraduate students regarding the forms in which new material was provided to them for exploration, reflection, and learning in relation to the learning outcomes. These highly rated classes provided a variety of supplemental materials -- including web based articles, podcasts, and other multimedia resources (animations, videos, and other online media) -- to help students with their learning. At the same time, we need to consider the extent to which these findings are discipline specific, since public health, as a health-related discipline, of course relies heavily on relevant and current material so that students can understand the methods of analysis and application with reference to the most recent information available.

Students also agree about the value of asynchronous online discussions for purposes of brainstorming and also appreciating different perspectives, a finding that further supports the argument of usefulness of the CoI framework as a tool for better understanding students’ perceptions of a technology-enhanced environment (D. Randy Garrison et al., 2010). They perceived that providing a variety of materials and multiple opportunities to explore and consider those new materials through discussion and collaboration with their fellow students helped them with their learning. These positive perceptions of the exploration aspect of cognitive presence also supports the assumption that a sense of community is important in sustaining students’ educational experience and moving them to higher levels of learning such as the integration and resolution phases (Garrison & Kanuka, 2004; Zydney et al., 2012).

The overall success of a learning environment is thus measured by student learning and satisfaction with that environment, but is also measured by students’ confidence in their own
ability to apply the information and skills they learned from these courses within a real life setting. In that sense, one of the interesting findings from this study is that more than 80 percent of the students thought that they could now apply their learning to work or non-class related activities. They also perceived that they learned more from these online courses. This helps us to conclude that interactions, collaboration, and good facilitation will encourage students to learn and will also raise their confidence about accepting their learning and being satisfied with it.

Findings from this study that considered different age groups did not reveal any significant differences among undergraduate online students’ perceptions regarding aspects of the cognitive presence, with the exception of the triggering event aspect of the cognitive presence. Students in the age range 18-24 had different expectations and perceptions on the course activities and how those activities helped them to explore content related questions and issues in the online environment, than did students age 25 and above. This suggests the importance of future studies to help us better to understand these different perceptions and preferences about activities that trigger student learning and interest about exploring course content and concepts in online courses.

Current research already shows that the triggering event and exploration phases of cognitive presence need more social interaction and integration, and that the resolution phases needs more social interaction and teaching presences (Garrison et al., 2001). So it can be concluded that positive perceptions about social and teaching presences are essential for students’ positive perceptions about cognitive presence as well as about their perceived learning and satisfaction with their online courses. These findings are in agreement with other researchers who have reported that both social and teaching presence are correlated with the cognitive presence and that all three presences complement each other in essential ways for the
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

purpose of effective learning in the online environment (Arbaugh, 2008; Shea & Bidjerano, 2009). From the above arguments and from the findings from this study, then, we could conclude that undergraduate students’ positive perceptions about teaching and social aspects of CoI presences essentially helped them with their collaboration and learning, thus resulting in positive perceptions on the cognitive presence in these courses.

Demographic Considerations

From data about the demographic characteristics, it can be concluded that most of the students in this study took more than one online courses before these fall 2012 courses, with more than 50 percent of the students having taken both online and traditional classes in the same academic semester. In addition, almost 75 percent of the students preferred the full semester for a length or duration for their online courses. This study thus adds valuable information to current research in this area on the influences that undergraduate online students’ age, online learning experience and enrolled course duration can have on their perceptions of some of the social and cognitive presence aspects of the online environment. Students in the different sub-groups within these demographic characteristics showed significant differences in their perceptions of some of the aspects of social and cognitive presences. By contrast, their class standing and course enrolment (online only or online and in-class) had no influence on their perceptions of presences in the online learning environment.

Implications for Practice

In terms of practice, first of all, this study confirms the practicality of the CoI framework as a tool to study undergraduate online students’ perceptions of presences and to suggest practical implications based on those findings. It also highlights the interrelationships between
students’ perceived satisfaction and their learning in the online environment, since online students who had positive perceptions of their satisfaction also had positive perceptions about their learning. So it is important to know and understand such perceptions so as to better recognize student expectations about what would define a quality online learning environment. Mostly, undergraduate online students liked social, teaching and cognitive presences in their courses, findings from this study that provide some considerations that instructional designers and instructors need to reflect upon for the design and delivery of quality undergraduate online courses and programs.

**Design and organization:**

Students’ positive perception of the teaching presences -- which include the design and organization category -- shows the importance of a simple course structure, also of providing an overview for students to help them to understand the structure and know the various materials, activities and expectations. Online instructors should set attainable goals for their courses and make their expectations clear through their introductions, overview and syllabi. They should also provide course objectives and learning outcomes that are simple to understand and measurable. It is also important to align the objectives with course activities and make that alignment clear and available to students so that they can be aware of the expectations and learning needed for success in these courses. Besides setting goals and expectations, instructors also need to focus on communicating those expectations to students. What is more clear from this study than before is that students very much appreciate instructors’ clear documentation and communication of instructions for the course activities, due dates and time frames. The instructional designer and instructors in the courses in this study followed the QM-
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

based design standards, and students’ positive perceptions on these components of design and organization convey their appreciation of such aspects in these online courses.

**Interactions**

Students’ positive perceptions on their interactions and collaboration, and their willingness to be involved in open communication with their peers in this study shows that undergraduate students prefer more activities structured around student collaboration rather than activities structured around students working as individuals with the instructor. These findings are consistent with constructivist principles suggesting that learning takes place most effectively because of interaction through social, teaching and cognitive presences by the community involved in the learning process (MacLean & Asher, 2009; Shea et al., 2012). Students’ interactions with other students, the instructor and the course content are seen as essential components for a successful online environment. These positive perceptions of students in this study support the assertion from other literature that quality course design with constructivist principles will create, support and sustain learning communities through students’ collaboration with their peers, instructor and the learning environment (K. C. Powell & Kalina, 2009).

Other studies also suggest that students disliked their courses when they had less than expected interaction, and in some other cases instructors actually reduced interaction because of their belief that student didn’t want such interactions (Thomson, 2010). However, findings from this study rather show that undergraduate students like the interactions in their online courses that are focused on helping them collaborate with their peers and instructors for the purpose of learning. It also validates the argument that interaction between students, instructor and content is an essential component for a successful online learning environment (Swan, 2002).
Many other studies thus suggest that interactions have the potential to affect student learning in positive ways in the geographically separated environment of an online course (Shu-Hui Hsieh & Smith, 2008). Most of the students who responded to this study had positive perceptions about the interaction components of the courses. They are open to communicating with their fellow students if it helps them learn better in the online environment. They also reported that the interactions they had through the asynchronous discussions and other activities had in fact helped them to work as a cohesive group. These findings are also consistent with previous research studies that recommend creating conditions that support students’ interactions with their peers, instructor and content so as to create a quality online learning environment (Swan, 2002).

**Course delivery**

Course delivery is associated with the aspects of facilitation and direct instruction in the teaching presences. Most students in this survey perceived that providing relevant discussions, related to the topic under consideration, is important for them in exploring the course material and in learning. They also liked the instructors’ role in setting the conditions, guiding and encouraging these kinds of interactions. One important practical recommendation based on these findings is that instructors should create appropriate opportunities for students to interact via asynchronous discussions or other online tools. It is also equally important for instructors to monitor these discussions and provide timely, specific and constructive feedback for students.

The cognitive presence aspects of triggering event, exploration, integration and resolution, and student learning depend on instructor facilitation and on related aspects of the course delivery. Clear course design, focused interaction, and instructor facilitation are important in moving students through these phases and achieving more successful learning in the
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

online environment. There may be differences based on some of the demographic variables such as age, gender, online experience, course enrollment and controlled course duration. However, this study’s findings show that most students would appreciate seeing the above aspects of their expectations addressed in their undergraduate online courses.

In summary, it can be concluded that undergraduate online students’ positive perceptions of teaching, social and cognitive presences are closely related to their positive perceptions of student-student (social), student-instructor (teaching) and student-content (cognitive) interactions in the online environment. While they like those social interactions that occur through asynchronous discussions and other course activities, they did not regard those interactions as helping them to know other students more personally in the online environment, nor did they regard those interactions as helping them to learn more effectively in that environment. In other words, we may be seeing a shift in students’ perceptions about the importance of interaction and collaboration in the online environment as suggested by other research (Mortagy & Boghikian-Whitby, 2010). At the same time, students’ perceptions also show their ability to identify and differentiate these learning-oriented interactions from their personal interactions outside of their formal educational experience, thus explaining why they would indicate a preference for interactions in online courses that are designed only for their learning and not so much for getting to know other students better socially.

In general, then, it is clear that undergraduate online students express satisfaction with good course design and organization, interaction and course delivery, also that this satisfaction is related to their positive perceptions about their learning in the online environment. However, we need more studies that look more closely at and measure their actual learning in terms of their performance before we can conclude that these findings go beyond student perceptions and that

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these perceptions are closely correlated with positive learning in these online environments.

Also, it is important to remember that the sample population in this study includes all fall 2012 semester undergraduate online students from the College of Public Health. These interpretations and conclusions are based on the setting and sample population in this study.

The findings from this study add to existing understandings and to the body of knowledge about students’ perceptions of their presences and interactions in a quality online environment. These findings can thus help instructional designers and instructors to make informed pedagogical decisions about course design that will improve student satisfaction in the online environment as well as student learning. In particular, it is important to note that undergraduate students prefer more activities structured around student-to-student collaborations that help them to learn from their peers as well as from the course material. Such collaborations are particularly valued when they serve as essential components for successful learning in the online environment, since these collaborations help in understanding more complex concepts and ideas within the course material. It is thus clear that students’ communication with the instructor, their interaction with the material, and their collaboration with their peers are the essential components for their successful learning in the online environment. In similar fashion, all three of these interactions (student-student, student-instructor and student-content) are important in ways that complement each other in the online learning environment. So a quality online learning environment should have all of these interactions and modes of collaboration for student satisfaction and successful learning. Even though there are many differences in the perceptions and expectations of online students, they all agree on the importance of good design aspects as well as the instructor’s presence in their courses.
Recognizing students’ perceptions as well as student expectations for a quality online learning environment, then, the researcher makes the following recommendations that might prove helpful for anyone involved in the development of an online course or program:

- Create and adhere to simple structures and consistent navigation systems throughout the course and program.
- Provide an overview so that students can understand the structures and navigation systems as well as the various materials, activities and expectations that exist within those structures and systems.
- Create learning objectives/outcomes that are simple to understand, reasonably attainable, and measurable.
- Align course objectives/outcomes with authentic assessments and make the alignment clear and available to students so that they can be aware of the expectations and learning needed for their success in the course.
- Establish a high level of instructor presence in the course through the kind of feedback and guidance that students particularly appreciate from their instructor.
- Make expectations clear through frequent instructor communications, particularly regarding all course activities, due dates, and ongoing time frames.
- Create conditions for open communication through discussions and other group activities to help students work as a cohesive group and learn from each other.
- Provide relevant discussions related to the topic under study so that students can share ideas and reflect on those ideas so as to clarify and learn the more difficult concepts.
- Monitor these student-based discussions and provide timely, specific and constructive feedback where needed.
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- Provide individualized learning materials, resources and feedback for those students who need more help than what they normally would get from the courses so as to address the significant differences created by some of the demographic characteristics of the students.

Recommendations for future research

The intent in doing this research was to develop an increased understanding of undergraduate students’ perceptions of the presences in the online learning environment so as to help course designers and instructors in their development of higher quality online course that enhance student interactions and also student learning within the online environment.

Based on the literature and findings of this study, the following recommendations for future research are offered:

1. This study could be replicated with undergraduate students from other colleges or all online courses from a university.

2. This study could be expanded to include actual student performance in these courses, thus showing more clearly the relationship between students’ perceptions and their actual learning in online courses.

3. A study could examine the relationship between the instructors’ perceptions and student perceptions of social, teaching and cognitive presences.

4. A follow up case study could be conducted to focus in greater depth on those students who reply in such surveys that they neither agree nor disagree about various aspects of their online courses.

5. Instructors in face-to-face courses also, of course, use course management systems to enhance their courses with online discussions and activities. A study could investigate
students’ levels of perceptions of presences, learning and satisfaction in their online vs. their face-to-face courses.
References


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Richardson, J. C., & Swan, K. (2003). EXAMINING SOCIAL PRESENCE IN ONLINE COURSES IN RELATION TO STUDENTS' PERCEIVED LEARNING AND SATISFACTION. *JALN, 7*(1).

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Appendix A

Recruitment Letter
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(Date)

Sasikumar Benzigar
Doctoral Student
College of Education, University of Cincinnati, OH – 45221

Dear Participants,

My name is Sasikumar Benzigar. I am a graduate student in Curriculum and Instruction, University of Cincinnati. My specialization is Education and Knowledge Technologies.

I am conducting a research study about interactions, learning and satisfaction among undergraduate online students. This study is a part of my doctoral requirement.

You are invited to complete an anonymous online survey as part of my research study. Details about participating are given at the beginning of the survey. If you decide not to participate you may simply exit without completing the survey. But I hope you will be willing to share your opinions as part of my research.

Please click on the link below to learn more and to participate in the survey.

Link: Sasikumar Benzigar Doctoral Dissertation Survey

Thank you for your help.

Respectfully,

Sasikumar Benzigar

*Attached: Information sheet.
Appendix B

Information Sheet for Research
Information Sheet for Research

University of Cincinnati

Department: Curriculum and Instruction, CECH

Principal Investigator: Sasikumar Benzigar

Faculty Advisor: Carla Johnson Ed.D

Title of Study: A survey study of the association between Perceptions of Interactions, Learning and Satisfaction among Undergraduate Online Students

Introduction:

You are being asked to take part in a research study. Please read this paper carefully and ask questions about anything that you do not understand.

Who is doing this research study?

The person in charge of this research study is Sasikumar Benzigar of the University of Cincinnati (UC) Department Curriculum and Instruction of CECH. He is being guided in this research by Dr. Carla Johnson.

What is the purpose of this research study?

The purpose of this research study is to investigate students’ perceptions of interactions and its relationship with their learning and satisfaction in online courses.
Who will be in this research study?

About 600 people will take part in this study. You may be in this study if you are an undergraduate student taking at least one online course from the College of Public Health, Kent State University. You must be at least 18 years old to participate in this study.

What will you be asked to do in this research study, and how long will it take?

You will be asked to complete an anonymous online survey asking about your experiences with online learning.

It will take about 10 - 15 minutes.

Are there any risks to being in this research study?

It is not expected that you will be exposed to any risk by being in this research study.

Are there any benefits from being in this research study?

You may not get any direct benefit from taking part in this study. But, being in this study may help educators understand the role of interaction in online courses.

What will you get because of being in this research study?

You will not get anything because of being in this research study.

Do you have choices about taking part in this research study?

If you do not want to take part in this research study, you may exit out of the survey at any time.
How will your research information be kept confidential?

Your information will be kept confidential by keeping the research data on a password protected computer for three months after completing the study. After that it will be destroyed by Sasikumar Benzigar, the principal investigator

Agents of the University of Cincinnati may inspect study records for audit or quality assurance purposes.

What are your legal rights in this research study?

Nothing in this consent form waives any legal rights you may have. This consent form also does not release the investigator, the institution, or its agents from liability for negligence.

What if you have questions about this research study?

If you have any questions or concerns about this research study, you should contact Sasikumar Benzigar (benzigsi@mail.uc.edu) at 330-274-7074 or, you may contact the PI’s faculty advisor, Dr. Carla Johnson (johnsc2@ucmail.uc.edu) at 513-556-7158

The UC Institutional Review Board reviews all research projects that involve human participants to be sure the rights and welfare of participants are protected.

If you have questions about your rights as a participant or complaints about the study, you may contact the UC IRB at (513) 558-5259. Or, you may call the UC Research Compliance Hotline at (800) 889-1547, or write to the IRB, 300 University Hall, ML 0567, 51 Goodman Drive, Cincinnati, OH 45221-0567, or email the IRB office at irb@ucmail.uc.edu.

Do you HAVE to take part in this research study?
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

No one has to be in this research study. Refusing to take part will NOT cause any penalty or loss of benefits that you would otherwise have.

You may start and then change your mind and stop at any time. To stop being in the study, at any point of time during the survey, you may close down the browser.

BY TURNING IN YOUR COMPLETED SURVEY YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH STUDY.

PLEASE PRINT AND KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.
Appendix C

Survey Instrument
A survey study of the association between Perceptions of Interactions, Learning and Satisfaction among Undergraduate Online Students

Section I: Community of Inquiry Survey

Teaching Presence

Please read each statement and then select the appropriate answers by clicking the buttons located below each question.

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<th>Design and Organization</th>
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<td>1 The instructor clearly communicated important course topics</td>
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<td>2 The instructor clearly communicated important course goals.</td>
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<td>3 The instructor provided clear instructions on how to participate in course learning activities.</td>
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<td>4 The instructor clearly communicated important due dates/time frames for learning activities.</td>
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<td>5 The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.</td>
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<td>6 The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.</td>
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<td>7 The instructor helped to keep course participants engaged and participating in productive dialogue.</td>
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<td>8 The instructor helped keep the course participants on task in a way that helped me to learn.</td>
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<td>9 The instructor encouraged course participants to explore new concepts in this course.</td>
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Instructor actions reinforced the development of a sense of community among course participants.

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**Direct Instruction**

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<td>11</td>
<td>The instructor helped to focus discussion on relevant issues in a way that helped me to learn.</td>
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<td>12</td>
<td>The instructor provided feedback that helped me understand my strengths and weaknesses.</td>
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<td>13</td>
<td>The instructor provided feedback in a timely fashion.</td>
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**Section I: Community of Inquiry Survey**

**Social Presence**

Please read each statement and then select the appropriate answers by clicking the buttons located below each question.

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<td>14</td>
<td>Getting to know other course participants gave me a sense of belonging in the course.</td>
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<td>I was able to form distinct impressions of some course participants.</td>
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<td>16</td>
<td>Online or web-based communication is an excellent medium for social interaction.</td>
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**Affective expression**

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<tr>
<td>17</td>
<td>I felt comfortable conversing through the online medium.</td>
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</tr>
<tr>
<td>18</td>
<td>I felt comfortable participating in the course discussions.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19</td>
<td>I felt comfortable interacting with other course participants.</td>
<td></td>
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</tr>
</tbody>
</table>

**Open communication**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>I felt comfortable conversing through the online medium.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>18</td>
<td>I felt comfortable participating in the course discussions.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19</td>
<td>I felt comfortable interacting with other course participants.</td>
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</tbody>
</table>

**Group cohesion**
### PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>I felt that my point of view was acknowledged by other course participants.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Online discussions help me to develop a sense of collaboration.</td>
<td></td>
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</tbody>
</table>

### Section I: Community of Inquiry Survey

#### Cognitive Presence

Please read each statement and then select the appropriate answers by clicking the buttons located below each question.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triggering event</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>23</td>
<td>Problems posed increased my interest in course issues.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>24</td>
<td>Course activities piqued my curiosity.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>I felt motivated to explore content related questions.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>I utilized a variety of information sources to explore problems posed in this course.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>27</td>
<td>Brainstorming and finding relevant information helped me resolve content related questions.</td>
<td></td>
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</tr>
<tr>
<td>28</td>
<td>Online discussions were valuable in helping me appreciate different perspectives.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
PERCEPTIONS OF INTERACTION IN ONLINE LEARNING

<table>
<thead>
<tr>
<th>29</th>
<th>Combining new information helped me answer questions raised in course activities.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Learning activities helped me construct explanations/solutions.</td>
</tr>
<tr>
<td></td>
<td>Reflection on course content and discussions helped me understand fundamental concepts in this class.</td>
</tr>
</tbody>
</table>

**Resolution**

<table>
<thead>
<tr>
<th>Resolution</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>I can describe ways to test and apply the knowledge created in this course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>I have developed solutions to course problems that can be applied in practice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>I can apply the knowledge created in this course to my work or other non-class related activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section II: Satisfaction and Learning

Please read each statement and then select the appropriate answers by clicking the buttons located below each question.

**Satisfaction**

<table>
<thead>
<tr>
<th>Satisfaction</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Overall, I was satisfied with this course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Learning**

<table>
<thead>
<tr>
<th>Learning</th>
<th>SA</th>
<th>A</th>
<th>NA/ND</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>I learned much in this course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SA = Strongly Agree, A = Agree, NA/ND = Neither Agree Nor Disagree, D = Disagree, SD = Strongly Disagree
Section III: Demographic Information

Please read each statement and then select the appropriate answers by clicking the buttons located below each question.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Male</th>
<th></th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>Gender</td>
<td>Male</td>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>38</td>
<td>Age</td>
<td>18-19</td>
<td>20-21</td>
<td>22-24</td>
</tr>
<tr>
<td>39</td>
<td>Class Standing (Fall 2012)</td>
<td>Freshman</td>
<td>Sophomore</td>
<td>Junior</td>
</tr>
<tr>
<td>40</td>
<td>Online learning experience (number of online classes taken before Fall 2012)</td>
<td>None</td>
<td>1-2</td>
<td>More than 2</td>
</tr>
<tr>
<td>41</td>
<td>Course enrollment (Fall 2012)</td>
<td>Online only</td>
<td>Online and in-class (traditional)</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Enrolled course duration (Fall 2012)</td>
<td>Full semester (15 weeks)</td>
<td>Half semester (7.5 weeks)</td>
<td></td>
</tr>
</tbody>
</table>