ABSTRACT

AN EXAMINATION OF TEACHING AND COGNITIVE PRESENCE
IN AN ONLINE COMMUNITY OF INQUIRY

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Northern Illinois University, 2015
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This comparative case study utilizes the lens of the Community of Inquiry framework to provide a holistic view of the dynamics of interactions in two class sections of a graduate-level online course. Relationships between teaching and cognitive presence are examined through content analysis of student and instructor contributions in both the discussion board and material outside of the discussion board, as well as through participant perceptions using the CoI survey and interviews. Content analysis data revealed that students in both groups had similar levels and types of teaching presence, while the instructors had very different levels and types of teaching presence. Although one instructor had more than three times the content as the other, the levels of cognitive presence in the discussion board were similar in both groups, with most of the posts at the integration phase. However, the specificity of content-analysis data at the indicator level revealed that although most posts were at the integration phase, students engaged in little problem solving or hypothesis building. Less than one percent of all student posts, contributed by three of the twelve students, were at the resolution phase. Inclusion of a student paper in content analysis revealed that seven students reached the resolution phase, although no student reached resolution in both the discussion board and the paper. Identical pre-course design and organization elements for both groups suggest that design may lead students to a certain level, but a qualitative factor (i.e., the timing of instructor participation, the composition

of the posts, or both) may have more influence than the quantity of posts in moving students toward problem solving. Perception data revealed that more students perceive reaching the resolution phase than the content-analysis data suggest. Similarly, different indicators within teaching presence categories had different relationships to phases of cognitive presence. The study suggests the quality of instructor teaching presence posts is more important than the quantity and that the quality of student cognitive presence posts is more revealing than quantities. Reporting of data at the category or phase level may be misleading, and reporting at the indicator level may provide the most constructive information for instructors, instructional designers, and researchers to use in maximizing the capacity of an online course to promote students' higher order thinking.

NORTHERN ILLINOIS UNIVERSITY
DEKALB, ILLINOIS

MAY 2015

AN EXAMINATION OF TEACHING AND COGNITIVE PRESENCE IN AN ONLINE COMMUNITY OF INQUIRY

BY

JENNIE J. ASHER

A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE

DOCTOR OF EDUCATION

DEPARTMENT OF EDUCATIONAL TECHNOLOGY,
RESEARCH AND ASSESSMENT

Doctoral Director:
Pi Sui Hsu

ACKNOWLEDGEMENTS

This dissertation represents not only my seemingly unending labor of research and writing, but the truly unending "labors of love" from many people. I would like to thank my dissertation advisor, Dr. Pi Sui Hsu, for the countless hours she dedicated to this project. Her expertise in qualitative research, insightful suggestions, timely feedback, and persistent encouragement in the face of many obstacles was invaluable in bringing it to completion. I am also indebted to Dr. Thomas Smith, committee member, for his guidance in methodology and for his profound ability to lead me to evaluate data and articulate findings with precision and clarity. I thank Dr. Rebecca Hunt for serving on my committee as well, and for providing direction and wisdom in the midst of busy semesters.

I am profoundly grateful to Dr. Ardelle Pate for her assistance with coding. As I wondered, "Who in their right mind is going to volunteer to help me with all this data?" she demonstrated that the heart of a servant and a true friend does things that a "right mind" wouldn't do. I thank her for her time, insight, and the constant reminders, "You can do this!"

I am intensely thankful for the dedication of Gail Jacky, my writing coach *par excellence,* without whom I'd still be "stuck" on Chapter 1. For all the times she brought clarity to the "fog" in my brain and said "I'm proud of you" when I was ready to give up, I will always be grateful.

I also want to express my appreciation to the many others who assisted and encouraged me in both my doctoral studies and in this writing. Thanks to Ramona Tausz, Dr.

Jane Buerger, Cara Patton, and Amy and Lydia Tausz for their assistance with tasks such as cross-checking reference lists, checking spreadsheets, and transcription. Thanks to the professors and students in this study who allowed me to "sit in" on their class, and to the Blackboard administrator for providing me with the data. Thanks to my departmental colleagues who encouraged me, listened to my grumbling, and then told me to "get to work": Dr. Gary Bertels, Dr. Tom Von Hagel, Dr. Andy Steinmann, Dr. Robert Sorensen, Prof. Erin Real, and Prof. John Rhoads. Thanks to my friends who listened when I needed to "vent", offered encouragement, and gave up time together because I was "working on my dissertation" yet again. I am also grateful to my university's administration for their support of my doctoral studies and for granting a study leave to allow me to complete this work.

Finally, I am out of synonyms for "gratitude" (and all fail in expression anyway) as I acknowledge my husband, Joe. For the times he used his English teacher correcting pen on drafts of various chapters; the "together time" he gave up as I locked myself away to read, analyze, or write; the countless loads of laundry he did and hot dogs he had to eat when he was "fending for himself" for dinner; and, most of all, for encouraging me to finish this and for always believing that I could, I would need another 300+ pages to provide a "rich, thick description" of how grateful I am. But because neither of us is ready for that, this short paragraph will have to do.

DEDICATION

To my husband Joe,

whose love and support cannot be quantified

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CHAPTER 1

BACKGROUND

Thinking is the hardest work there is,
which is probably the reason why so few engage in it. (Henry Ford)

Henry Ford's ability to engage in the hard work of thinking had a profound impact on our society in the early 20th century. His capacity to analyze a situation, synthesize ideas, create a new product, and evaluate its effectiveness led him to pioneer the assembly line method of production, thereby increasing factory efficiency and revolutionizing industrial production. This innovation not only influenced the workplace and economy, it influenced education as well. Workers needed to be prepared for the assembly line, and educators equipped them with skills in reading, remembering, and following directions.

A century after Ford's ground-breaking use of technology in the assembly line, technological advancements continue to impact our society and shape the character of education. The launching of the World Wide Web in 1991 put a wealth of information literally at our fingertips, and students entering higher education today have acquired great proficiency in gathering and sharing online information. As the first generation of "Digital Natives" (Prensky, 2001, p.1), those who have grown up with digital technology, they see its power and have infused it into every area of their lives. At the same time, employers report that the ability of today's high school graduates to think critically falls short (Casner-Lotto & Barrington, 2006; Dziuban, Moakal, & Hartman, 2005). Of greater consequence, employers perceive critical thinking skills to be essential for the 21st century workplace. In a survey of

over 400 employers, 77.8% ranked the need for critical thinking skills as the most important skill workers would need in the next five years (Casner-Lotto & Barrington). More recently, in a survey commissioned by the Association of American Colleges and Universities, nearly all (93%) of the 318 executives from private sector and non-profit organizations agreed with the statement "a demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than [a candidate's] undergraduate major" (Hart Research Associates, 2013, p. 4).

As educators seek to develop practices and curricula that prepare students for success as workers and citizens in the 21st Century, we must move beyond the assembly line skills of reading, remembering, and following directions to the critical thinking skills necessary in the information age. In a seminal article on online learning, Garrison, Anderson, and Archer (1999) proposed that online learning can be a tool that engages students in these skills. In their "Community of Inquiry" (CoI; p. 88) model, they contend that the online environment is conducive to students' utilization of critical thinking skills when there are sufficient levels of three presences: *social presence, teaching presence, and cognitive presence* (Figure 1). This model has been extensively adopted and researched by many educators in an effort to understand the process of online learning. However, while each of the presences has been linked to student satisfaction and perceived learning, only recently has attention been directed to examination of its central claim of leading to higher order learning (Akyol & Garrison, 2011b; Rourke & Kanuka, 2009; Xin, 2012).

As researchers have examined the three elements of social presence, teaching presence, and cognitive presence, findings have consistently pointed to the importance of teaching presence in determining student satisfaction, perceived learning, and sense of

community (Garrison, 2007; Garrison & Cleveland-Innes, 2005; Garrison, Cleveland-Innes, & Fung, 2010; McLoughlin & Mynard, 2009; Meyer, 2003; Shea, Pickett, & Pelz, 2003). Teaching presence was described by Garrison et al. (1999) as consisting of three primary roles: *design and organization* of the course, *facilitating discourse*, and providing *direct instruction* of content. While there is evidence that design and organization influences critical thinking in students (Darabi, Arrastia, Nelson, Cornille, & Liang, 2011; Kanuka, 2005; Kanuka, Rourke, & Laflamme, 2007; Rourke & Kanuka, 2009; Rovai, 2007; Vaughan, 2010), there has been little examination of the teaching presence roles of facilitating discourse or direct instruction in promoting higher order cognition.

Figure 1. The Community of Inquiry framework (Garrison, Anderson, & Archer, 1999, p. 88).

The goal of this research was to examine the relationship between teaching presence and higher order thinking in an online course. To provide important pedagogical guidance for

online instructors, the study sought to understand the nature of the interactions between the students engaging in knowledge creation and instructors engaging in their roles of design and organization, facilitating discourse, and direct instruction.

This chapter presents the background and organization of the study, including its purpose, significance, and limitations. A brief discussion of its theoretical foundations is provided, including models of online learning communities and a description of the CoI framework.

Statement of the Problem

The delivery of online courses is becoming increasingly important in higher education, with courses more readily available than ever before. In a survey of 1,055 college and university presidents, 77% report that their institution offered online courses (Parker, Lenhart, & Moore, 2011). Of greater consequence, academic leaders are including online courses and programs in their growth strategies. According to Allen and Seaman (2011), 65% of more than 2,500 academic leaders cited online learning as a critical part of their long term plans. As both public and private institutions face increasing financial concerns, a primary motivating factor in offering online programs and courses is to increase revenue streams by reaching students who would otherwise not enroll, such as the non-traditional population or those who would otherwise not have access to the physical facilities (Bacow, Bowen, Guthrie, Lack, & Long, 2012; Radford, 2011). Other factors include meeting student demand for more flexible schedules, increasing course offerings, improving retention, and responding to facility issues (such as space constraints or facility costs) (Bacow et al.; Radford).

As institutions offer these courses, enrollment is growing at astounding rates. In the fall of 2010, more than 6.1 million students were enrolled in at least one online course in higher education (Allen & Seaman, 2011). This represented a 10% growth rate over the previous year, far exceeding the less than 1% pace for growth of the overall student population in higher education. Further, students who were taking at least one online course accounted for 31.3% of the overall higher education student population, a marked increase from 9.6% in 2002 (Allen & Seaman). College presidents predict that this growth will continue, with 50% believing that 10 years from now most of their students will take at least one online course (Parker et al., 2011).

While these trends may imply that online learning has been accepted by both institutional leaders and students, skepticism about its efficacy remains. More than 70% of American adults believe that an online course provides less educational value than a face-to-face course (Parker et al., 2011). Similarly Allen and Seaman (2012) report that in a study of 4,564 faculty, 66% said they believed learning outcomes for an online course were inferior or somewhat inferior to those of a face-to-face course. In contrast, the majority of administrators believe that outcomes in online courses are equal to or superior to those of face-to-face courses (Allen & Seaman; Parker et al.).

Skepticism about this delivery mode has led much of the early research in online learning to focus on comparing the effectiveness of online learning to face-to-face courses in achieving learning outcomes (Bekele & Menchaca, 2008; McDonald, 2002). Most institutions evaluate online courses in the same way traditional courses are evaluated, with student surveys. These are typically focused on student satisfaction and leave the institution

without any objective data about learning outcomes. It is clear that making a case for the efficacy of online courses will require more evidence of learning achievement.

While some researchers continue to compare delivery modes, many have moved on to examining teaching and learning within the online environment. Just as in the face-to-face learning environment, online educators need guidance in pedagogy. Therefore, research has begun to move toward an examination of how to use the online medium to effect learning achievement. Of particular interest has been research into whether this medium can facilitate students' use of the critical thinking skills needed in the information age.

To maximize the potential of online education, Harasim (2000) contends that decisions about design and delivery must be guided by our understanding of the nature of learning and knowledge. Perhaps the most popular model today for understanding the process of learning online and creating online environments conducive to higher-order learning outcomes is the CoI framework (Garrison et al., 1999). This model proposes that the elements of social presence, teaching presence and cognitive presence are "crucial prerequisites for a successful higher educational experience" (p. 87) or a "worthwhile educational experience" (p. 88). However, examinations of current literature (Maddrell, Morrison, & Watson, 2011; Rourke & Kanuka, 2009; Xin, 2012) have noted a failure to link the framework to its central claim of leading to levels of higher-order thinking, with even the researchers themselves calling for a greater focus on linking processes with outcomes (Akyol & Garrison, 2011b; Garrison, Anderson, & Archer, 2010; Garrison, Cleveland-Innes et al., 2010).

For the pedagogical guidance of online instructors, teaching presence is of particular interest. Teaching presence is described as "the binding element" in creating a CoI, with

social and cognitive presence "dependent upon the presence of a teacher" (Garrison et al., 1999, p. 96). Failure to reach higher levels of cognitive presence have been linked to issues of teaching presence (Akyol, Arbaugh, et al., 2009; Garrison, 2007), but it is important to note that in most studies cognitive presence was measured by student perceptions, not actual evidence of critical thinking. While teaching presence seems to impact sense of community (Garrison & Arbaugh, 2007), student satisfaction, perceived learning (Garrison & Arbaugh; Kupczynski, Ice, Wiesenmayer, & McCluskey, 2010), and grades (Kupczynski et al.), its relationship to measures of higher level thinking is not clear.

While some scholars have begun to examine the role of design and organization by studying the impact of varying course designs or discussion strategies on cognitive presence (Darabi et al., 2011; Kanuka, 2005; Kanuka et al., 2007; Rourke & Kanuka, 2009; Rovai, 2007; Vaughan, 2010), little exploration of online pedagogy has been done in the form of examining the relationship of the other roles (i.e., facilitating discourse or direct instruction) on content-based evidence of higher-order cognition. Examination of these roles would be informative for online instructors as they engage their students.

Purpose of the Study

As the demand for online courses continues to increase, more institutions and educators in higher education are faced with both the challenge and opportunity to harness the power of the Internet not merely to meet student demand or interest, but as a tool for developing the skills needed for the future. As they consider the needs of a society where information is increasing exponentially, it is especially necessary that educators develop best practices in online learning for promoting critical thinking skills, "the *sine qua non* of higher

education" (Kanuka, 2005, The Problem section, para. 1). Many educators struggle with how the shift to online delivery impacts pedagogy. Are they simply to convert "the sage on the stage" to "the sage on the screen" through video or audio clips? How do they interact with students in a way that maximizes opportunities for learning? Simply recreating the classroom experience through video lectures, text, or other media can limit the potential of online education.

In developing the CoI framework, Garrison et al. (1999) examined postings from computer conferences used for educational purposes. They identified indicators of each of the presences through the occurrence of key words or phrases, which they contend can be used as a template or tool for researchers "as well as a guide to educators for the optimal use of computer conferencing as a medium to facilitate an educational transaction" (p. 87). The indicators of each presence will be discussed in Chapter 2.

The purpose of this study was to examine the construct of teaching presence and its relationship to students' use of higher order thinking skills in two class sections of a graduate level online course. The study used communication both in and outside of the discussion board activities to explore relationships between levels of teaching presence and the levels of cognitive presence.

Research Questions

This study examined the following research questions:

1. What patterns of teaching presence and cognitive presence develop in an online course?
    a. What patterns of student teaching presence develop in the discussion forum?

   b. What patterns of instructor teaching presence develop in the discussion forum?
   c. What patterns of instructor teaching presence as demonstrated by multiple data sources develop in the course?
   d. What patterns of student cognitive presence develop in the discussion forum?
2. What is the relationship between teaching presence and content-based cognitive presence?
   a. What is the relationship between student teaching presence and content-based cognitive presence in the discussion forum?
   b. What is the relationship between instructor teaching presence and student content-based cognitive presence in the discussion forum?
   c. What is the relationship between instructor teaching presence as demonstrated by multiple data sources and student content-based cognitive presence in the final projects?
3. What is the relationship between student-reported cognitive presence and content-based cognitive presence?
   a. What is the relationship between student-reported cognitive presence and content-based cognitive presence in the discussion forum?
   b. What is the relationship between student-reported cognitive presence and content-based cognitive presence in the final projects?

Delimitations

Two theoretical considerations limited the scope of this study. First, although the CoI framework considers the three presences (i.e., social, teaching, and cognitive) to be

interdependent, the content analysis in this study did not include social presence. A large corpus of literature already exists that supports the notion that social presence is an important factor in both students' satisfaction and learning (Garrison & Cleveland-Innes, 2005; Richardson & Swan, 2003; Shea & Bidjerano, 2009b; Swan & Shih, 2005; Wallace, 2003). The relationship of social presence to both teaching and cognitive presence has also been widely studied (Garrison, Anderson, et al., 2010; Garrison & Cleveland-Innes, 2005; Garrison, Cleveland-Innes et al., 2010; Shea & Bidjerano, 2009a). Due to the volume of research already available on social presence, and to increase the manageability of the present study, the content analysis was limited to teaching and cognitive presence. The second theoretical limitation in the present study resulted from the complexity of the teaching presence construct. Recent studies have explored whether this construct is better described as consisting of two, three, or even four roles (Arbaugh, 2007; Garrison, Anderson, et al.; Shea, Li, Swan, & Pickett, 2005; Shea, Vickers, & Hayes, 2010). For the purpose of this study, teaching presence was defined and content analysis was carried out using the three-category model. This model has guided most of the CoI research, and it has been the most frequently validated. Finally, it afforded a delineation of categories and indicators consistent with the items in the survey instrument.

The scope of this study was also limited to an examination of instructor – student interactions in only one academic discipline. Studies using the content analysis tools with acceptable levels of inter-rater reliability as well as studies finding the CoI survey to be valid have primarily studied courses in the field of education. To limit possible extraneous variables, the present study also examined courses in education.

Finally, this study investigated the instructor – student interactions and the levels of student cognition in a graduate level course. Students were also practicing professionals in education. The scope of this study was therefore limited to students with both prior experience in higher education coursework and professional experiences related to the course content.

Theoretical Framework

This section offers an overview of online learning communities. It also provides a brief overview of the CoI framework.

Learning Communities

A growing number of researchers in online education base their practices on the premise that learning is a social and collaborative activity, most effectively occurring in a community of learners (Garrison, Anderson, & Archer, 1999; Lave & Wenger, 1991; Nonaka, Toyama, & Konno, 2000; Wenger, 2006). Knowledge is seen as constructed by the learner in a given context through critical analysis of subject matter. The context for this activity is a realistic and relevant collaborative environment in which interactions between students as well as student-instructor interactions provide the direction for making sense of the material (Wallace, 2003). The process is collaborative as participants question information and challenge their own and others' assumptions.

Several terms are often used interchangeably to refer to these groups which are bound together for the purpose of this type of interaction and knowledge building. These include *online learning communities, communities of practice* (Lave & Wenger, 1991), *communities*

of inquiry (Garrison et al., 1999), *virtual communities, wisdom communities* (Gunawardena et al., 2006), *bounded communities* (Wilson, Ludwig-Hardman, Thornam, & Dunlap, 2004), and even Nonaka et al.'s (2000) *ba*. Such communities consist of groups of individuals bound together for some reason, with the boundaries defined by the purpose of the group (Lee, Carter-Wells, Glaeser, Ivers, & Street, 2006). The common elements in these communities include a mutual interdependence among members, common expectations and goals for learning, a relationship of trust and support, a sense of belonging and connectedness, a sense of collaboration with the instructor in a collaborative yet facilitative role, the fostering of mindful reflection and critical thinking, and an active and reflective use of the knowledge. Involvement in such communities makes students feel more committed to learning and spending more time devoted to it (Lee et al.). Ultimately, the communities engage in a pursuit of what Mezirow (1991) calls *transformational learning*, a process by which critical reflection effects a change in one's habits of mind or point of view.

Community of Inquiry Framework

The CoI framework is grounded in the constructivist assumption that learners actively seek meaning and construct knowledge through critical analysis of subject matter, challenging their own and others' assumptions, and questioning information as they try to understand various experiences. The CoI framework contends that the online learning environment is conducive to meaningful critical thinking and higher level learning when there are sufficient degrees of three presences: social presence, teaching presence, and cognitive presence (Garrison et al., 1999). Social presence is the ability of students to engage affectively and socially in an online environment. A supportive environment is established where students

feel safe enough to establish personal and purposeful relationships, expressing their views and presenting themselves as "real people" (Garrison et al., p. 89). Teaching presence is described as the design, facilitation, and direction of social and cognitive processes used as members of the community construct knowledge. Cognitive presence, an essential element for success in higher education, is defined as "the exploration, construction, resolution and confirmation of understanding through collaboration and reflection in a community of inquiry" (Garrison, 2007, p. 65). It is important to note, however, that while the presences can be described individually the theoretical framework considers them to be interdependent. Each presence is distinct, but overlaps with the others in its contribution to the creation of a CoI.

Social Presence

Social presence refers to the ability of participants to project themselves socially and emotionally as "real people" in the CoI (Garrison et al., 1999, p. 89). Categories of social presence were termed *emotional expression, open communication,* and *group cohesion* (Garrison et al., p.89), but have also been named *affective, interactive, and cohesive* (Rourke, Anderson, Garrison, & Archer, 1999, p. 52). In emotional expression participants demonstrate the ability and confidence to express their feelings. Participants demonstrate open communication as they build and sustain relationships, demonstrate a willingness to interact, and show support, encouragement, and acceptance of others. Group cohesion involves activities which build and sustain a sense of commitment to the group, and includes communication that serves a purely social function.

Teaching Presence

Teaching presence was initially presented and has most often been measured as involving three critical roles: designing and organizing the learning environment and activities, facilitating discourse, and providing direct instruction (Anderson, Rourke, Garrison, & Archer, 2001). In design and organization, teachers construct the learning experience, make students aware of learning goals, guide them through the activities, and evaluate their resulting competence. In facilitating discourse, the teacher is an active member of the learning community who establishes and maintains the discourse. In direct instruction, teachers provide scholarly leadership and share subject matter expertise as they scaffold learning experiences.

The term "teaching" presence is used instead of the more specific "teacher" presence to acknowledge that in some cases the roles may be assumed by students contributing their knowledge and experiences, or by mentors or tutors. While the COI process model is a dynamic model with each presence impacting the others, the variable most directly under the control of the teacher is the creation and sustaining of teaching presence.

Cognitive Presence

Cognitive presence is grounded in Dewey's Pragmatic Theory of Inquiry (1938). This theory sees the student as an interactive being in contrast to the traditional view that the student is like a cup to be filled in the most efficient way possible. For Dewey, the educational experience includes reflection, inquiry, and problem solving which leads back to experience and practice. The Practical Inquiry (PI) model (Figure 2) constructed by Garrison

et al. (2000) reflects this process in four categories. The first is the initiation phase and is categorized as the *triggering event*. In this phase an issue, dilemma, or problem based on experience is presented. The second phase is *exploration* and reflects the inquisitive phase of practical inquiry. In this phase, the students move from their private, reflective world to the shared world as they grasp the nature of the problem and explore it further. In the third phase, *integration*, students construct meaning and generate a possible solution based on the ideas generated in the exploration phase. Students in this phase move between reflection on the problem and discourse. The final phase, commitment to a solution, is identified as *resolution* and involves testing hypotheses or implementing the proposed solution from the previous stages in a real setting. However, in the educational setting this may mean a "vicarious test using thought experiments" (Garrison et al., 2001, p.11) and consensus building.

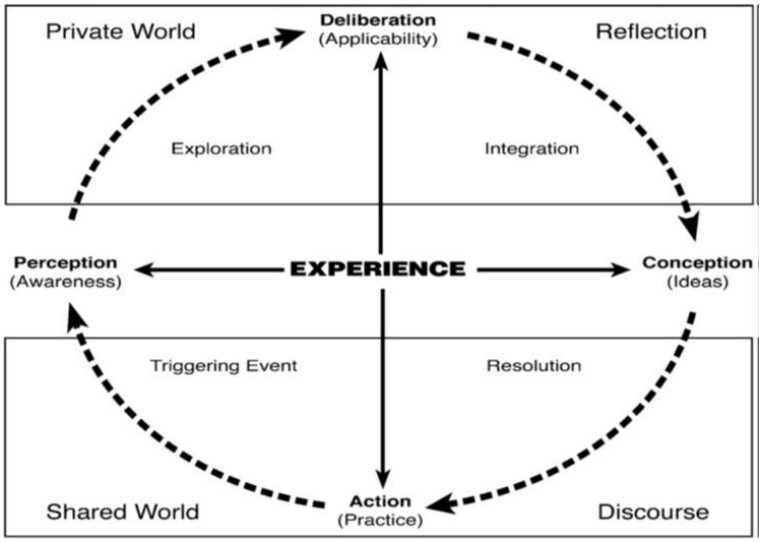

Figure 2. The Practical Inquiry (PI) model of cognitive presence (Garrison, Anderson, & Archer, 1999, p. 99).

Definitions

Cognitive presence: "The exploration, construction, resolution and confirmation of understanding" through course activities, discourse, collaboration and sustained reflection (Garrison, 2007, p. 65). It is represented by four categories: a triggering event, exploration, integration, and resolution.

Online course**:** A course that delivers 80% or more of the content online (Allen & Seaman, 2003; Bekele & Menchaca, 2008).

Online learning: Researchers consistently use this term to refer to instructional environments that use the Internet either partially or entirely to provide access to instructional materials and to facilitate interaction among participants (Means, Toyama, Murphy, Bakia, & Jones, 2010).

Social presence: The ability of participants to project themselves socially and emotionally as "real people" (Garrison et al., 1999, p. 89).

Teaching presence: The design, facilitation and direction of social and cognitive processes used as members of the community construct knowledge. In the present study, it includes both student and instructor contributions (hereafter referred to as "student teaching presence" and "instructor teaching presence"). Consistent with the original CoI framework (Garrison et al., 1999), it includes the roles of design and organization, facilitating discourse, and providing direct instruction.

Organization of the Study

Chapter 1 has presented the organization and background of the study. Chapter 2 summarizes the theoretical framework of the study as well as existing literature on learning

communities and specifically on online learning. Chapter 3 identifies the methods of data collection and analysis as well as a description of the setting and subjects. Chapter 4 describes the findings of the research. Finally, Chapter 5 addresses conclusions, implications for practice, and suggestions for future research.

CHAPTER 2

REVIEW OF THE LITERATURE

While research in online learning was once focused on examining its efficacy in comparison to face-to-face courses, attention has shifted to exploring how this medium can be utilized most effectively to attain learning outcomes. Specifically, much attention has been given to how the online forum can be used to lead students to higher-order thinking in the construction of knowledge. This chapter reviews theories of learning communities and models for understanding online learning. The framework serving as the basis for the present study, the Community of Inquiry (CoI) model, and the relationship of each of its components of social, teaching, and cognitive presence to both affective and cognitive outcomes are examined. Due to the complexity of measuring latent processes such as higher order thinking, prevalent models for cognition are also described.

Learning Communities

The interactional theories of Bruner (1966), Piaget (1964), and Vygotsky (1978) have shaped social constructivist theory and therefore the learning community model. Each emphasized that the development of an individual is integrally related to the social milieu in which it occurs. They argued against seeing individuals as "mere receptacles of facts, nor culture (as) a mere collection of unambiguous and immutable facts" (Takaya, 2008, p. 4). Instead, individuals construct the meanings in an ever-changing culture with education being

the mediating process between the individual and culture. Vygotsky understood this process as occurring in a gap between a child's actual developmental level when working independently and his/her potential development under the guidance of an adult or in collaboration with more capable peers. He called this the *zone of proximal development*. In this zone, the instructor or an advanced peer serves as a "scaffold" to support and guide the learners in the process of internalizing socially-mediated understanding to make it become personal knowledge. Piaget shared the belief that knowledge is a process of continuous self-construction. Piaget contended that cognitive development required an individual to experience cognitive conflicts, created by encountering either things in their environment or others with ideas differing from their own. Bruner contended that a model to guide the learner through a discovery process was an essential condition for learning.

Nonaka, Toyama, and Konno (2000) propose that in a world with rapidly changing markets, technologies, regulations, and societies, continuous innovation is essential for maintaining a competitive advantage. They propose that the process of creating new knowledge is a spiral consisting of three elements. The first is the SECI process where tacit and explicit knowledge are converted through the processes of *Socialization*, *Externalization*, *Combination*, and *Internalization*. The second element, *ba*, is the context where knowledge is created. This is described as a living place with fluid boundaries, changing as needs change (Nonaka et al.). Finally, knowledge assets are the resources used to create value for the organization. Like Bruner, Piaget, and Vygotsky, this model also emphasizes the importance of leadership. Especially crucial is the role of "knowledge producers" (p. 22), the middle managers who present the knowledge vision, develop and encourage the sharing of

knowledge assets, create and strengthen *ba* (the environment), and actively interact with others to create knowledge.

Another influential learning community model that was not limited to a classroom is the *communities of practice* model of Lave and Wenger (1991). A community of practice is any group of people in a shared domain of interest who engage in a collective learning process in a specific human endeavor. The members learn knowledge that is embedded in the community, therefore with the boundaries for learning firmly set (Lee, Carter-Wells, Glaeser, Ivers, & Street, 2006). With a strong emphasis on the social nature of learning, an essential element of this theory is the notion of *legitimate peripheral participation* (Lave & Wenger). This proposes that learners join a community and begin to learn at the periphery. As they gain competence, they move to become full participants. Unlike other models, learners do not depend on one individual for guidance or to scaffold their learning, but they learn from a community of practitioners. Further, this learning is *situated* in a real-life context.

Models of Online Learning

Anderson (2004) contends that there are two "competing" models of online learning today (p. 277). The first involves independent learners who work through the materials by themselves at their own pace. This *independent study* model affords students maximum flexibility, especially in terms of time and schedule, but limits the possibilities for collaborative learning activities. This type of learning relies largely on asynchronous written communication. The second and more widely-used model is that of a *learning community* that uses either synchronous communication, asynchronous communication, or a combination of both to create virtual classrooms as space for social learning or constructivism. A

common focus of these models is the creation of environments conducive to student engagement in higher order cognitive processes. Wallace (2003) contends that the shift in education to a focus on learning theories emphasizing construction of knowledge, the perception of technology as a tool for collaboration and communication, and the involvement in course design of educational researchers who support these theories has led to the current emphasis on online communities.

Many models have emerged as educators have sought to understand the dynamics of knowledge construction in an online environment. An important early model was Henri's (1992) content analysis model. Proposing that content analysis can aid in understanding the learning process and provide data to improve the efficacy of the online interactions, Henri proposed five dimensions of the learning process in a computer mediated conference (CMC). The first is a participative dimension which may be considered separately from the meaning-based dimensions (Gunawardena, Lowe, & Anderson, 1997). The other categories are social, interactive, cognitive, and metacognitive.

Using Henri's model as a foundation, but believing that it was too teacher-centered, Gunawardena et al. (1997) developed the Interaction Analysis Model (IAM). The co-construction of knowledge is compared to the creation of a quilt. The quilt block is built up by small pieces of fabric to form a bright, colorful pattern. The pieces are analogous to the contributions of individual participants. Interaction is defined as the process by which these pieces are fitted together. While it may not be completed during a single conference, the pattern which emerges at the end is the newly created knowledge or meaning. This model proposes five phases of knowledge construction: sharing or comparing of information, discovery of dissonance and inconsistency, negotiation of meaning and co-construction of

knowledge, testing and modification of the proposed synthesis, and agreement or application of the newly constructed meaning.

Grounded in part in community of practice theory (Lave & Wenger, 1991), the WisCom design model was developed by Gunawardena and colleagues (2006) to aid in design of online educational activities which facilitate transformational learning. This model proposes three essential dimensions for the online learning environment: a wisdom community, mentoring and learner support, and knowledge innovation. Emphasis is placed on creating a supportive environment, or wisdom community, where learners can "navigate the process of learning, collaborate, and become collectively wise" (p. 219). Development of this community is aided by the use of mentoring to support new members, guide learners through legitimate peripheral participation (Lave & Wenger) and to aid in the inclusion of diverse members. Finally, knowledge innovation occurs in four phases: creation of knowledge, recording the knowledge, accessing that stored or recorded knowledge and, most importantly, enabling learners to relate the knowledge to their individual and group learning goals. The design for the process of learning is intended to aid learners in discovering something, solving a problem, or working together to achieve a learning goal and consists of five steps. First, a *case study, problem, or issue* to be resolved is presented. Learners then share their understanding in *initial exploration*, followed by challenging and negotiating with peers in the *resources and perspectives* phase. Reflective thinking and internalization then occurs in the *reflection* stage. Finally, the group works together to produce shared artifacts that document the knowledge in the *preservation* phase.

Community of Inquiry Framework

Recognizing the proliferation of online courses and a lack of understanding of how to use this medium to facilitate learning, Garrison, Anderson, and Archer (1999) sought to create a framework that would allow them to investigate important educational issues related to online teaching and learning in the context of computer conferencing in higher education. Believing that e-learning would "transform teaching and learning" (Garrison & Anderson, 2003, p. xii), the CoI model was proposed as a conceptual framework to provide an understanding of a method for studying the potential of computer conferencing. The basic goal was to "define, describe and measure the elements of a collaborative and worthwhile educational experience" (Garrison, Anderson, & Archer, 2010, p. 6). Viewing promotion and cultivation of higher-order thinking skills as an essential element of higher education, the model emphasized the analysis of the features of written communication used in a computer conferencing context and the manner of facilitation that would promote higher levels of cognition. Since its introduction in 2000, CoI has arguably become the most widely studied model for understanding online learning.

The CoI framework (see Figure 1) was conceptualized based on an extensive review of the literature on computer conferencing, content analysis, linguistics, and communications and proposes that an online community is conducive to higher-order thinking and knowledge construction when there are sufficient levels of three presences: social presence, teaching presence, and cognitive presence (Garrison et al., 1999). Social presence is the ability of the participants to "project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (p. 89). While teaching presence is

likely to be the primary responsibility of the teacher, it can be exhibited by any participant and consists of designing the educational experience and facilitation as participants construct meaning. Teaching presence, the "binding element in creating a Community of Inquiry" (p. 96) supports and enhances both social presence and cognitive presence in the process of achieving educational outcomes. Cognitive presence, seen as the element most basic to success, is defined as "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (p. 89).

To further conceptualize the three presences, Garrison and colleagues (1999) examined transcripts of graduate level online conferences and developed a template for analyzing such conferences. The template consisted of categories of indicators of each of the presences. Social presence indicators were categorized into three groups: emotional expression, open communication, and group cohesion. Teaching presence also consisted of three groups of indicators: instructional management, building understanding, and direct instruction. Cognitive presence was depicted using the Practical Inquiry (PI) model, consisting of four phases: a triggering event, exploration, integration, and resolution. Coding schemes were developed for analyzing computer conferencing transcripts for indicators of social presence (Rourke, Anderson, Garrison, & Archer, 1999), teaching presence (Anderson, Rourke, Garrison, & Archer, 2001), and cognitive presence (Garrison, Anderson, & Archer, 2001). Each of these tools and the indicators will be discussed further in subsequent sections of this review.

Research into the CoI model has extensively focused on validating the framework. Recognizing the need for more quantitative approaches to the study of the CoI framework and

assessing the relationships of the three presences, a 44 item, 7-point Likert-type scale survey instrument was developed (Arbaugh, 2007). This instrument was designed to measure students' perceptions of the three presences and was developed by examining a variety of individual survey instruments already in use (e.g., Richardson & Swan, 2003; Shea, Fredericksen, Pickett, & Pelz, 2003). Using exploratory factor analysis to examine the responses of 667 MBA students, Arbaugh discovered a possible four factor solution: social presence, teaching presence, cognitive presence, and course design and organization. Since course design and organization is one of the categories of the teaching presence construct, it could be concluded that this fourth factor is a subfactor of teaching presence. Since the survey consisted of 20 teaching presence, eight social presence, and only four cognitive presence items, the division of teaching presence into two factors may have been the result of more specificity in the teaching presence construct. It may also be speculated that pre-course and in-course activities load on separate factors.

Subsequent studies made slight revisions to the survey and also found a potential fourth factor. Arbaugh and colleagues (2008) administered a 34-item survey to 287 students and found the items to load cleanly when specifying a three-factor solution with Direct Obliminal Rotation analysis. The factors accounted for 61.3% of the variance in scores, with the teaching presence factor accounting for 51.1% of the total variance. However, when conducting a Principal Components Analysis which did not specify a number of factors, a fourth factor emerged. This was seen again as a division of the construct of teaching presence into two factors: pre-course activities (design and organization) and in-course activities (facilitation and direct instruction). Diaz, Swan, Ice, and Kupczynski (2010) replicated these results in a study of an even mix of 412 graduate and undergraduate students. Items loaded

cleanly as expected when specifying three factors, but a fourth factor emerged when not specifying a number of factors. Again, examination of a scree plot showed the presence of this fourth factor to be inconclusive.

Studies that have analyzed the data using Direct Obliminal Rotation with three factors specified have consistently found the items to load cleanly across three factors (Garrison, Cleveland-Innes, & Fung, 2010; Swan et al., 2008). In a large-scale study of 2,159 subjects, Shea and Bidjerano (2009b) specified both three-factor and four-factor solutions and found that the three-factor solution fit the data best. This 34-item survey was developed in collaboration with researchers who had designed the previous scales and subscales and explained 63% of the variance with the three factors. After changing some of the items to more clearly reflect the teaching presence category of direct instruction, a 37 item survey was administered to 5,024 students (Shea & Bidjerano, 2009a). The data again loaded cleanly on three factors.

Whether the results suggested three factors or four, studies have consistently supported the notion that the presences are interdependent (Diaz et al., 2010; Maddrell, Morrison, & Watson, 2011). While survey instruments and specific indicators continue to be modified based on research findings, the central tenet that learning is situated in the interaction of all three presences remains unchanged.

Another area of study that has emerged is exploration of the relationships between demographic characteristics and the presences. In a study of 113,000 cases from an online university, Gibson, Ice, Mitchell, and Kupczynski (2012) found that Caucasian ethnicity, female gender, and traditional student status all had a significant relationship with each of the presences. For cognitive presence, black ethnicity also had a significant relationship.

However, the variance accounted for was small (r^2 range from .000 to .003) so the findings lacked relevance. Garrison, Cleveland-Innes, et al. (2010) also found no significant effect of gender on any of the presences.

Recent examination of literature on the CoI framework has focused on student satisfaction and perceived learning, but researchers have generally failed to connect CoI or any of its components (cognitive, social, or teaching presence) with measures of actual student achievement to support its central claim of promoting higher-order thinking and knowledge construction (Maddrell et al., 2011; Rourke & Kanuka, 2009; Xin, 2012). Responding to this call, some recent studies have examined relationships between the CoI framework and/or its components with achievement measures. Maddrell et al. found that while both the CoI composite score and each of its factors were significantly correlated with satisfaction and perceived learning, there was no relationship between the composite score and any instructor-assessed learning achievement measure. One instructor-assessed measure, the score on a final project, was significantly correlated to the cognitive presence subscale. However, the other two measures, the overall course score and the instructor's assessment of student performance based on the Structure of Observed Learning Outcomes (SOLO) taxonomy, showed no significant relationship, suggesting that student perceptions of the CoI and learning were more reflective of the students' attitudes toward the experience than actual achievement.

Social Presence

Social presence is the ability of the participants to identify with the community while projecting their individual personalities both purposefully and socially. It is related to the

concept of "immediacy" or behaviors that enhance closeness and interaction (Rourke et al., 1999). Many behaviors that enhance closeness, such as facial expression or eye contact, are not available in a computer mediated environment. However, the indicators of social presence are examples of ways participants still project themselves socially and emotionally in an online course. The three categories of indicators are affective expression, open communication, and group cohesion.

Affective indicators are those that show participants to have the ability and confidence to express their feelings. This includes conventional expressions of emotion as well as unconventional ones used to replace those that cannot be expressed online, such as using an emoticon in place of a wink or using repetitious punctuation. Other affective indicators include those that show humor, such as teasing or sarcasm, and those that demonstrate self-disclosure, such as presenting details of life outside of class or expressing vulnerability.

Open communication indicators are those that build and sustain relationships, demonstrate a willingness to interact and show support, encouragement, and acceptance of others. Examples include using the reply feature to continue a thread, quoting from others' messages, using a direct reference to the contents of another's posts, asking questions, complimenting or expressing appreciation and expressing agreement.

Activities that build and sustain a sense of commitment to the group are indicators of group cohesion and may be demonstrated by addressing or referring to another participant by name, referring to the group using inclusive pronouns, and use of phatics, salutations, or other communication that serves a purely social function. These include comments used to share feelings or establish a social mood, such as comments about one's health or the weather.

When the CoI framework was introduced, there was already a body of research examining the relationship between social presence and achievement. In a review of 29 studies on Internet supported learning, Wallace (2003) concluded that social presence is an important factor in both students' satisfaction and learning, although the ways in which social presence impacted learning were unclear. Research based in the CoI framework has offered mixed results. While some have concluded that there is a relationship between social presence and student-perceived learning (Richardson & Swan, 2003; Swan & Shih, 2005), others have not found such correlations (Lee et al., 2006). Some studies have concluded that it is difficult for critical discourse to develop without social presence, although it alone will not ensure such discourse (Garrison & Cleveland-Innes, 2005). Others propose that social presence serves as a mediating variable between teaching presence and cognitive presence (Garrison, Anderson, et al., 2010; Garrison, Cleveland-Innes et al., 2010; Shea & Bidjerano, 2009a). Examining specific indicators of social presence, Shea and Bidjerano (2009b) concluded that comfort in online discussions was the most significant item correlating to variance in levels of cognitive presence.

It is important to note that these studies have used subjective measures of learning, usually correlating social presence with what students *thought* they had learned. While some studies (e.g., Russo & Benson, 2005) have correlated social presence with objective measures of learning, such as quiz scores, these types of studies are limited.

Another important area of social presence research has focused on the instructor's role in establishing social presence. Lee et al. (2006) found that students perceived the instructor's presence in the discussion boards as critical to building community. While much of the literature places the main responsibility for establishing social presence on the instructor,

Aragon (2003) suggests that it begins with the instructional designer and is then shared by the instructor and the students.

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" (Anderson et al., 2001, p.5). Its central role in the CoI model is emphasized when it is described as "a means to an end – to support and enhance social and cognitive presence for the purpose of realizing educational outcomes" (Garrison et al., 1999, p. 90).

In a seminal work on the role of the teacher in the CoI context, Anderson et al. (2001) present a tool for assessing teaching presence. The construct is broken down into three critical roles: designing and organizing the learning environment and activities, facilitating discourse, and providing direct instruction. A research technique called content analysis was used to examine message units in two 13-week course transcripts and to create indicators of each of the three types of teaching presence. In design and organization, teachers design the learning experience, inform students of learning goals, guide them through the activities, and evaluate their competence. Indicators of design and organization include building curriculum materials or "re-purposing" existing materials for use online, designing an appropriate mix of individual and group activities, establishing time parameters for course process, and providing guidelines and tips both for netiquette and effective use of the course platform. In facilitating discourse, the teacher is an active member of the learning community who establishes and maintains the discourse. This element of teaching presence is "crucial" with regard to

successful higher-order learning (Garrison & Cleveland-Innes, 2005, p. 136). Anderson et al. note that indicators of facilitating discourse include identifying areas of agreement or disagreement; seeking to reach consensus or understanding; encouraging, acknowledging, or reinforcing student contributions; setting the climate for learning; drawing in participants, prompting discussion; and assessing the efficacy of the process. In direct instruction, teachers provide scholarly leadership and share subject matter expertise as they scaffold learning experiences. Indicators of direct instruction include presenting content and questions, focusing the discussion on specific issues, summarizing the discussion, confirming understanding through assessment and explanatory feedback, diagnosing misconceptions, injecting knowledge from diverse sources, and responding to technical concerns.

Using this framework, Anderson et al. (2001) analyzed the instructor posts in the two 13-week courses. The analysis indicated that in both classes the majority of the instructor interaction was in direct instruction (77% of the instructor message units in one course and 87.5% in the other) and the least in design and organization (22.3% in one course and 37.5% in the other). The less frequent use of design and organization messages does not indicate that this is a role in which instructors are less engaged, but that some of this role has occurred prior to the discussion forum, the data source for the study (Anderson et al.).

A significant area of attention for recent research in teaching presence has been empirical verification of the three categories of design and organization, facilitation of discourse, and direct instruction. Shea, Li, Swan, and Pickett (2005) concluded that a two category model was more accurate: design and organization and "directed facilitation" (p. 66). This conclusion has been supported in subsequent studies (Shea, Li, & Pickett, 2006). One possible explanation for the amalgamation of facilitation and direct instruction is that these

studies included the perceptions of primarily undergraduate students who may not distinguish between these two indicators (Garrison, 2007).

Others have proposed a four-category model of teaching presence. In an examination of student perceptions expressed in survey responses by 667 graduate students, Arbaugh (2007) found that "course design and organization" could be a distinct construct from teaching presence. Using exploratory factor analysis, four of the six items originally developed to measure design and organization in teaching presence loaded at .59 or higher on this factor, although three of those four also loaded at .49 or higher on the teaching presence factor. A possible explanation for this is that the roles may be separated as pre-course (i.e., design and organization) and during course activities (i.e., facilitating discourse and direct instruction). Arbaugh et al. (2008) supported this conclusion and suggested that the teaching presence items may need to be refined as vague wording may result in discrepancies in the factoring.

It is interesting to note that the two factor construct is analogous with the description of teaching presence in the initial presentation of the CoI model as consisting "of two general functions . . . the design of the educational experience . . . (and) facilitation" (Garrison et al., 1999, pp. 89-90). In describing indicators, however, three categories were delineated: instructional management, building understanding, and direct instruction. The first two labels were subsequently changed to "design and organization" (Anderson et al., 2001, p. 5) and "facilitating discourse" (p. 7), respectively.

In spite of the inconsistent articulation of the roles within teaching presence, the principal finding of the CoI research to date has been the preeminent importance of teaching presence as a whole. As such, recent research has begun to examine this construct to gain a

better understanding of teaching presence and to explore its relationship to social and cognitive presence. Garrison, Cleveland-Innes, et al. (2010) assert that student perceptions of teaching presence directly influence their perceptions of cognitive presence and social presence. This supports the earlier conclusion by Garrison and Cleveland-Innes (2005) that teaching presence is a crucial element in students transitioning from social presence to cognitive presence. Even in students who report low social presence and would be likely to also have low cognitive presence, teaching presence can play a moderating role (Shea & Bidjerano, 2009a). With this pivotal role, and as the construct most directly under the control of the teacher, its examination is important for our understanding of effective online pedagogy.

Relationship to Affective Outcomes

Russo and Benson (2005) propose that affective learning (defined as the attitudes students develop about the course, other students, and the instructor) is an important indicator of overall success in online courses. Extensive research examines the role of the instructor in affective learning. Garrison and Arbaugh (2007) suggest that teaching presence is a "significant determinate" (p. 163) of affective outcomes such as student satisfaction, sense of community, and perceived learning. Strong correlations have been found between student satisfaction and high levels of both student-faculty and student-student interactions (Shea, Frederickson, et al., 2003; Shea, Pickett, & Pelz, 2003; Swan, 2001). Studies examining the strength of correlation between attitudes or satisfaction and student teaching presence compared to the strength of correlation between and attitudes or satisfaction with instructor teaching presence have had mixed results. Russo and Benson found that both student

teaching presence and instructor teaching presence were significantly positively correlated with favorable attitudes and satisfaction with the course, but perceptions of student teaching presence were more highly correlated. In contrast, Shea, Pickett, et al. (2003) determined that student perceptions of strong instructor teaching presence correlated more highly with both satisfaction and perceived learning than did perceptions of student teaching presence.

Garrison et al. (2010) found students' perceptions of teaching presence to also be significantly associated with social presence. Lee et al. (2006) supported this conclusion in a study of 18 master's level cohort students, finding that 87% of the students believed that the instructor-to-student interactions were critical to building community. Shea and Bidjerano (2009b) found a causal relationship, with the establishment of social presence being contingent upon the establishment of teaching presence.

Recent evidence has also shown student perceptions of teaching presence to have a direct predictive effect on perceptions of cognitive presence (Garrison, Cleveland-Innes, et al., 2010; Shea & Bidjerano, 2009b). For example, in a survey of 2159 online learners, Shea and Bidjerano found that 70% of the variation in students' levels of cognitive presence could be modeled based on their reports of their instructors' skills in fostering teaching and social presence.

Shea et al. (2003) developed a survey to determine students' perceptions of teaching presence using the indicators of each of the three roles proposed by Anderson et al. (2001) as a guide. Shea and colleagues surveyed 6088 students in online courses at the State University of New York (SUNY) Learning Network with 31% response rate. Students who reported perceptions of high levels of instructional design and organization also tended to report high levels of satisfaction (r = .64) and learning (r = .60). A positive correlation was also found

between students who perceived effective discourse facilitation on the part of the instructor and their satisfaction with the course (r =.64) as well as their perceived learning (r = .58). While students rated their peers almost as high as the instructor on discourse facilitation, the peer involvement had a lower correlation to both satisfaction (r = .41) and reported learning (r = .43). Finally, students who perceived effective direct instruction also reported high levels of satisfaction (r =.63) and learning (r =.61). While this study did not find any significant difference in correlations between specific roles and student satisfaction or perceived learning, studies using the two role model (Shea et al., 2005; Shea et al., 2006) concluded that directed facilitation (i.e., an amalgamation of facilitating discourse and direct instruction) was more influential than design and organization in contributing to students' satisfaction and perceived learning.

Relationship to Measures of Achievement

While research has connected teaching presence to perceived learning or students' expected grades (Kupczynski, Ice, Wiesenmayer, & McCluskey, 2010), only recently has more attention been focused on examining the impact variations in one or more of the teacher roles (i.e., design and organization, facilitating discourse, and direct instruction) has on measurable constructs of higher-order cognitive functioning. A primary focus of this research has been on examining the utility of various course designs, discussion strategies, or new technologies for facilitating higher order learning (Darabi, Arrastia, Nelson, Cornille, & Liang, 2011; Dringus, Snyder, & Terrell, 2010; Kanuka, 2005; Kanuka, Rourke, & Laflamme, 2007; Richardson & Ice, 2010; Rourke & Kanuka, 2009; Rovai, 2007; Vaughan, 2010). Particularly as new technologies are developed, there is mounting evidence that the role of

instructors (or instructional designers) prior to the start of the course can impact higher order thinking.

In a study of 19 non-traditional undergraduate students enrolled in an online Bachelor of Education program, Kanuka (2005) examined six online instructional strategies for their impact on higher level learning. Using a rubric based on the SOLO taxonomy, levels of sophistication in responses for academic tasks were evaluated for a variety of instructional strategies. Not surprisingly, the results showed that certain instructional strategies were more effective than others in facilitating higher order cognition. WebQuests seemed the most effective, with 17 of the 19 participants reaching the relational or extended abstract levels. Brainstorming, using the synchronous chat feature of WebCT, prompted 11 of the participants to reach these levels. The nominal group technique, which guides students to discuss differing views on a well-formed problem, facilitated only seven students to reach these levels. The less effective techniques examined were debate and inviting an expert to join the group discussion. Conclusions about these results should be generalized with caution, but they do suggest that the teaching presence role of design and organization can play an important role in facilitating higher order cognition.

Course designs have also been evaluated in light of interaction levels of participants. Although interaction is seen as central to online learning, interaction by itself may not lead to a process of inquiry (Garrison & Cleveland-Innes, 2005). In a study of 75 graduate students in four different courses, Garrison and Cleveland-Innes administered a Study Process Questionnaire to assess the learning strategies they chose in response to various settings. Four treatment groups were used, with one requiring students to critically analyze readings in small groups, another to respond to text "lectures" with limited instructor involvement, a third with

extensive instructor presence but voluntary participation for the students, and the fourth with high levels of instructor engagement both in and outside of the conference with assignments which required direction and thought. Results indicated that the design strongly influenced the students' approach to study, with the latter design facilitating deep learning. Although the third course had high instructor engagement, the design did not require deep cognition. Garrison and Cleveland-Innes concluded that while social interaction may create the condition for critical discourse, "it does not directly create cognitive presence or facilitate a deep learning approach" (p. 143). This would support Kanuka's (2005) finding that some designs lead to higher levels of learning than others.

While these and other studies support the conclusion that "the quality of instructional design creates conditions that can facilitate effective learning environments" (Kanuka, 2005, Background section, para. 3), there is also mounting evidence that the other teaching presence roles have as much influence or even more than design and organization in promoting sense of community and higher-order cognition. For example, Shea et al. (2006) conducted a multi-institutional study of more than 1,000 students and concluded that "directed facilitation" on the part of the instructor contributed more to students' sense of classroom community and learning than design and organization. Supporting this finding, Shea and Bidjerano (2009b) found that students who agreed more strongly with the teaching presence indicator "The instructor helped focus discussions on relevant issues that helped me to learn" had higher cognitive presence scores. Effective facilitation of discussions is crucial for students' perception of learning.

Teacher Immediacy

Related closely to the construct of teaching presence is the concept of teacher immediacy. Both ideas focus on the perceived importance of the individual in the interaction, but teacher immediacy refers specifically to those behaviors of the teacher that enhance the nonverbal interactions and feelings of closeness with one another (Wallace, 2003). These behaviors can be related to the indicators found in face-to-face classrooms and include behaviors that indicate approval, provide status recognition, demonstrate social interest or enhance the status of the other individual (Wallace). This process of enhancing closeness is more difficult to do without the non-verbal cues in a face-to-face environment, but behaviors such as calling someone by name, providing praise, and using humor can demonstrate teacher immediacy even in an online discussion environment where video interaction is not utilized. While these behaviors may be a part of the teacher's role in interactions that address the components of teacher presence (design and organization of the course, facilitating discourse or providing direct instruction), they also provide an overlap with the concepts of social presence and cognitive presence. Teacher immediacy is a mediating factor in motivation, which in turn mediates both social and cognitive learning (Russo & Benson, 2005; Wallace).

Higher Order Thinking

Many theories have been posited to describe the cognitive processes in which students engage. One of the most widely used taxonomies of levels of cognitive outcomes is that of Benjamin Bloom (1956). He posited five levels of cognitive functions, which become increasingly complex as learners progress. The first, *knowledge*, included simply

remembering learned material, such as facts, vocabulary or principles. The next levels were *comprehension* of the material and *application* of the rules or ideas to concrete situations. Fourth was *analyzing* the material into its essential parts. This was followed by *synthesis* where the student combines several parts or ideas to form something new. Finally, the student engages in *evaluation* where judgments are made about the material according to some criteria. In the 1990's a former student of Bloom's, Lorin Anderson, convened a group for the purpose of revising the taxonomy to increase its relevance for 21st century teachers and learners (Anderson & Krathwohl, 2001). The new taxonomy proposed six levels: *remembering* (retrieving, recognizing, and recalling knowledge), *understanding* (constructing meaning from the information presented), *applying* (carrying out a procedure or implementing), *analyzing* (breaking material down into parts and determining how those parts relate to each other), *evaluating* (making judgments based on certain criteria or standards), and *creating* (reorganizing the elements or putting them together to form a new structure).

A widely used model which corresponds to Bloom's taxonomy at the higher levels is Henri's (1992) Cognitive Framework. In this model a hierarchy is proposed beginning with *elementary clarification* where the relevant elements and hypotheses are identified. This is followed by *in-depth clarification* which identifies assumptions and seeks out more specialized information. The third level is *inference*, where conclusions are drawn and generalizations made. *Judgment*, including making value judgments, of the relevance of solutions and the inferences then occurs. Finally, *strategies* are drawn, with decisions made on the action or solution to be taken.

Another recent taxonomy of levels of thinking and learning was posited by J.B. Biggs (1979). This approach included three levels of learning: *utilizing*, *internalizing*, and

achieving, but was subsequently revised to the terms: *surface, deep,* and *achieving*. In the surface approach, the student's purpose is to meet the requirements to reproduce information with the least effort. At this level, the student focuses on the surface elements and not on any connections or meanings. At the next level, deep learning, the student is intrinsically motivated to understand the content. The student relates information to prior knowledge, poses theories or hypotheses, and poses both exceptions and extensions to the information. Finally, the achieving student is motivated by competition and a focus on the external reward for achievement. This student exhibits behaviors that maximize time and effort, such as organizational skills, time management, and prioritizing tasks. Since this latter approach addresses achievement more than cognitive processes, the literature on learning communities often discusses only surface and deep learning, leaving out the achieving level. In a later taxonomy, Biggs (1979) proposed five levels of sophistication that can be seen in learners' responses:

1. *Prestructural* – the student demonstrates little or no understanding
2. *Unistructural* – one or a few concepts are described or understood, but not linked to others
3. *Multi-structural* – the student uses multiple pieces of data but fails to link them
4. *Relational* – the student integrates concepts and explores relationships among them in a meaningful way
5. *Extended abstract* – the student posits possible explanations, theories, or hypotheses; the understanding results in generalization, transfer or other metacognitive skills

Nonaka et al. (2000) distinguished two types of knowledge: the *explicit knowledge* expressed in formal language and the knowledge that is hard to formalize, such as insights or intuition referred to as *tacit knowledge*. The process of converting knowledge between the two types occurs in the SECI process: *Socialization* where new tacit knowledge is developed through shared experiences, *Externalization* where tacit knowledge is articulated into explicit knowledge and shared with others, *Combination* where sets of explicit knowledge are combined to create other explicit knowledge, and *Internalization* where explicit knowledge becomes a part of an individual's tacit knowledge. This process is highly interactive and occurs as one reaches outside of personal experiences in involvement with others and their environment. Knowledge assets are the shared tacit knowledge created through interaction between individuals.

Gunawardena et al.'s (1997) Interaction Analysis Model (IAM) was also designed to assess knowledge construction in an online environment. This model consists of five phases: sharing or comparing of information, discovery and exploring dissonance or inconsistencies, negotiation of meaning, testing and modifying the proposed synthesis of information, and agreement statements or application of the new meaning. Yang, Richardson, French, and Lehman (2011) suggest that this model is a social interaction model which does not address student-to-content interaction. They further speculate that it may have more indicators of lower levels of cognitive skills because it represents students' initial understandings of the content.

Cognitive Presence

Perhaps the most prevalent contemporary model for understanding higher order thinking in an online environment is Garrison et al.'s (1999) model of cognitive presence. Cognitive presence is defined as the extent to which learners are able to construct meaning through the discourse and reflection in a CoI. When students explore material, construct meaning, resolve differences in interpretations and confirm understanding, they are exhibiting cognitive presence. This construct is illustrated through the PI model (see Figure 2), consisting of two axes: action-deliberation and perception-conception. The first axis is a reflection on practice and the second is assimilation of information and knowledge construction. The quadrants created when they intersect represent the sequence of practical inquiry, consisting of four phases: triggering event, exploration, integration, and resolution. Using content analysis, Garrison et al. (2001) developed a set of indicators to further describe each phase.

The first phase, the *triggering event*, is the presentation of an issue, dilemma, or problem, and causes a state of dissonance (Garrison et al., 2001). In the context of an online course the teacher plays a critical role in initiating and shaping the triggering event. While this is often done in the teacher's role of design and organization, the role shifts to facilitating discussion when a potentially distracting triggering event is presented by others and must be redirected. Indicators of this phase include statements that recognize the problem or display a sense of puzzlement.

The second phase, *exploration*, requires students to grasp the nature of the problem and more fully explore relevant information (Garrison et al., 2001). The participants shift

between their private reflection and the social exploration of the ideas. Statements that demonstrate divergence, either within the online community or within a single message, are indicators of this phase. Exchanging information, presenting ideas for consideration, brainstorming, and even offering an unsupported conclusion also indicate exploration.

The ideas that have been generated are integrated and transformed into meaning in the third phase, *integration* (Garrison et al., 2001). Students continue to move between personal reflection and group discourse as they look for insights and begin to gain understanding. This is evidenced by connecting or synthesizing ideas, agreeing with or building on a previous message of another group member, creating solutions, and justifying tentative hypotheses. Here, teaching presence in facilitating discussion and direct instruction is crucial as the teacher diagnoses misconceptions, provides accurate and additional information, asks questions, and models the critical thinking process.

The fourth phase is the *resolution* of the issue or problem (Garrison et al., 2001). It is in this phase that an idea or hypothesis is tested. Indicators of this phase include making real world applications as well as testing and defending solutions. In contrast to a situated learning environment where students try out their solutions, in an online setting the resolution phase may involve simply vicarious application and testing of solutions.

Relationship to Affective Outcomes

Since the central claim of the CoI framework is that it leads to higher order learning, one would expect a plethora of studies measuring cognitive presence. However, Rourke and Kanuka (2009) found that of 252 reports referencing the CoI framework from 2000-2008, only 48 collected and analyzed data on one or more aspects of the framework and only seven

included a measure of student learning. Of these, five used *perceived* learning as the measure of learning. Some research brings into question whether this is a valid measure because self-reported data for perceived achievement may be impacted by positive bias and may not have a positive correlation with actual points earned in a course (Guri-Rosenblit & Gros, 2011; Lee et al., 2006). Conversely, Akyol and Garrison (2011b) found that students in both an online and a blended course had a high perception of learning and their course grades were also high. It should be noted, however, that these studies used a small sample size and should be generalized with caution.

Relationship to Measures of Achievement

Some research has employed a more objective measure of learning by using content analysis to examine online contributions (Akyol & Garrison, 2011b; Garrison et al., 2001; McLoughlin & Mynard, 2009). Garrison et al.'s template was initially tested on three one-week exchanges from two computer-conference courses. Both were graduate level courses, with a total enrollment of 24. Demonstrating the complexity of measuring latent higher order thinking, the researchers had difficulty reaching an acceptable level of inter-rater reliability, reaching a high of $\kappa = .74$ after three training sessions. Discrepancies occurred in each of the categories, but the main source of disagreement was between exploration and integration. Since a central criticism of the framework is that students do not move to the higher levels (i.e., integration and resolution), it is important to note the problem encountered in categorizing such responses. As one might expect, only 8% of the messages were in the triggering event phase. This is likely because the problem or issue was framed by the teacher in the role of design and organization. The exploration phase had the highest frequency with

42% of the responses. The higher level processes of integration and resolution were much less apparent, with 13% and 4% of the responses, respectively.

A central criticism of the CoI framework has been the lack of evidence that it leads to the higher order thinking it claims to stimulate. Studies have consistently found that students fail to move beyond the exploration stage, not proceeding to the higher stages of integration and resolution (Garrison & Arbaugh, 2007). In a study of 19 undergraduate students' contributions to an online discussion, Kanuka et al. (2007) found that the highest percentage of messages (53.32%) were in the exploration phase, with only 9.79% reaching resolution. Likewise, Meyer (2003) examined graduate student postings and categorized 51% in exploration, 22% in integration, and only 7% in resolution. In a review of seven studies that analyzed transcripts of online discussions, Rourke and Kanuka (2009) concluded that the majority of messages in online discussions are in the exploration phase (range 41-63%, M = 50.14) and the fewest are in the resolution phase (range 1-10%, M = 5).

Some researchers have begun to examine factors that may impact students' progression to higher levels of thinking. Akyol, Garrison, and Ozden (2009) compared course formats, finding the frequency of messages in the integration phase to be significantly higher in a blended course than a fully online course, whereas the exploration phase was significantly higher online. These findings would support those of Kanuka and Anderson's (1998) analysis of online discussions using Gunawardena et al.'s (1997) IAM, with most contributions to the online discussion fitting the lower levels of cognition.

Others have examined the role of time in reaching higher levels of cognitive presence. In an analysis of three 3-week segments of a nine-week graduate level course, Akyol and Garrison (2008) found that while the phases of cognitive presence differed significantly from

each other, the proportions remained steady over time. In contrast, Akyol, Vaughan and Garrison (2011) found that a longer course (i.e., eight-week) had significantly more messages at the integration and resolution phase than a shorter course (i.e., four-week) that was identical in content and with the same instructor.

The level of degree, academic discipline, and age of students have also been considered as possible factors influencing demonstration of higher levels of thinking. Meyer (2004) examined 17 discussions of two doctoral-level educational leadership classes and found that the majority of the postings fit the higher levels of cognitive presence. Specifically, 18.3% of the posts were in the triggering event phase, 27% in the exploration phase, 32.4% integration, and 19.8% resolution. While one would expect that doctoral-level students might reach these higher levels, it should also be noted that this study utilized only one researcher and therefore had no inter-rater reliability. Garrison, Cleveland-Innes, et al. (2010) also found a significant relationship between academic discipline and cognitive presence. Although these data were perceived as performance, based on the CoI survey, programs with courses in the humanities and social sciences had a significant effect on perceptions of cognitive presence. It is important to note that these courses often require more debate, critique, and other activities that correlate with indicators in the integration and resolution stages. Another example of demographic influence is a study conducted by Shea and Bidjerano (2009a). Using cluster analysis of the results of a CoI survey administered to 5,000 students, a significant relationship was found between age and levels of cognitive presence, with older students reporting higher levels. Contrary to the studies described above that utilized content analysis, the majority of students reported meeting the highest level of cognitive presence, with only 6% disagreeing with statements on indicators for resolution.

Social presence indicators have also been linked to perceptions of high levels of cognitive presence. Shea and Bidjerano (2009b) found that the social presence indicator "I felt comfortable participating in the course discussions" to be the highest level item sorting respondents on the cognitive presence factor. That is, those who agreed most strongly with this statement had higher levels of perceived cognitive presence than those who were neutral or disagreed with the statement. Another important indicator was "Getting to know other course participants gave me a sense of belonging in the course." Students agreeing most strongly with this statement had higher cognitive presence perception scores.

While evidence exists that the format or length of the course, the type of program, demographic factors, and even social presence may influence the levels of cognitive presence reached by students, perhaps the factor receiving the most attention for influence is the teacher. In a reflection on the first decade of the CoI framework, Garrison, Anderson, et al. (2010) contend that while early studies found students not moving to the higher phases, "teaching presence in the form of designing learning activities that will require solutions and that provide facilitation and direction will ensure students move through the phases of the PI model in a timely manner" (p. 7).

Connection to the Current Research

Early CoI research often focused on creation and validation of coding schemes for content analysis, often isolating one or more of the presences. More recent research has focused on validating the model through student perception surveys. Although the CoI framework is widely accepted as useful for facilitating higher order thinking in the online learning environment, the research does not reflect a clear consensus on whether students

reach these levels. While teaching presence has been singled out as a central component of the model, a deeper understanding of the roles within teaching presence and their relationship to students' engagement in higher order cognitive processes is necessary if online instructors are to be guided in effective pedagogy. Building on previous research, the present study utilized a comparative case study approach with both content analysis and student and instructor perceptions to examine the interrelationships of the teaching and cognitive presence in a graduate online forum. This study sought to extend the data by examining course products of the students for further evidence of levels of cognitive presence.

CHAPTER 3

METHODOLOGY

The purpose of this case study was to examine the dynamics of two online class sections of a graduate course in education at a small, private university in the Midwest as they relate to students' engagement in higher order thinking processes. This chapter articulates the design of the research as well as the research questions. The context of the study is described, including the participant selection process. Data sources are identified along with the methods utilized for data collection, instrument detail, and analysis procedures. Finally, methods employed for establishing the trustworthiness of the data and ethical considerations are discussed.

Research Design

A comparative case study design (using two cases) was employed for this research. A case study design is useful for gaining insight into, discovering, and interpreting complex social phenomena (Merriam, 2001). It is especially advantageous when "the boundaries between phenomenon and context are not clearly evident" (Yin, 1994, p. 13). Garrison, Anderson, Archer (2001) allude to a blurring of boundaries between the phenomenon and context when they note that "critical thinking is both a process and an outcome" (p. 8). The process of participants exhibiting high levels of cognitive (and social and teaching) presence leads to the outcome of higher order thinking. Because a case study design is particularly useful for

examining how and why events occur within a real-world context (Yin, 2014), it is helpful in providing a rich description of the context in which the process of higher order thinking occurs. A case study is also helpful due to the complexity of the construct of higher order thinking and the difficulty in measuring it.

Case studies benefit from prior development of theoretical frameworks to guide data collection and analysis but are also advantageous when the researcher's goal is to expand and generalize the theory (Yin, 1994). The research may confirm what is known or generate new meaning. While case studies are not restricted to qualitative methods, one that utilizes qualitative data supports Creswell's (2008) suggestion that a qualitative approach should be used if there is "a notion that the available theory may be inaccurate, inappropriate, incorrect, or biased" (p. 99). As seen in Chapter 2, research has largely failed to validate the Community of Inquiry (CoI) theory. Early qualitative research, using primarily content analysis methods, showed that students in a CoI tended to stall at the exploration stage (Garrison & Arbaugh, 2007), therefore not supporting the theory's basic premise. Further, much of this research had shortcomings such as a failure to report reliability data involving inter-rater independent judgments (Garrison, Anderson, & Archer 2010; Rourke, Anderson, Garrison, & Archer, 2001); objectivity, replicability of coding schemes, and systematic coherence (Rourke et al.); validity (Rourke & Anderson, 2004); and epistemological challenges (Garrison et al.). In contrast to earlier studies using content analysis, the plethora of more recent quantitative research has generally concluded that students do achieve high levels of cognitive presence, although it has been criticized because the connections that are made solely compare student reported levels of the presences rather than content-based assessment of them (Maddrell, Morrison, & Watson, 2011; Rourke & Kanuka, 2009; Xin,

2012). However, many of these quantitative survey-based studies (Arbaugh, 2007; Arbaugh et al., 2008; Diaz, Swan, Ice & Kupczynski, 2010; Shea, Li, & Pickett, 2006) have also raised further questions about the CoI framework itself, in particular the factors that make up the teaching presence construct. The contrasting findings of studies that analyzed course transcripts and those that utilized student reported measures, along with the divergent conceptualizations of the teaching presence construct, indicate that the CoI framework warrants further examination. In the present study, the rich descriptive data a case study affords provided insight into the dynamics within a CoI and its desired outcome, higher order thinking. Insights gained from this examination of particular cases may then be generalized to the broader theory (Yin, 1994).

Research Questions

This study examined the following research questions:

1. What patterns of teaching presence and cognitive presence develop in an online course?
    a. What patterns of student teaching presence develop in the discussion forum?
    b. What patterns of instructor teaching presence develop in the discussion forum?
    c. What patterns of instructor teaching presence as demonstrated by multiple data sources develop in the course?
    d. What patterns of student cognitive presence develop in the discussion forum?
2. What is the relationship between teaching presence and content-based cognitive presence?

   a. What is the relationship between student teaching presence and content-based cognitive presence in the discussion forum?
   b. What is the relationship between instructor teaching presence and student content-based cognitive presence in the discussion forum?
   c. What is the relationship between instructor teaching presence as demonstrated by multiple data sources and student content-based cognitive presence in the final projects?
3. What is the relationship between student-reported cognitive presence and content-based cognitive presence?
   a. What is the relationship between student-reported cognitive presence and content-based cognitive presence in the discussion forum?
   b. What is the relationship between student-reported cognitive presence and content-based cognitive presence in the final projects?

Researcher's Role

The researcher served as an observer of the classes and did not have any active role. Unlike a researcher in a face-to-face class, the researcher observed these online class sections without ever entering the classroom. In part due to Institutional Review Board (IRB) restrictions, content produced in the active class sections had to be provided to the researcher by the university's course management system administrator. Additionally, only information from those students who consented to participate was provided. The class sections were also observed through analysis of instructional materials and a student project, all provided to the

researcher by the participants. End-of-course interviews with the instructors were conducted in person upon completion of the course.

While the researcher had previously met one of the instructors, they were generally unknown to her. Although the researcher and instructors all taught at the same institution, they were housed in different colleges. Likewise, because the researcher teaches primarily at the undergraduate level and the course was at the graduate level, the students were also unknown to the researcher.

Site and Sample Selection

A case study requires two levels of sampling: the "case" to be studied and the participants within the case (Merriam, 2001, p. 65). In the present study, a case consisted of a single class section. To identify the particular cases for study, a purposeful criterion based sampling procedure was used (Patton, 1990). The researcher sought class sections that met the following primary criteria: 1) the section was offered as multiple sections of the same course, 2) class section was offered fully online, 3) the class section was a course offered at the undergraduate level, and 4) at least two different instructors were teaching the class sections. To solicit class sections, the researcher examined the schedule of course offerings for two different semesters at ten different institutions. Four institutions had class sections that met the initial criteria, and the gatekeepers were approached to gain access to the class sections. Initially an email was sent to the department chair where the course was housed (except at one institution where contact information was not available and the Dean of online programs was approached). A second email was sent to those who did not respond, followed by a telephone call. Those administrators who had responded indicating interest in the

research were also telephoned. This resulted in telephone conversations with five different administrators to determine if the class sections met the remaining secondary criteria: 1) instructors were teaching from the same course template (i.e., the same initial design and organization for the class sections) and 2) the class section had weekly discussions and a final project as part of the design. The researcher also noted a preference for class sections with 1) a course template that had been used during at least one previous semester and 2) at least 10-15 students enrolled in each class section. Although one course with four sections met all of the criteria, permission was not granted at the institutional level to use the course content for this research.

The researcher then revised the initial primary selection criteria to include graduate level courses and examined the courses offered at the institution at which she worked. This resulted in 32 potential courses ranging from two to nine sections each. Four department chairs were contacted to determine which class sections met the secondary set of criteria and which had the preferred characteristics. The chairs were also asked for permission to use the courses and to contact the instructors. Again, questions emerged from the gatekeepers about granting access to the courses, especially due to intellectual property and confidentiality concerns. Of particular concern was protection of the identity of the instructors, because the report of findings could add another "layer of evaluation" that is not expected of other instructors. After the proposed methods of data collection were further clarified, approval was granted by both administrators and the IRB. Three courses remained (ranging from two to five sections each) from which possible cases could be drawn, having met the primary, secondary and preferred criteria (although enrollment numbers were not certain).

Instructors were then approached for their willingness to participate both through a telephone call and through email (Appendix A). Two of the courses were more thematic and discussion-focused than the other course that focused more on performance and practice. The selected course, with two sections, was chosen because of the discussion focus and as a matter of convenience since both instructors agreed to participate and provided informed consent (Appendix B) prior to the start of the course.

Setting

The course, a graduate level course in education, was a requirement in three different master's degree programs offered at the university, and was a requirement for a state licensure endorsement. The programs were marketed as being focused on developing teachers as leaders with the skills to envisage and enact changes in education while also offering a balance between addressing the practical everyday needs of teachers and developing the critical thinking and decision-making skills necessary for educational leaders.

The course was designed to develop broad understandings about learners in bilingual education and to examine the impact of particular issues on classroom practices. There were no prerequisites for the course, and all students had graduate standing. All activities in the selected class sections were online in an 8-week format with no face-to-face component. Students were expected to complete assignments using the Internet and library databases and to interact with their instructor and peers through Blackboard, the university's course management system. All instructional materials were accessed online, and all participation (including assignment submission) occurred online.

Both sections of the course were taught from the same template, therefore having the same syllabus, discussion prompts, instructional materials, assignments, and grading rubrics. Further, the course had been taught in this format multiple times. The course had a required textbook as well as articles from scholarly journals, provided to the students electronically through the course template. The materials and activities were organized into "modules" with students completing one module per week. In the first week students completed Module 1, which required them to write a 500-word introduction that included personal information as well as a reflection on their personal goals, motivations, and development as a language learner. Each of the remaining seven modules in the course addressed a different topic. In each module the students had assigned readings, from both the text and article(s), and were required to post a response of 250 words or more to the readings by Monday morning. By Friday the students were to respond to at least two peers in 100 words or more. Three additional assignments were required: 1) viewing an online video and writing a response paper, 2) writing a critique of their school district's policy and programs based on the readings and class discussions, and 3) developing their own philosophy and vision for an "ideal" program in the field. Each of these assignments and class activities is further described in Chapter 4.

Study Participants

The instructors (hereafter referred to as Instructor A and Instructor B) were experienced instructors in both face-to-face and online courses at the university level. Both had taught at least two online class sections per semester for at least five years. Both had taken a four-week online course addressing foundations of online education required by the

university for all online instructors. The course provided the participants with experience using all student functions of Blackboard, including accessing materials such as the course syllabus and readings, participating in discussions, submitting assignments, and checking grades in the gradebook. It also exposed participants to literature on trends in online learning, online teaching tools, and planning a unit of online instruction.

Upon receipt of signed informed consent from the instructors the selection of student participants ensued. One class section (hereafter referred to as Group A) had an enrollment of 17 and the other (hereafter referred to as Group B) had 14 (although one student dropped during Week 1, so this section had 13 students). All students enrolled in both sections of the course were also "enrolled" in a "dummy course" in Blackboard with the researcher as the instructor. This course designation appeared in each student's list of "Courses where you are: student" when they logged into the system. Through the email function of this course, the researcher approached all students inviting participation (Appendix C). In addition, the instructors of the class sections were asked to post an announcement in Blackboard the first day of class (Appendix D). However, only Instructor A posted the announcement. Students were asked to submit a consent form (Appendix E) through the dummy course, and those who did not do so during the first week received a second email at the end of that week and a third at the beginning of the second week of the course (Appendix F). Students were informed that participation would have no impact on their grades, but as incentive for participation those who provided signed consents were entered into a drawing for four Amazon.com gift cards of $25 at the end of the semester.

Of the 30 students enrolled in the two sections, a total of 12 agreed to participate, eight in Group A and four in Group B (47.06% and 28.57%, respectively, of the enrolled students).

All students were female, ranging in age from 25 to 58. All were employed full time as teachers in public or private K-12 schools. All were enrolled in a Master's in Education program that would also lead to state certification in teaching English as a Foreign Language (EFL). Three participants in Group A were enrolled full time and the remaining participants attended classes part-time. All were in at least their second semester of studies. The number of previous online courses they had taken ranged from two to twelve, with a mean of 6.13 in Group A and 4.00 in Group B. When asked to rank their level of computer proficiency as "novice," "basic," "proficient," or "expert," one participant in each section chose "basic," while the others chose "proficient." Table 1 summarizes the demographic characteristics of each student.

Data Sources

Case study research does not claim any particular methods for data collection or data analysis and is not limited to qualitative data (Merriam, 2001). To gain a rich description of the dynamics in the class sections, the current study utilized multiple data sources, including both qualitative and quantitative data. This included use of instruments developed and validated by other researchers, such as the Community of Inquiry Survey (Arbaugh et al., 2008), the Cognitive Presence Coding Scheme (Garrison et al, 2001), and the Teaching Presence Coding Scheme (Anderson, Rourke, Garrison, & Archer, 2001). Open-ended survey questions for students, instructor interviews, and a survey with demographic items were also used. This section describes each of the instruments used in this study.

Table 1

Demographic Characteristics of Students

Student	Age	Gender	Semester of Study	Enrollment Status	Employment Status	Previous online courses	Computer Proficiency
Group A							
1	32	F	3	full time	full time	5	proficient
2	26	F	2	full time	full time	4	basic
3	24	F	3	part time	full time	12	proficient
4	29	F	3	part time	full time	5	proficient
5	25	F	3	full time	full time	10	proficient
6	38	F	4	part time	full time	6	proficient
7	35	F	2	part time	full time	2	proficient
8	26	F	3	part time	full time	5	proficient
M	29.38		2.88			6.29	
Group B							
1	58	F	2	part time	full time	3	basic
2	26	F	3	part time	full time	6	proficient
3	25	F	4	part time	full time	5	proficient
4	41	F	3	part time	full time	2	proficient
M	37.50		3.00			4.00	

Community of Inquiry Survey

In response to calls for a quantitative approach to research on CoI and examination of all components of the framework simultaneously, Arbaugh (2007) developed the Community of Inquiry Survey, an instrument designed to measure student perceptions of each of the three presences (i.e., social, cognitive, and teaching) using 44 Likert items. Existing instruments for which validity evidence was available were integrated into a single coherent instrument. Perceptions of teaching presence were measured using items developed by Shea, Fredericksen, Pickett and Pelz (2003). Social presence items were adapted from Richardson

and Swan (2003). The scarcity of survey-based measures of cognitive presence prompted Arbaugh to develop items based on the conceptualization of cognitive presence presented by Garrison et al. (2001). Arbaugh et al. (2008) refined the survey based on how well items reflected the CoI model as well as practical issues such as length, readability, and redundancy. The resulting 34-item survey was used in the present study (Appendix G). Items were presented as five-point Likert items ranging from 1 = *strongly agree* to 5 = *strongly disagree*. Participants could also choose not to respond to an item by selecting *N/A*.

Initial data showed that the revised Community of Inquiry survey reliably reflected the constructs of teaching, social, and cognitive presence (Arbaugh et al., 2008). With 287 subjects, the value of Cronbach's alpha was .94 for teaching presence (i.e., items 1-13), .91 for social presence (i.e., items 14-22), and .95 for cognitive presence (i.e., items 23-34). Subsequent studies supported these findings. Shea and Bidjerano (2009a) found alpha values of .96 for teaching presence, .92 for social presence and .95 for cognitive presence with 2159 subjects. Garrison, Cleveland-Innes, & Fung (2010) reported alpha values of .93, .87, and .91 with 205 subjects and Arbaugh, Bangert, and Cleveland-Innes (2010) found alpha values of .96, .91, and .95 for teaching, social, and cognitive presences, respectively.

While this instrument was developed for use in large-scale quantitative studies "that examine the CoI elements as predictor variable of course outcomes and as criterion variables in studies examining the extent to which course characteristics encourage or inhibit the development of social, teaching, and/or cognitive presence" (Arbaugh et al., 2008, p. 136), it was used in the current small-sample study to enhance the understanding of student perceptions and the dynamics of the CoI. Although many variations of this instrument exist, the current study utilized the instrument (Version 15) as developed by Arbaugh et al. because

it has been used repeatedly and was most consistently found to yield reliable scores. In the present study, with 10 valid survey responses, high reliability scores were found for each of the constructs of teaching presence ($\alpha = .93$), social presence ($\alpha = .92$), and cognitive presence ($\alpha = .97$).

Student Open-Ended Questions

Five additional open-ended survey questions (Appendix H) were appended to the Community of Inquiry survey. These questions were developed by the researcher and allowed students to further explain their perceptions of the interactions and outcomes of the course.

Community of Inquiry Coding Schemes

Many frames of analysis of Computer Mediated Conferencing (CMC) have been developed. De Wever, Schellens, Valcke, and Van Keer (2006) examined 15 different instruments commonly used for analyzing computer mediated discussion groups and presented several criticisms. Findings showed that not all presented a clear link between the theory and the instruments and that many did not present a sufficient level of detail in the number of categories, thus missing the richness of the interaction. Further, while some models (e.g., Henri, 1992; Gunawardena, Lowe, & Anderson, 1997; Veerman & Veldhuis-Diermanse, 2001) have been replicated or revised, the empirical base remains weak. Small numbers of participants, short periods of discussions, and a lack of focus on hypothesis testing all contribute to concerns about the validity of the instruments. Finally, many studies fail to report reliability evidence.

Each of these concerns was addressed in the current research through the use of the CoI coding schemes. The schemes are clearly linked to the theory and have been repeatedly used; indicators have been modified to better reflect the nuances of a CoI environment. They have also been used in a variety of course lengths, sample sizes, and course contexts. Finally, as suggested by Rourke and Anderson (2004), use of an existing protocol has several additional advantages. First, it saves the valuable time and resources needed to develop and validate a new protocol. This is especially important to the current research since the CoI coding schemes have undergone numerous revisions and validation studies. Because of the previous research, use of the existing instruments allowed for comparison of results.

Social Presence Coding Scheme

Although the parameters of this study did not prescribe content analysis of social presence, inclusion of some observations of its indicators was deemed necessary in recognition of the interactive nature of the presences. Research has found social presence to mediate teaching and cognitive presences (Garrison, Anderson, et al., 2010; Garrison, Cleveland-Innes, et al., 2010; Shea & Bidjerano, 2009a) and linked it to high levels of cognitive presence (Shea & Bidjerano). Therefore, the primary researcher perused the discussion board data for evidence of social presence indicators as defined by Rourke, Anderson, Garrison, and Archer's (1999) coding scheme.

Teaching Presence Coding Scheme

Coding for teaching presence used the indicators originally devised by Anderson et al. (2001; Appendix I). While these codes have been extensively modified by Shea, Vickers, &

Hayes (2010) to reflect assessment as a separate factor, the current study used the three-category model. Studies using the CoI survey that have raised the possibility of teaching presence being divided into two factors have isolated Design and Organization indicators as those that bifurcate into a separate factor (Arbaugh et al., 2008; Diaz et al., 2010). Adding teaching presence items related to assessment is inconsistent with the overall coherence of the model. Because the Anderson et al. coding scheme has been more frequently used and validated, it was used in the current study. Further, this scheme afforded a consistent theoretical delineation of the categories of teaching presence (i.e., design and organization, facilitating discourse, and direct instruction) with the categories corresponding to the items in the survey instrument.

Cognitive Presence Coding Scheme

Perhaps the most challenging content analysis is examination of the latent variable of cognitive presence. Meyer (2004) examined four frameworks of CMC analysis, two of which measured levels of thinking (i.e., Garrison et al., 2001; Bloom & Krathwohl, 1956), and concluded that each captured unique and different qualities of student thinking that are not a correlate of the other frameworks. For this reason, the scheme specifically designed to measure cognitive presence as defined in the CoI framework was used to generate framework-consistent data.

The cognitive presence scheme developed by Garrison et al. (2001) is the most frequently used template in the CoI literature (Appendix J). As one might expect with a latent variable, achieving acceptable levels of inter-rater reliability has been a challenge. In the initial use of the instrument, Garrison et al. (2001) achieved Cohen's Kappa levels of .35, .49,

and .74 for three transcripts. However, after three training sessions, their reliability level reached a maximum value of κ = .74. These results raised concerns about replicability of the instrument, especially given a lack of a trainer experienced in the use of this instrument. Using this tool, Park (2009) achieved 82.34% agreement, while after discussion on coding differences only a 76.48% agreement was realized in the second round. Cohen's Kappa statistics correcting for chance agreement were not reported in this study. Park concluded that "the physical mechanics of the process were replicable" (p. 153) even though inter-rater reliability was a concern.

While Rourke et al. (2001) cite 80% agreement as "usually the standard," they also note that "researchers must decide for themselves the level of acceptable agreement" (p. 5). Cohen's Kappa levels above .75 would represent excellent agreement. These levels were met by Pisutova-Gerber and Malovicova (2009) with 84% agreement and by Arrastia, Nelson, Cornille, & Liang (2011) with 83.8%. Another approach used by Akyol and Garrison (2011b), Akyol, Garrison, and Ozden (2009) and Akyol, Vaughan, and Garrison (2011) is ongoing negotiated coding. In each of these studies, raters had an initial inter-rater reliability level of .75 and used a negotiated coding approach throughout to reach agreement. Likewise, Richardson and Ice (2010) had an initial agreement level of 71% and negotiated to 100% agreement. Methods used in the present study for addressing reliability concerns inherent in the use of these instruments are described in the data analysis section.

Instructor Interviews

Each instructor was interviewed by the researcher using ten open-ended questions (Appendix K). These questions were designed to elicit the instructors' views and opinions on

the class interactions and outcomes. Follow up questions were added as topics emerged. Primary follow up topics that emerged in the discussions were:

1. comparisons between face-to-face and online teaching based on their experience teaching in that format, personal teaching style for each format, observations of student engagement, and challenges in getting to know students;
2. university expectations for online teachers (e.g., days per week to be "present" and amount of freedom granted for changing the course template);
3. required technology skills for an online teacher;
4. clarification on the expectations of both the university and the instructor himself, especially in issues surrounding teaching presence in the discussion forum;
5. perceived differences between "ideal characteristics" of an online teacher vs. a face-to-face teacher; and
6. discussion about university policies on course design and the level of control instructors have when teaching from a template (i.e., all sections of the course have the same content and learning objects).

The interviews were digitally recorded and later transcribed. Each of the interviews was approximately 45 minutes in length.

Demographic Survey

Each participant completed a basic demographic survey (Appendix L) developed by the researcher. This included information on their age, gender, major, registration status, employment status, number of previous online courses taken, and self-assessed level of computer expertise.

Table 2 summarizes the research questions, data sources used to address the question, and type of analysis that was conducted.

Table 2

Research Questions, Corresponding Data Sources, and Data Analysis Methods

Research question	Data source	Data analysis method
RQ1. What patterns of teaching presence and cognitive presence develop in an online course?		
1a. What patterns of student teaching presence develop in the discussion forum?	Student discussion board posts	Content analysis Descriptive statistics
1b. What patterns of instructor teaching presence develop in the discussion forum?	Discussion prompts Instructor discussion posts Instructor interviews	Content analysis Descriptive statistics
1c. What patterns of instructor teaching presence as demonstrated by multiple data sources develop in the course?	Assignment instructions Class announcements Discussion board prompts Grading feedback in the discussion board Grading feedback on the assignment used for the study Instructor discussion board posts Instructor interviews Syllabus	Content analysis Descriptive statistics
1d. What patterns of student cognitive presence develop in the discussion forum?	Student discussion board posts	Content analysis Descriptive statistics
RQ2. What is the relationship between teaching presence and content-based cognitive presence?		
2a. What is the relationship between student teaching presence and content-based cognitive presence in the discussion forum?	Student discussion board posts	Content analysis Descriptive statistics
2b. What is the relationship between instructor teaching presence and student content-based cognitive presence in the discussion forum?	Discussion board prompts Instructor discussion board posts Student discussion board posts	Content analysis Descriptive statistics

Table continued on next page

Table 2 cont from previous page

2c. What is the relationship between instructor teaching presence as demonstrated by multiple data sources and student content-based cognitive presence in final projects?	Assignment instructions Class announcements Discussion board prompts Grading feedback in the discussion board Grading feedback on the assignment used for the study Instructor discussion board posts Instructor interviews Syllabus Students' final projects	Content analysis Descriptive statistics
RQ3. What is the relationship between student-reported cognitive presence and content-based cognitive presence?		
3a. What is the relationship between student-reported cognitive presence and content-based cognitive presence in the discussion forum?	Student discussion board posts CoI survey Student open-ended survey responses	Content analysis Descriptive statistics
3b. What is the relationship between student-reported cognitive presence and content-based cognitive presence in the final projects?	CoI survey Students' final projects	Content analysis Descriptive statistics

Data Collection Procedure

The researcher gathered data directly from students through the dummy course set up for research purposes. The researcher and students communicated through the email function of this course. The students also completed the consent form and demographic survey through the assessment section of this course. Links were provided on the home page to help students find the form and surveys. During the last week of their course, those students who had consented to participate were granted access to the CoI survey and the open-ended

questions (merged into one survey) in the assessment section of this course. This survey was created in Blackboard and completed by students directly in the dummy course. Due to confidentiality concerns expressed during the IRB approval process, the responses were not linked to any individual student but only to the class section in which she was enrolled. Therefore the researcher could not match survey scores to a particular student. Finally, students submitted a paper that was completed in Week 6 of their course to the assignment section of the dummy course. Students who had not submitted the assignment and completed the surveys by the end of the final week of their course were sent a reminder email. Those who still did not respond were sent another email the following week and a third after the grades had been submitted.

Both instructors provided their consent forms and syllabus to the researcher through the university's password protected email system. Instructor A also provided a copy of the additional instructions he provided to students for completion of the course project that was evaluated by the researcher. Email correspondence between the researcher and the instructors was also completed through the university's email.

The Blackboard administrator for the university mined the discussion board posts of the participants from the total discussion content for each class section and provided the posts to the researcher through the university's password protected email or on GoogleDocs. A total of 513 posts were generated in Group A and 314 in Group B. Of these, the researcher received only those posts created by study participants. These included 206 student and 136 instructor posts for Group A and 106 student and 1 instructor post for Group B. This resulted in a total of 342 messages (66.67% of the posts) for Group A and 107 (34.08% of the posts) for Group B.

Each student was identified by a unique identification number given through Blackboard. To further protect the student's identity, this number was not the same as the student's university identification number and was known only to the primary researcher and the Blackboard administrator. For each post, the following information was provided in a spreadsheet format:

1. Message ID [a number assigned to the post in Blackboard]
2. In response to [ID number of the message to which it is responding, if any]
3. Posted date
4. Last edit date [if any]
5. Entry edited ["edited" appeared if the student had edited the entry after posting it]
6. Subject [the heading that appeared in the discussion board forum, such as "My reflection for week 3"]
7. Posted name [the name of the student as it appeared in the discussion board forum]
8. Message text scrubbed [the text of the message as it appeared in the discussion board forum, with extraneous HTML characters removed]
9. Scrubbed length [the number of characters in the message, including spaces, after the extraneous characters were removed]
10. Forum name [the name of the forum where students responded by creating a thread, such as "Reading Response Post for Module 2"]
11. Course name [included identification of the section in which the post appeared]
12. Course ID [a unique identifier in Blackboard for each section of each course]
13. User Pk1 [the unique identifying number for the student in Blackboard]
14. Forum main Pk1 [a unique identifying number for the forum in Blackboard]
15. Msg text [text of the message, including HTML extraneous characters, as it was mined electronically from Blackboard, such as "<p class="MsoNormal">My name is…"]
16. Body length [character length including extraneous characters and spaces]

Prior to sharing the data with the second coder, the researcher replaced any individual names referenced in messages with the student's Blackboard identification number (i.e., "user Pk1") or a teacher identification designation (e.g., "T1"). For example, a post which may have read, "Jane, I agree with you" now read "12345, I agree with you." This included searching for and replacing any nicknames used by participants as well as any times that names were accidentally misspelled. To protect the instructors' identities, their names were

changed to “T1” for Instructor A and “T2” for Instructor B. The name of the course was also removed.

The Blackboard administrator also provided the researcher with the feedback posts that the instructor provided through the Blackboard grading system to all students (including non-participants) for the discussion posts as well as the feedback given to the study participants for the assignment utilized for this study. A copy of class announcements posted by the instructor and the discussion board prompts were also given to the researcher. Finally, the administrator provided copies of the instructions for the course projects and the rubrics that were provided for the project for both class sections. Table 3 shows the number of posts for each instructor in each component of the course.

Table 3

Frequency of Instructor Posts in Blackboard Course Tools

	Instructor	
Data location	A	B
Grading feedback – discussion board	14	99
Grading feedback – projects	8	4
Class announcements	11	0
Discussion board prompts	8	8
Assignment instructions	3	3

Data Analysis

This section describes the process of data analysis, beginning with the challenges inherent in achieving reliable data through content analysis. Methods used for achieving inter-rater reliability are discussed along with examples of how the CoI coding schemes were applied to the data. The methods for analyzing the CoI survey data are also discussed. Finally, the data sources and types of analysis used to answer each research question are provided.

Coding Process

Inter-rater Reliability

In spite of the compelling reasons to use the CoI coding schemes, they were selected with reservations regarding the replicability of their use and the difficulty of achieving acceptable levels of inter-rater reliability, especially in measuring cognitive presence (Garrison et al., 2001; Park, 2009). To increase the trustworthiness of the data, two coders examined all of the student discussion posts, instructor discussion posts and instructor feedback provided to individual students for the discussion board. The second coder was familiar with the Community of Inquiry research, although she had not previously used the teaching presence and cognitive presence coding schemes. The coders reviewed the schemes and each independently coded the discussion board data for Module 1 (i.e., the discussion occurring during Week 1). Each post was coded according to the presence exhibited and the indicator(s) within that presence or multiple presences. Cohen's kappa, a measure which corrects for chance agreement between the two raters, showed no significant agreement in

either variable (κ = .13, p = .33 for teaching presence; κ = .15, p = .16 for cognitive presence). The coders then met to discuss their codes and further clarify distinctions in posts at four levels: 1) whether an instructor's post would be considered cognitive presence (i.e., the teacher modeling cognitive presence) and when a student's statement would be considered teaching presence, 2) distinctions between specific indicators in teaching presence and similar indicators in cognitive presence, 3) distinctions between categories or phases within a presence (especially between exploration and integration phases of cognitive presence) and 4) between indicators within a category/phase. This process served as further training in the coding scheme and assisted the coders in gaining a better understanding of each presence and category. The coders then independently coded the student discussion board posts for Module 2 (i.e. the second set of readings and activities for the class, posted primarily during Weeks 1 and 2) and reached strong agreement for both variables (κ = .85, p < .001 for teaching presence; κ = .94, p < .0001 for cognitive presence), again meeting to discuss discrepancies. Replicating the process used in other studies (Akyol & Garrison, 2011b; Akyol, Garrison, et al., 2009; Akyol et al., 2011; Richardson & Ice, 2010), this process of ongoing negotiated coding was utilized for the remaining data to maintain strong agreement (κ = .92, p <.001 for teaching presence; κ = 1.00, p < .001 for cognitive presence) in Modules 3-8. With all weeks combined, the raters had near perfect agreement (κ = 0.92, p < 0.001). Due to the availability of the second coder, only the primary researcher coded the remaining instructor data (i.e., course syllabus, discussion prompts, announcements, assignment instructions, and project feedback) as well as the student projects.

Social Presence Observations

While indicators of social presence were not tallied for frequencies, observations of this presence were made. This was primarily done using the search function in a word processing program to find words that suggested various indicators.

The affective indicator of expressing emotions was searched using emotion words (e.g., "sad," "excited," or "happy"), repetitious punctuation (e.g., "!!!" or "?!"), and statements that included the phrase "I feel." The results of each search were read to determine whether these items indicated the student's affective expression or if they served another function (e.g., expressing a thought or belief). For example, while the statement "I really feel my students are more open and excited to share…." appeared in both the search of "I really feel" statements and of the word "excited," the statement was expressing the student's *belief* about what her students were feeling. Several examples of the affective indicators of use of humor and self-disclosure were noted as the coders were recording data for teaching and cognitive presence, but were not formally tallied for social presence.

Several indicators in the *interactive* category were appropriately tallied in teaching or cognitive presence indicators. For example, the social presence indicator of complimenting had been tallied in the teaching presence indicator of encouraging or reinforcing student contributions (TP-FD-3) and the social presence indicator asking questions was tallied in either prompting discussion (TP-FD-5) or presenting content and questions (TP-DI-1). Because students were required to respond to a peer's post, the interactive indicator of continuing a thread was examined by searching for student posts that were a secondary response (i.e., responding to a classmate who had responded to a third student).

Finally, cohesive indicators were explored by using the search function in the same fashion as the affective indicators. Vocatives were found by searching for student names in the post of another student or the instructor. Inclusive pronouns were examined by reading results of searches for the words "us," "we," and "our."

Teaching Presence Coding

The content analysis was conducted using the CoI teaching presence coding scheme (Appendix I and summarized in Table 4). Consistent with other researchers (Osman & Herring, 2007; Shea et al., 2010) extensive discussion was required to gain a mutual understanding of application of this scheme. Acceptable levels of inter-rater reliability were achieved through the ongoing negotiated coding process as well as the use of the coding guidelines established for this study.

The coders examined each message unit (or thematic unit for the syllabus) for indicators of teaching presence. Indicators are key words, phrases or actions that portray teaching presence. Based on the indicators found in the unit, it was assigned to one of the three categories (i.e., design and organization, facilitating discourse, direct instruction).

Each category and indicator present within that category was recorded. For example, a post that stated, "[Jane][1], I enjoyed your blog post in that it was very easy to follow and understand" received a tally for teaching presence- facilitating discourse – reinforcing student contributions (TP-FD-3). If this was the only teaching presence indicator in the unit, it was categorized as facilitating discourse (TP-FD). If there was a stronger presence of

[1] To protect the identity of the participants, pseudonyms are used for all quotes.

Table 4

Teaching Presence Categories, Indicators and Codes

Category	Indicator	Code
Design and Organization	Setting curriculum	TP-DE-1
	Designing methods	TP-DE-2
	Establishing time parameters	TP-DE-3
	Utilizing medium effectively	TP-DE-4
	Establishing netiquette	TP-DE-5
	Making macro-level comments about course content	TP-DE-6
Facilitating Discourse	Identifying areas of agreement/disagreement	TP-FD-1
	Seeking to reach consensus	TP-FD-2
	Encouraging, acknowledging, or reinforcing student contributions	TP-FD-3
	Setting climate for learning	TP-FD-4
	Drawing in participants, prompting discussion	TP-FD-5
	Assessing the efficacy of the process	TP-FD-6
	Sharing experience	TP-FD-7
Direct Instruction	Present content/questions	TP-DI-1
	Focus the discussion on specific issues	TP-DI-2
	Summarize the discussion	TP-DI-3
	Confirm understanding through assessment and explanatory feedback	TP-DI-4
	Diagnose misconceptions	TP-DI-5
	Inject knowledge from diverse sources (e.g., textbook, articles, internet, personal experience). Includes pointers to resources	TP-DI-6
	Responding to technical concerns	TP-DI-7

Note. Coding scheme adapted from "Assessing teaching presence in a computer conferencing context," by T. Anderson, L. Rourke, D.R. Garrison, and W. Archer, 2001, *Journal of Asynchronous Learning Networks, 5*(2), p. 6-10.

indicators in another category (e.g., direct instruction) and this was only a supporting point, it was included in the other category. The specificity gained by coding at the indicator level was utilized to enhance the research's utility in guiding pedagogy, specifically in the areas of

facilitating discourse and direct instruction. If a particular message had multiple indicators of teaching presence, each was included in the total number of indicators present. This process is demonstrated in an instructor post that summarized, "How interesting that so many of you…," receiving a tally for teaching presence – direct instruction – summarize the discussion (TP-DI-3). However, the post went on to identify areas of agreement in the group (TP-FD-1) and to acknowledge the contributions of three different students (TP-FD-3). Because the primary focus of the post was articulating the areas of agreement and reinforcing student participation, the post was categorized as facilitating discourse (TP-FD) and the indicators TP-FD-1 and TP-FD-3 were tallied.

Using this process, the student discussion board posts were analyzed for student teaching presence. The discussion board posts of the instructors, along with the syllabus for each class section and other instructional materials (i.e., discussion prompts, assignment instructions, class announcements), were also analyzed for the instructor teaching presence indicators. Finally, the instructors' feedback in the discussion board and for the final paper was analyzed for teaching presence indicators.

To enhance the specificity of descriptions of emergent patterns in the data, total scores were calculated for each indicator observed as well as each category present. Student discussion board scores were obtained by summing the frequencies of each indicator by both module and calendar week. Indicator totals were then combined to provide a total for each teaching presence category. Cross-classification tables were used to examine the percentage of the total student discussion board posts that each category represented by both week and module. Similarly, indicators of instructor teaching presence in the discussion board were tallied. The indicators were summed into each teaching presence category. The percentage of

the total instructor posts that each category represented by both week and module were also computed in these tables. Next, the indicators observed in the instructor content outside of the discussion board (i.e., course syllabus, class announcements, assignment instructions, and grading feedback in both the discussion board and the student project) were tallied along with the discussion board data, and cross-classification tables were used to examine patterns of the categories by data source as well as overall teaching presence for each instructor. Finally, all instructor content was analyzed for teaching presence by category using a cross-classification table that included each data source in the week where it appeared (e.g., all syllabus content was included in Week 1 but announcements were included in the week that they were posted).

Cognitive Presence Coding

Cognitive presence was examined in the discussion board posts as well as a student project. While the indicators presented on the coding scheme (Appendix J and summarized in Table 5) were tallied, because cognitive processes are complex and viewed as phases of the Practical Inquiry (PI) process, each message evidencing cognitive presence was counted at only one phase (i.e., triggering event, exploration, integration, and resolution). Consistent with Garrison et al.'s (2001) heuristics, the coders *coded down* to the earlier phase if it was not clear which phase was represented and *coded up* to the later phase if clear evidence of multiple phases was present. This was done because higher levels of cognitive presence (i.e., integration and resolution) "borrow characteristics and process from previous phases" (p. 17). This method also served to improve the manageability of the research and to increase inter-rater reliability.

Table 5

Cognitive Presence Phases, Indicators and Codes

Phase	Indicator	Code
Triggering Event	Recognize problem	CP-TE-1
	Sense of puzzlement	CP-TE-2
Exploration	Divergence – within the online community	CP-EX-1
	Divergence – within a single message	CP-EX-2
	Information exchange	CP-EX-3
	Suggestions for consideration	CP-EX-4
	Brainstorming	CP-EX-5
	Leaps to conclusions	CP-EX-6
Integration	Convergence – among group members	CP-IN-1
	Convergence – within a single message	CP-IN-2
	Connecting ideas, synthesis	CP-IN-3
	Creating solutions	CP-IN-4
Resolution	Vicarious application to real world testing solutions	CP-RE-1
	Defending solutions	CP-RE-2

Note. Coding scheme from "Critical thinking, cognitive presence, and computer conferencing in distance education" (Garrison, Anderson, & Archer, 2001, pp. 15-16).

Cross-classification tables were used to examine the frequency of each cognitive presence phase in each group by both module and calendar week in the discussion board. The total number of students reaching each phase in the projects was also calculated for each group by summing individual scores. Individual student patterns were also examined by computing the percentage of posts the student had in each phase. The integration and resolution phases were combined, and students were ranked within their group according to percentage of total posts in these phases.

Multiple or No Presences

Many messages had more than one type of presence and were coded as such. For example, some posts both reinforced another student's contribution (TP-FD-3) and integrated her own experience with that of the peer's (CP-IN-3). Another post exhibited both cognitive presence (CP-EX-3) and two teaching presence indicators (TP-FD-3 and TP-FD-4).

Because social presence was beyond the scope of this research, there were messages that were tallied as "other," not fitting either teaching or cognitive presence. This included both social presence content and a message that was asking for clarification. Like the other messages, these were tallied for students, instructors, and class totals.

Unit of Analysis

Rourke et al. (2001) conclude that as the qualitative researcher considers factors such as meaningfulness, reliability, efficiency, and productivity, the selection of a unit of analysis becomes a complex and challenging task. In a survey of 19 computer mediated content analysis studies, they found common units of analysis to be the sentence unit, paragraph unit, message unit, thematic unit, and illocutionary unit.

In this study, the unit of analysis for the discussion transcripts, discussion prompts, instructor grading feedback for the discussion board and the projects, class announcements, and assignment instructions was the message unit. The message unit refers to each post; therefore, each post was considered as one unit regardless of length. This unit is easily identified and, therefore, the number of cases is easily agreed upon by the raters. Further, it offers a more manageable number of cases than the sentence or paragraph unit.

Students' final papers and the syllabuses were coded utilizing the thematic unit as the unit of analysis. While this unit can lead to lower reliability due to the subjectivity of what constitutes it, it offers important advantages in allowing for a single thought unit or idea to be extracted from the lengthier content found in multiple-page documents.

Interpretation of the Coding Schemes

The coders found that the coding schemes lacked clarity concerning which participants (i.e., instructor or student) should be considered to exhibit each presence (in order to be consistent with other studies), how distinctions were to be made between categories/phases within a presence, and how indicators were to be interpreted that appeared to replicate another indicator in a different presence, category or phase. Specifically, coders had to clarify whether an instructor's post would be considered cognitive presence (i.e., the teacher modeling cognitive presence) or if teaching presence indicators addressed the same content from a different perspective. Similarly, it was necessary to determine when a student's statement would be considered teaching presence, especially if the content could also fit a cognitive presence indicator. Further, distinctions between categories or phases within a presence (especially between exploration and integration phases of cognitive presence) and between indicators within a category/phase were required.

To resolve these issues, the coders reviewed the overall theoretical framework as well as the definitions of each presence and each category/phase within that presence. Coding procedures and findings from other content analysis studies using these coding schemes were also reviewed. As a result, the coders established three criteria for choosing the final codes: 1) the author of the post (i.e., instructors were coded as teaching presence while student posts

were coded as either teaching or cognitive presence); 2) the perceived primary intent of the post (i.e., if for the benefit of another participant's learning, it was teaching presence; if part of making sense out of the material for oneself, it was cognitive presence); and 3) whether a cognitive presence post supported a conclusion or hypothesis (i.e., demonstrated integration) or remained at the exploration phase. They also further clarified how some common problematic content would be handled.

A brief explanation is provided here of the interpretations for those indicators found to be most problematic. This description includes indicators that needed to be clarified due to overlap between cognitive and teaching presence indicators. It also includes examples of how indicators were distinguished within each presence. Appendix M summarizes the types of content addressed, the indicators to which that content could be assigned, and how the content was interpreted in this study.

The most frequent problematic content was participants' sharing of personal experiences. According to the coding scheme, such discourse could have been coded in any of five different ways (emphasis added):

1. Teaching Presence – Facilitating Discourse – *Sharing experience* (TP-FD-7).
2. Teaching Presence – Direct Instruction – Inject knowledge from diverse sources … *personal experience* (TP-DI-6).
3. Cognitive Presence – Exploration – Information exchange – *personal narratives/descriptions/facts* (CP-EX-3).
4. Cognitive Presence – Integration – Connecting ideas, synthesis – integrating information from…*personal experience* (CP-IN-3).

5. Cognitive Presence – Resolution – Vicarious application to real world testing solutions – *providing examples* of how problems were solved (CP-RE-1).

Using the criteria established for assigning codes, the researchers first considered the source of the post. When the teacher described an experience, the post generally fit one of the teaching presence indicators. No instructor posts were coded as cognitive presence. On the other hand, the student posts with experience sharing were generally coded under cognitive presence, with only a few coded as teaching presence. For example, when the instructor shared an experience she had overseas in response to a student sharing a similar experience, it was generally coded as teaching presence – facilitating discourse – sharing experience (TP-FD-7). However, the student's post about her experience was often considered cognitive presence – exploration – information exchange (CP-EX-3). While it could be argued that this distinction is antithetical to the framework's premise that all participants engage in each of the presences (Garrison et al., 1999), research has emphasized the preeminent role of the teacher in teaching presence (Garrison & Cleveland-Innes, 2005; Shea et al., 2006). Likewise, although the teacher could be modeling cognitive presence, this construct has largely been evaluated using student posts (Akyol & Garrison, 2011a; Kanuka, Rourke, & Laflamme, 2007; Maddrell, 2011; Park, 2009; Yang et al., 2011). The wording of the CoI survey (Arbaugh et al., 2008) further reflects this assumption of teacher-weighted teaching presence and student-weighted cognitive presence as it begins teaching presence items with "the instructor…" and uses personal pronouns such as "I" and "my" for cognitive presence items.

The second guideline utilized, considering the implied primary intent of the post, served to further clarify these issues. If the experience was shared for the benefit of other participants, such as sharing a resource the participant had used, it was considered in teaching

presence. If it demonstrated a participant's grappling with the problem being discussed, it was considered cognitive presence. For example, the discussion prompt for the first week of the course invited students to reflect on the "experiences/people/factors that were influential in your language development…." These could be viewed as inviting others to react and therefore be coded as teaching presence – facilitating discourse – sharing experience (TP-FD-7). However, because the post was directly connected to the discussion prompt with the implied primary intent to "make sense of a problem" of language learning and "search for relevant information" (Garrison et al., 2001, p. 14), it was coded as cognitive presence – exploration – information exchange (CP-EX-3). Integrating these first two guidelines, when the instructor responded to a student's post by sharing an experience of her own and pointing out a contrast, it was coded as TP-FD-7. The implied primary intent of this post, in part because it came from the instructor, was to engage the student in discourse, to encourage the student's construction of meaning, and to shape her understanding. When the instructor posted an experience that expounded upon content and gave the student more information to integrate in understanding the issues, it was considered teaching presence – direct instruction – inject knowledge (TP-DI-6).

Finally, because other research (e.g. Garrison et al., 2001; Maddrell, 2011) found the greatest source of inter-rater disagreement to be between the exploration and integration phases of cognitive presence, the coders in this study clarified how these phases would be distinguished. Content was examined to determine whether a description of an experience was clearly integrated with other content, such as the textbook or other readings, for the purpose of supporting a conclusion or defending a hypothesis. If the experience simply added another example or more information, it was coded at the exploration stage (CP-EX-3).

These posts often began with phrases like "this reminds me of…," "I remember…," or "I also have a firsthand experience…." One student discussed the course topic of code-switching:

> The subject of codeswitching [*sic*] is fascinating to me. Last week at parent-teacher conferences I spoke with a mother… [who] retold a story about going to the grocery store with [her son]…. He said, 'Mom, I can smell all of the pepinos'. She said, 'you mean cucumbers?' He said, 'No, the pepinos'. He insisted on calling them pepinos because he had never heard the actual word cucumber.

The student shared the story as an example, but did not connect it to any conclusion or to the post to which she was responding. She was demonstrating an understanding of the concept of code-switching. On the other hand, posts were coded at the integration level (CP-IN-3) when connections were made to other content or when they were used to support a hypothesis or conclusion. Another student also responded to a peer on the topic of code-switching by sharing her experience conversing with her own parents who speak in their native tongue. She presents a possible explanation for a dilemma the peer had described with students:

> I speak better English and my parents speak better in our language, we receptively have enough to understand what the other is saying but are more comfortable speaking in our chosen language. Perhaps that is what is happening with your students. It is difficult to translate as the expressive language is limited, but receptive is functional.

While there were no students who shared an experience of resolving a problem, this would have been coded as resolution if a solution had been proposed to a problem or situation and the student shared the experience as a way of showing whether the solution worked. The experience could also have been used as an example for defending why a solution was appropriate.

Another problematic overlap between teaching presence and cognitive presence was the presence of questions or "I wonder" statements. These could have been coded as teaching presence – facilitating discourse – prompting discussion (TP-FD-5) or a cognitive presence –

triggering event (CP-TE-1 or CP-TE-2). Again, the source of the statement and the implied primary intent were the determinants in the distinction. Questions posed by students were generally considered a part of the cognitive presence process, but a question that directly invited a response of clarification or asked for resources was generally coded TP-FD-5. For example, one student responded to a peer asking for more specific information on how she handled a particular problem. Another asked if anyone knew of grants available connected to the issue. These posts inviting responses were therefore coded as facilitating discourse (TP-FD-5).

Because posts could contain evidence of both cognitive and teaching presence, questions posed at higher phases of cognitive presence were coded with the appropriate cognitive presence code but also as TP-FD-5 if they clearly invited a response. For example, one student's post clearly integrated her classroom experience with the class reading and the experience of a peer (therefore coded in cognitive presence integration stage) but also concluded with a question, "I am curious to know how others have approached parents concerning this matter." This could have been considered a triggering event and was certainly part of her process of creating a solution. Because each post received (at most) one code for cognitive presence, the post was coded up to the integration phase. However, the question also clearly invited her peers to share their experiences and was therefore also coded as teaching presence – facilitating discourse – prompting discussion (TP-FD-5).

On the other hand, some questions were more rhetorical in nature and reflected the student's curiosity, as if "thinking out loud." Reacting to a fact presented in the text on the number of languages in the world, one student mused, "I wonder how many languages the average person can actually name?" Because she probably was not prompting others to

respond with a number or to research this fact for her, it was considered a "sense of puzzlement" (CP-TE-2).

A third area requiring clarification was coding for quotations from the textbook or articles. These could have been coded as teaching presence – direct instruction – present content/questions (TP-DI-1), teaching presence – direct instruction – inject knowledge (TP-DI-6), cognitive presence – exploration – divergence (CP-EX-2), or cognitive presence – integration – connecting ideas (CP-IN-3). Generally, student quotations were coded as part of the cognitive presence process unless they were quoting from a resource outside the class. If it was a resource others had not been presented with as part of the course content, it was considered to be primarily for the purpose of sharing her knowledge with others and was coded as direct instruction in teaching presence. If the presentation of the content culminated in a question, it was coded as TP-DI-1, whereas just injecting the knowledge was coded as TP-DI-6. However, quotations from the textbook or other class readings were generally used as part of the student's process of making meaning of the material. If the quotation was integrated with some other information (such as another student's post or the student's personal experience) to support a hypothesis or create a solution, through comparison/contrast or synthesis, it was coded as integration (CP-IN-3). If there was not an explicit connection but was simply a part of restating what was read or noting that it was "interesting," it was coded at the exploration phase (CP-EX-3).

A fourth clarification required in the coding process was the distinction between the teaching presence indicators of setting curriculum (TP-DE-1) and making macro-level comments about the course content (TP-DE-6). Generally, when the unit primarily described the curriculum (e.g., listing the objectives or units for the course in the syllabus) it was

considered setting curriculum (TP-DE-1). However, if the statement reflected primarily the intent or purpose of the task, such as a statement about why an activity was included, why a particular method or material was used, or how the activity or reading would benefit the student's learning, it was considered making macro-level comments about course content (TP-DE-6).

Finally, clarification of codes was necessary for content that reinforced or acknowledged another person's contribution. Again, applying the established guidelines used in the present study, the source of the post was first considered. Instructor posts were coded as teaching presence. If the post served to encourage the student through approval of the content or acknowledgement of an insight, it was coded as facilitating discourse – encouraging, acknowledging, or reinforcing contributions (TP-FD-3). If the post used a word of assessment (e.g., "right") and offered further explanation, it was coded as direct instruction – confirming understanding through assessment and explanatory feedback (TP-DI-4). Student posts, however, were generally coded as cognitive presence. However, statements of encouragement were also coded as TP-FD-3. If the student offered encouragement (e.g., "I found your post to be very interesting") and went on to share a similar experience without connecting it to the peer's experience or using it to support a conclusion, it was coded in the exploration phase of cognitive presence with the indicator of information exchange (CP-EX-3). If the student went on to share additional information or use her experience to support an idea or conclusion, it was coded as integration – convergence (CP-IN-1).

Community of Inquiry Survey

Each student's perception of her cognitive presence was summarized by grouping the items corresponding to each phase (Arbaugh et al., 2008). Items 23 through 25 corresponded to the triggering event phase:

23. Problems posed increased my interest in course issues.
24. Course activities piqued my curiosity.
25. I felt motivated to explore content related questions.

Items 26 through 28 corresponded to the exploration phase:

26. I utilized a variety of information sources to explore problems posed in this course.
27. Brainstorming and finding relevant information helped me resolve content related questions.
28. Online discussions were valuable in helping me appreciate different perspectives.

Items 29 through 31 addressed the integration phase of cognitive presence:

29. Combining new information helped me answer questions raised in course activities.
30. Learning activities helped me construct explanations/solutions.
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.

Items 32 through 34 corresponded to cognition at the resolution phase:

32. I can describe ways to test and apply the knowledge created in this course.
33. I have developed solutions to course problems that can be applied in practice.
34. I can apply the knowledge created in this course to my work or other non-class related activities.

A mean score was computed for each phase for each student. These scores were then used to compute a mean score for each group at each phase.

Data Analysis Methods for Each Research Question

For descriptive statistics, SPSS statistical software was utilized. A descriptive analysis of the demographic data was conducted, using frequencies of each response as well as mean scores. Descriptive statistics were also calculated for both the content analysis and the CoI survey data. Due to the difference in size of the groups, comparisons were made based on the percentage of the total cases in that group. This section summarizes the analyses used for each research question.

For Research Question 1 (RQ1), "What patterns of teaching presence and cognitive presence develop in an online course?" the relative frequencies (percent of total for the group) of each category/phase were compared for the two classes. First, student teaching presence was examined for both groups using a cross-classification table to calculate the percentage of student posts in each category observed in each module. Frequency counts of each indicator were also calculated for each group. Similarly, cross-classification tables were used to examine instructor teaching presence in each category by module, and frequency counts were summed for each indicator. Another cross-classification table was used to examine other instructor contributions (i.e., course syllabus, class announcements, assignment instructions, and grading feedback in both the discussion board and the student project) for patterns of teaching presence by category. These data were then combined with the discussion board data to examine instructor teaching presence by week. Each data source was assigned to the calendar week in which it appeared in the course management system, and a cross-classification table was created for instructor teaching presence in each category by week using all instructor content. Finally, student cognitive presence in the discussion board was

examined using a cross-classification table for each phase of cognitive presence (i.e., triggering event, exploration, integration, and resolution) by calendar week and another cross-classification table by course module. The frequency of each indicator in each group was also summed.

For Research Question 2 (RQ2), "What is the relationship between teaching presence and content-based cognitive presence?" relationships between the two presences as well as interactions between the instructors and students were examined. First, student posts in the discussion board that demonstrated both teaching and cognitive presence were analyzed for both group and individual student patterns. A cross-classification table was used to assess the frequency of teaching presence posts in each category that also exhibited each phase of cognitive presence for each group. The individual posts that exhibited both presences were also tallied for frequencies of specific indicators. Patterns for individual students were also examined using SPSS to determine the percentage of posts each student had with evidence of teaching presence. These levels of teaching presence were ranked within groups and compared to each student's ranking for percentage of posts at high levels (i.e., integration and resolution) of cognitive presence. Secondly, cross-classification tables were used to examine relationships between each instructor's teaching presence and his students' cognitive presence in the discussion board. Finally, all instructor teaching presence data sources were summed by category to scrutinize relationships between instructors' teaching presence throughout the course (including outside the discussion forum) and the percentage of students in each group that reached each level of cognitive presence in their individual projects. Recognizing that different learning styles may lead students to reach different levels of cognitive presence in group interaction (i.e., the discussion board) than in individual activities (i.e., the student

project), comparisons were also made between each individual student's final project data and her percentage of discussion board posts at the integration and resolution phases.

For Research Question 3 (RQ3), "What is the relationship between student-reported cognitive presence and content-based cognitive presence?" the Community of Inquiry survey, open-ended survey, discussion board data and final projects were examined. First, mean survey scores for each group were computed for each cognitive presence phase. This was done by clustering the items corresponding to each phase and computing the mean score for each cluster. Mean scores for each group were also computed for lower-level cognitive presence (i.e., scores in the triggering event and exploration clusters combined) and higher-level cognitive presence (i.e., integration and resolution clusters combined). Next, the mean scores at each phase were compared to the percentage of discussion board posts in that phase for each group. Finally, the percentage of students in each group who reached the resolution phase at any time during the course (i.e., in the discussion board and/or the final project) was compared to the percentage of students in the group who agreed or strongly agreed with the resolution items on the CoI survey.

Methods for Verification/Trustworthiness

This study employed several methods for ensuring the trustworthiness of the findings: triangulation; multiple investigators; peer examination; rich, thick description; and multiple cases (Merriam, 2001). Each of these methods is described in this section.

First, triangulation of multiple data sources was employed. For example, the patterns which emerged in the content analysis of discussion board transcripts was compared to

themes present in the student surveys and instructor interviews. Similarly, the survey data were compared to both the discussion board data and the students' final projects.

Different perspectives were also gained by using multiple investigators to examine the student and instructor discussion posts as well as the instructors' grading feedback to the students. Ensuring inter-rater reliability is a significant challenge when using content analysis as a research tool. Rourke et al. (2001) reviewed 19 studies using various content analysis models and found that only 10 reported reliability data. To achieve a satisfactory level of inter-rater reliability, the present study utilized a method on ongoing negotiated coding (Akyol & Garrison, 2011b; Akyol, Garrison et al., 2009; Akyol et al., 2011; Richardson & Ice, 2010). The researchers also engaged in a process of continuous checking of codes (Creswell, 2009). The second coder also engaged in peer examination, a process where she reviewed the findings and commented on them as they emerged (Merriam, 2001).

Validity of the findings was also enhanced through rich, thick description of the cases. Examples are cited from the data sources in order to portray different perspectives on the themes. The presence of negative or discrepant information which run counter to those themes is also reported (Creswell, 2009). Pattern matching was also employed in matching the patterns observed in each of the class sections to the theoretical pattern (Trochim, 1985).

Finally, to increase the generalizability of the findings, multiple cases were examined. Yin (1994) proposes use of *replication logic* for multiple case studies. Using a "rich, theoretical framework" (p. 46) cases are selected so that they either predict similar results (i.e., literal replication) or produce contrasting results for predictable reasons (i.e., theoretical replication). The framework states the conditions in which a particular phenomenon (e.g., higher order thinking) is likely to be found. Cases that do not work as predicted provide

insight useful in modification of the theory. In this study, class sections were selected with the same course design and materials so that one might predict similar results between groups.

Ethical Considerations

All participants in this study were informed that participation was voluntary and could be revoked at any time without penalty or prejudice. Informed consent was acquired from all volunteers at the beginning of the course. It was made clear in the informed consent (Appendix E), the email (Appendix C) and class announcement (Appendix D) inviting participation, and in follow-up emails inviting participation (Appendix F) that student participation and survey opinions expressed would not impact the student's grade. Further, students were informed that the instructors would not be informed as to which students participated and would not have access to individual student end-of course CoI surveys.

An important ethical concern in the conduct of this research was confidentiality with regard to participant identities with all collected data and in the research findings. To ensure the data were protected, the data collection for the demographic and CoI surveys was conducted via the university's secure email and Blackboard. Each subject's demographic responses were identifiable to the researcher in order to correlate them with postings and student projects. To further protect students' confidentiality, the CoI survey responses were identifiable to the researcher only by class section and were not connected to the individual student. Instructors did not have access to the survey data, and students were informed of this prior to their participation as well as by the disclaimer on each of the surveys, "Your responses to this survey will be confidential and only used for research purposes. Your instructor will not have access to your individual responses."

Identities of individuals were protected in the reporting of data by using pseudonyms in quotations of discussion board postings or class projects. Further, names of cities, school districts, and the university were not used.

Approval for the study was obtained by the researcher from the Institutional Review Board from both Northern Illinois University and the university where the course was offered. To this end all necessary safeguards with regard to the use of human subjects, as outlined by the Collaborative Institutional Training Initiative and the IRB of both universities, were followed. Participants were notified that there were no foreseeable risks associated with this study.

CHAPTER 4

FINDINGS

This chapter summarizes the findings for each of the research questions. Content analysis data for the student and instructor discussion board posts, class announcements, assignment instructions, syllabuses and grading feedback are provided as well as summaries of the perceptions expressed by both the instructors in their interviews and the students in the Community of Inquiry (CoI) survey and open-ended questions. The data from applicable sources are integrated in response to each of the research questions.

For Research Question 1 (RQ1), "What patterns of teaching presence and cognitive presence develop in an online course?", the development of both student and teaching presence over time in the discussion board is discussed, including data by both the category/phase and indicator level. Instructor teaching presence in the discussion board and in the other class documents is also portrayed over time, in categories, and by indicators. For Research Question 2 (RQ2), "What is the relationship between teaching presence and content-based cognitive presence?", data is presented on the relationships between student teaching and cognitive presence in the discussion board, instructor teaching presence and student cognitive presence in the discussion board, and overall instructor teaching presence and student cognitive presence in the class projects. Both student and instructor perceptions are presented in light of the content analysis data in response to Research Question 3 (RQ3), "What is the relationship between student reported cognitive presence and content-based

cognitive presence?" The Community of Inquiry (CoI) survey responses are reviewed in light of both the student discussion board data and final projects.

While an in-depth analysis of social presence for these class sections was beyond the scope of this research, the CoI framework considers social, teaching, and cognitive presence to be interdependent. Therefore, to provide a more accurate and complete description of the dynamics in each class section, this chapter begins with some general observations on evidence of social presence in the two groups (hereafter referred to as Group A and Group B). Then each of the research questions is addressed.

Observations of Social Presence

In their interviews, both instructors described the challenge of developing relationships in an online medium. Instructor A described an "ideal" online teacher as one who was adept with technology but also "very personal and personable in an electronic format… kind of an 'online charisma' or something." He[2] submitted that an online teacher is challenged to develop a connection and relationship with students as people:

> In face-to-face you can have a *true* personal relationship that comes from personal [interaction]…. Be very personal in your intro. Respond personally to students' intros. Take notes. Keep in mind who they are so that every time you're providing feedback on an assignment you've got a whole person in your mind, right? With a whole professional life and set of experiences. And also are they married? Do they have kids? … Make sure that this is a person that you're dealing with, but in face-to-face they're obviously a person; they're right in front of you.

Instructor B noted the importance of frequent communication with students in developing these relationships. He believed that the frequency of his emails with students meant that

[2] To further protect the identity of the instructors, both are referred to using masculine pronouns.

"some of [his] students might tell you that they actually know [him]."

Both instructors also emphasized that these relationships should be characterized by respect, a necessary component for students to feel safe enough to express their ideas. Instructor B commented:

> The thing about it is you can also use [the online] platform to treat your student with respect…. My students deserve the very utmost respect. Every question that they ask becomes a serious, serious, serious matter. And so I go in to answer the question and to respect them for who they are. So for me, the online teacher should approach the relationship between her or his student just like a personal relationship, even though you are only seeing each other online. That is true communication.

The expectation of mutual respect was also emphasized for students in the syllabus (which was identical for both class sections). Three separate sections of the syllabus stated the obligation of students to "respect diversity of thought, opinion and background in all aspects of interaction and communication." While this requirement was not incorporated into the grading rubrics for the discussion board, the theme was also present in the rubric for one of the assignments.

Specific indicators of social presence were observed in each of the categories of emotional expression, open communication, and group cohesion (Garrison, Anderson, & Archer, 1999). To give the reader a sense of the climate in each class section, some brief examples of these indicators are provided here.

In both class sections students engaged in the emotional expression indicators of self-disclosure, expressing vulnerability, and sharing information about life outside of class (Rourke, Anderson, Garrison, & Archer, 1999). While much of the sharing of personal experiences was connected to students' teaching experiences and coded as part of the cognitive presence phases, some were in the context of self-disclosure and vulnerability

phrases like “I admit…,” “I’m embarrassed to say…,” or “I was a little ashamed….” Instructor A often demonstrated these indicators in the discussion forum as he described personal experiences, family life, and even a level of embarrassment at his lack of fluency in his heritage language. Instructor B’s only post in the discussion forum, his introduction, was primarily a description of his personal background, experiences and likes/dislikes.

The discussion posts of both the students and Instructor A also reflected open communication indicators of using the reply feature, quoting or directly referencing another post, expressing appreciation to a peer, and expressing agreement (Rourke et al., 1999). After the initial post for each week, students generally used the reply feature to respond to a peer’s thread. In these posts they often made direct reference to and/or expressed appreciation for the content. While posts expressing agreement were often coded in cognitive presence as convergence among group members (i.e., integration phase), they were also demonstrations of open communication.

Group cohesion indicators of addressing someone by name, use of inclusive pronouns, using salutations and phatics, and other communication serving a purely social function (Rourke et al., 1999) were less evident, except for Group A’s use of names. Instructor A modeled addressing participants by name as he responded to each student’s introduction in the first module with a post beginning, “Hi, [name]!” or “It’s good to see you again, [name]!” In subsequent modules he incorporated names into the post, often beginning with a phrase including the name of the student to whom he was responding (e.g., “I think you are right on track, [name], when you say….”) and incorporating other names in his explanation (e.g., “As [name] and [name] will attest…”). As a result all but two students’ names appeared in his posts in the forum for Module 2 and all but three in Module 3. Students in this group also

began to use each other's names, increasing from 14.29% of the responses addressing the peer by name in Module 1 to 42.86% in Module 2. This practice continued through Module 8 where 37.04% of the posts responding to another included the name of the author of the original post. Group B did not respond to peers' posts in Module 1, but 28.57% of the response posts used first names in the second module. However, this practice was not sustained and only 7.14% of the response posts in Module 8 used peer names. Only one post (found in Group A) clearly used an inclusive pronoun to refer to the group:

> I feel like these points keep getting brought up throughout the text and course conversations…. We have to understand if we are trying to add to the child's language or if we are trying to replace it.

In both groups, participants used other inclusive pronouns in reference to a larger group to which she belonged (i.e., family, colleagues, or school district) or to which all members of the group belonged, such as "educators," "Americans," and even "human beings." Only one thread (three posts in Group B) were expressly for social purposes, as one participant described the devastation experienced by families in her district resulting from a recent tornado and another student responded.

Research Question 1

The content analysis data for the discussion board and for the course instructional materials as well as the instructors' perceptions communicated in their interviews provided useful information in response to Research Question 1, "What patterns of teaching presence and cognitive presence develop in an online course?" Four types of patterns were examined, corresponding to four sub-questions:

RQ 1a. What patterns of student teaching presence develop in the discussion forum?

RQ 1b. What patterns of instructor teaching presence develop in the discussion forum?

RQ 1c. What patterns of instructor teaching presence as demonstrated by multiple data sources develop in the course?

RQ 1d. What patterns of student cognitive presence develop in the discussion forum?

In this section, each sub-question is addressed by presenting frequency data for each group and/or instructor. Brief examples from the data sources that exhibited various categories, phases, or indicators are also given. Due to the difference in class size (n = 8 in Group A and n = 4 in Group B) the frequency data are also reported as percentage within each group for ease of comparison.

RQ 1a. What Patterns of Student Teaching Presence Develop in the Discussion Forum?

While the coding process allowed a student post to include both teaching presence and cognitive presence, only 19.42% (f = 40) of the posts in Group A and 8.49% (f = 9) of the posts in Group B contained indicators of teaching presence. While one student in Group A contributed 10 of the 40 teaching presence posts, excluding that student's data still resulted in 14.56% of the group's total posts demonstrating teaching presence, nearly twice the level of Group B.

Student Teaching Presence Patterns Over Time

As seen in Table 6 and Figure 3, overall teaching presence was highest for Group A in the first Module of the course (64.29% of the total posts), tapering off in Modules 2 through 5

Table 6

Number of Student Teaching Presence Posts by Module in Discussion Board

	Module									
Category	1	2	3	4	5	6	7	8	café	Total
	Group A									
Design and Organization	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (50.00)	1 (0.49)
Direct Instruction	1 (7.14)	2 (7.14)	1 (3.57)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	4 (1.94)
Facilitating Discourse	8 (57.14)	8 (28.57)	6 (21.43)	3 (10.71)	2 (7.41)	3 (12.00)	3 (11.54)	2 (7.14)	0 (0.00)	35 (16.99)
No teaching presence	5 (35.71)	18 (64.29)	21 (75.00)	25 (89.29)	25 (92.59)	22 (88.00)	23 (88.46)	26 (92.86)	1 (50.00)	166 (80.58)
Total	14 (100.00)	28 (100.00)	28 (100.00)	28 (100.00)	27 (100.00)	25 (100.00)	26 (100.00)	28 (100.00)	2 (100.00)	206 (100.00)
	Group B									
Design and Organization	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Direct Instruction	0 (0.00)	0 (0.00)	0 (0.00)	1 (6.67)	1 (7.69)	1 (6.67)	0 (0.00)	0 (0.00)	0 (0.00)	3 (2.83)
Facilitating Discourse	0 (0.00)	2 (14.29)	1 (7.14)	2 (13.33)	0 (0.00)	0 (0.00)	1 (7.14)	0 (0.00)	0 (0.00)	6 (5.66)
No teaching presence	4 (100.00)	12 (85.71)	13 (92.86)	12 (80.00)	12 (92.31)	14 (93.33)	13 (92.86)	14 (100.00)	3 (100.00)	97 (91.51)
Total	4 (100.00)	14 (100.00)	14 (100.00)	15 (100.00)	13 (100.00)	15 (100.00)	14 (100.00)	14 (100.00)	3 (100.00)	106 (100.00)

Note. Numbers in in parentheses are the percentage of the module. No teaching presence = posts with no teaching presence indicator observed; café = a forum in the discussion board for non-content related discussion (e.g. discussing a course assignment, asking about a professional resource, or sharing personal interests).

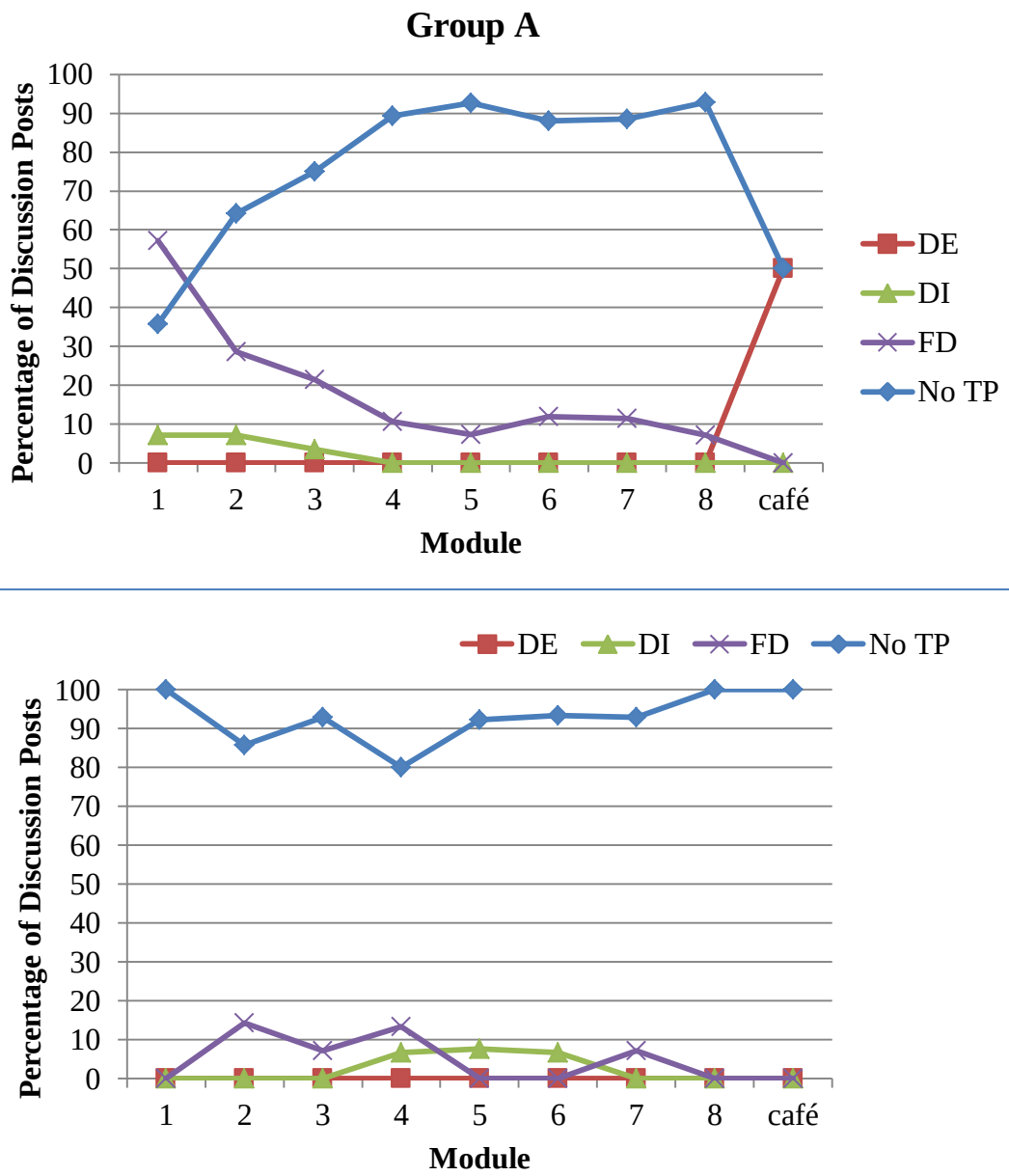

Figure 3. Student discussion board posts exhibiting each category of teaching presence for each group. *Note.* Café = a forum in the discussion board for non-content related discussion (e.g. discussing a course assignment, asking about a professional resource, or sharing personal interests); DE = Design and organization; DI = Direct Instruction; FD = Facilitating Discourse; No TP = posts with no indicators of teaching presence observed.

to 7.41%. After an increase in Module 6 (12.00%), it again decreased for Modules 7 and 8 (11.54% and 7.14%, respectively). Group B's level of teaching presence was consistently low throughout the course, with two modules and the course "café" (i.e., a separate forum in the discussion board in which students could discuss personal matters, ask questions about the course in general, or discuss issues unrelated to the topic for the week) showing no evidence of teaching presence. The remaining modules ranged from 6.67% of the total posts in Module 6 to a high of 20.00% in Module 4. Group B's level of teaching presence exceeded Group A's only in Module 4 (with 20.00% of the total posts for the module in Group B and 10.71% in Group A demonstrating teaching presence) and in Module 5 (7.69% in Group B and 7.41% in Group A.

Facilitating discourse (coded as FD) was the category of teaching presence most frequently represented, comprising 87.50% of the teaching presence posts in Group A and 66.67% in Group B. Direct instruction (coded as DI) posts accounted for 10.00% of Group A's teaching presence posts and 33.33% of Group B's. Only one post, found in Group A, was in the design and organization (coded as DE) category (2.50% of the group's total teaching presence).

Patterns of Teaching Presence Indicators

The types of posts making up each category are more clearly understood by examining the specific indicators present within the posts. Table 7 presents the number of posts exhibiting each teaching presence indicator in each group. Because two posts in Group A each had two indicators, 42 indicators are shown for the 40 posts with teaching presence. The indicators are further described, along with examples from the posts, in this section.

Table 7

Frequency of Student Teaching Presence Indicators in Discussion Board

Category and Indicator	Code	Group	
		A	B
Design and Organization (DE)			
Setting curriculum	TP-DE-1	0	0
Designing methods	TP-DE-2	0	0
Establishing time parameters	TP-DE-3	0	0
Utilizing medium effectively	TP-DE-4	1	0
Establishing netiquette	TP-DE-5	0	0
Making macro-level comments about course content	TP-DE-6	0	0
Total Design and Organization (DE)		**1**	**0**
Facilitating Discourse (FD)			
Identifying areas of agreement/disagreement	TP-FD-1	1	0
Seeking to reach consensus	TP-FD-2	0	0
Encouraging, acknowledging, or reinforcing student contributions	TP-FD-3	20	5
Setting climate for learning	TP-FD-4	7	0
Drawing in participants, prompting discussion	TP-FD-5	6	1
Assessing the efficacy of the process	TP-FD-6	0	0
Sharing experience	TP-FD-7	3	0
Total Facilitating Discourse (FD)		**37**	**6**
Direct Instruction (DI)			
Present content/questions	TP-DI-1	0	0
Focus the discussion on specific issues	TP-DI-2	0	0
Summarize the discussion	TP-DI-3	0	0
Confirm understanding through assessment and explanatory feedback	TP-DI-4	0	0
Diagnose misconceptions	TP-DI-5	0	0
Inject knowledge from diverse sources (e.g., textbook, articles, internet, personal experience). Includes pointers to resources	TP-DI-6	4	3
Responding to technical concerns	TP-DI-7	0	0
Total Direct Instruction (DI)		**4**	**3**

Note. TP = Teaching Presence, DE = Direct Instruction, FD = Facilitating Discourse, DI = Direct Instruction. Codes represent the presence followed by the category and indicator (e.g., TP-DI-1 = Teaching Presence – Direct Instruction – indicator #1). Coding scheme adapted from "Assessing teaching presence in a computer conferencing context," by T. Anderson, L. Rourke, D.R. Garrison, and W. Archer, 2001, *Journal of Asynchronous Learning Networks, 5*(2), p. 6-10.

Facilitating discourse indicators. The predominant facilitating discourse indicator in both groups was that of encouraging, acknowledging, or reinforcing the post of a peer (TP-FD-3). In fact, this indicator was the most prominent of all teaching presence indicators, present in at least half of the total teaching presence posts in each group (*f* = 20, 50.00% in Group A; *f* = 5, 55.56% in Group B). Over half of these occurred in the first three weeks of the course (13 of Group A's and 3 of Group B's). These posts often expressed appreciation for the peer's post or made a qualitative statement about it. For example, one student expressed appreciation saying, "Hi [Jane] Thank you for sharing your personal connections with the readings." Another student reinforced the quality of her peer's post stating, "Your observation is a perceptive one." Others were more general with phrases like, "Nice jobe [*sic*]!", "[Susan], Lots of good things in your post!", or "I found your reading response…so interesting!" It should be noted that other posts also expressed appreciation or reinforced the peer's post but were not coded as facilitating discourse. When the phrase of acknowledgment was for the purpose of agreeing and building on the content of the peer's post, they were coded as cognitive presence at the integration phase (CP-IN-1). For example, a student who reinforced the quality of her peer's post stated, "I think that you make a really valid point about kids themselves wanting to fit in" and went on to elaborate on the idea by describing the challenges her students face in fitting in with the "majority group" that speaks English. In doing so the phrase reinforcing the peer's post as "a valid point" was used to directly integrate her ideas with those of her peer, and was thus coded as cognitive presence – integration phase.

Another facilitating discourse indicator in the student discussions that was present primarily in the beginning of the course was setting the climate for learning (TP-FD-4). Found only in Group A, these posts occurred in Module 1 (*f* = 6) and Module 2 (*f* = 1).

While these were primarily expressing the participant's personal expectations for the course, they also conveyed a positive sense of enthusiasm for her peers and the course itself. Therefore the post was helping to shape the thoughts and attitudes of the group itself. One student described the students she teaches and concluded, "I am very excited to continue my journey of learning how I can help them. I am very excited to work with all of you this semester."

The facilitating discourse indicator of prompting discussion (TP-FD-5) was also present in both groups, with six posts in Group A and one in Group B. While some of these posts were in the form of direct questions, others were in the form of statements, but with a clear invitation for others to respond. For example, one student wrote, "This is a difficult concept for my parents to grasp, and I am curious to know how others have approached parents concerning this matter." The posts coded as prompting discussion also varied in their focus, from the theoretical to the very practical. One student attempted to engage her peers philosophically when she asked, "Looking at all those approaches on Literacy – which approach are you? What do you aspire to? What have you practiced?" Another sought advice on complex educational situations, such as how to educate administrators and colleagues on diversity and the needs of English Language Learners (ELLs). The majority of the posts coded as prompting discussion, however, were aimed at very concrete practical matters. Some solicited suggestions for resources such as culturally relevant books, an online translation program or sources for grants. Another sought to clarify something that had come up in another post (i.e., understanding a legislative issue). Five of the seven posts exhibiting this indicator occurred in Modules 6 and 7. Of these, four appeared during the sixth calendar week of the course (one in Module 6 and three in Module 7). These four posts were all very

practical and concrete, asking for resources related to the topic. At the beginning of this week, the assignment (described further in Research Question 2c.) that required students to apply what they had been learning to a practical situation was due. In addition, the readings for this week focused on practical strategies for teachers working with ELL students. The post that occurred in both calendar Week 7 and Module 7 was more philosophical in nature. The readings for this module were also directed at practical application, specifically interventions for ELL students, but included theoretical information on various approaches to literacy. In this post (quoted above) the student asked for feedback from her peers on which approach they currently practice and which approach they would like to embrace. Because the researcher could only view posts from study participants, it could not be determined how many of the seven posts coded as prompting discussion actually generated peer responses, but only three of these posts (two in Group A and one in Group B) generated a response from another study participant.

As described in Chapter 3, when students shared experiences, the post could have fit any of several codes. Three posts in Group A fit the teaching presence – facilitating discourse category with the indicator of sharing experience (TP-FD-7). There were no posts in Group B fitting this indicator. These posts occurred throughout the course and were primarily in response to a personal query by another student. For example, one student had been a presenter at a conference and shared details on the name of the conference as well as her presentation. Another student shared details about a conference she had attended. Each of the posts was simply sharing the experience without a clear connection to the discussion prompt.

Only one post (in Group A, Week 1) was coded as identifying areas of agreement or disagreement (TP-FD-1). This was a student who compared her personal background to that

of a peer. The post was connected to her experiences with diversity and similarities in teaching assignments but was not clearly part of the cognitive presence process of exploring those issues.

For teaching presence, the facilitating discourse indicators that were not present in either group included seeking to reach consensus (TP-FD-2) and assessing the discussion process (TP-FD-6). Although not all students enrolled in the classes participated in the study and the coders did not have all the posts for the class sections, in those that were reviewed there was little evidence of division or misunderstanding (resulting in a need for reaching consensus) and no evidence of students getting off task in their discussions (resulting in a need for assessing the process).

Direct instruction indicators. Only one indicator in the teaching presence category of direct instruction was present, injecting knowledge from diverse sources (TP-DI-6), with four posts in Group A and three posts in Group B. All of these posts occurred in the first four modules of the course. Each of these posts shared a specific resource with peers that further illuminated the topic. One student shared a link to an article she had read on the topic and another shared a link to a book. The title of a movie that "just personifies these types of language and cultural clashes" was shared by another student. Other sources were directly connected to students' experiences in their classrooms, such as the name and description of a program one student found helpful or a survey another had developed for use with parents.

Design and organization indicators. The only indicator present in the student discussions in the design and organization category was aimed at using the medium effectively (TP-DE-4). This occurred in Group A during Week 1 and was found in the course café. The post responded to a question by another participant about whether it was necessary

for students to attach a document verifying authorship of material (required for all assignments submitted in the program). While the response could have been coded in the direct instruction category as "responding to technical concerns" (TP-DI-7), the emphasis of the response was on how to use the discussion board effectively to make posts "easier to read and respond to as 'discussions' if you don't have to open files and look down pages," thus more appropriately fitting the indicator of using the medium effectively (TP-DE-4).

RQ 1b. What Patterns of Instructor Teaching Presence Develop in the Discussion Forum?

The two instructors had very different types of interaction in the discussion board forum. For content-related issues, Instructor A responded to individual students in the public discussion forum, allowing all students to see the response. With the exception of one post, he reserved issues related to grading (e.g., number of posts per week, length of posts) for the grading feedback function of Blackboard so that only that individual student would see it. In contrast, Instructor B used the grading feedback function to create a "teachable moment" to teach concepts "at the same time through [my] feedback." He explained:

> The reason that this is so important for me in an online course is because every student's reflection is completely unique…. if I find out during the students' reflection that the students have not understood [the concept], I go in and teach it again through the feedback individually…. [It] is like picking up on some of the main things that the students are struggling with in the class and trying to explain it to them.

As a result of this difference in approach, Instructor A posted in the public discussion board forum 136 times throughout the course and Instructor B posted only a single introductory statement in Module 1. Because the CoI framework stresses the importance of communication within the community environment, this section only focuses on the content in the public discussion board forum. This includes both the discussion prompts and the

instructor posts within the forums. The feedback posts that both instructors gave privately to individual students are discussed in Research Question 1c.

Instructor Teaching Presence Categories Over Time

As seen in Table 8, Instructor A was much more active in the discussion board than Instructor B. While Instructor B posted only one time in the discussion forums, Instructor A posted 136 times, an average of 17 posts per module with 17 students enrolled. As Figure 4 shows, most of Instructor A's posts were in the direct instruction category, followed by facilitating discourse. The facilitating discourse category was highest at the beginning of the course, with all posts in the discussion board forum for Module 1 categorized as facilitating discourse. Module 2 also had strong evidence of facilitating discourse as students and instructor continued to get to know one another. However, the introduction of course content in this module led to an equally high level of direct instruction. The higher levels of direct instruction continued until Module 8 when the levels of facilitating discourse and direct instruction were again nearly equal. The discussion board was not used for design and organization issues. As a result both instructors had one post each week (i.e., the discussion prompt) categorized as design and organization.

Both instructors used identical prompts for each of discussion modules. The first module had a prompt that invited students' personal introductions, and the last seven modules had an identical prompt for each week. Looking at the posts over time throughout the course, this prompt was counted each time it was posted. All discussion board prompts had only indicators of design and organization and were coded in that category (*f* = 8 for each instructor).

Table 8

Number of Instructor Teaching Presence Prompts and Posts by Category in Discussion Board

Category	Module									Total
	1	2	3	4	5	6	7	8	café	
Instructor A										
Design and Organization	1 (5.00)	1 (5.88)	1 (5.56)	1 (5.56)	1 (5.88)	1 (5.88)	1 (5.56)	2 (10.53)	0 (0.00)	9 (6.25)
Direct Instruction	0 (0.00)	8 (47.06)	11 (61.11)	16 (88.89)	12 (70.59)	9 (52.94)	11 (61.11)	8 (42.11)	0 (0.00)	75 (52.08)
Facilitating Discourse	19 (95.00)	8 (47.06)	6 (33.33)	1 (5.56)	4 (23.53)	7 (41.18)	6 (33.33)	9 (47.37)	0 (0.00)	60 (41.67)
No teaching presence	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Total	20 (100.00)	17 (100.00)	18 (100.00)	18 (100.00)	17 (100.00)	17 (100.00)	18 (100.00)	19 (100.00)	0 (100.00)	144 (100.00)

Table continued on next page

Table 8 cont. from previous page

Instructor B										
Design and Organization	1 (50.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	0 (0.00)	8 (88.89)
Direct Instruction	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Facilitating Discourse	1 (50.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.00)
No teaching presence	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (11.11)
Total	2 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	1 (100.00)	0 (100.00)	9 (100.00)

Note. Numbers in parentheses are the percentage within the module. No teaching presence = posts with no teaching presence indicator observed; café = a forum in the discussion board for non-content related discussion (e.g. discussing a course assignment, asking about a professional resource, or sharing personal interests).

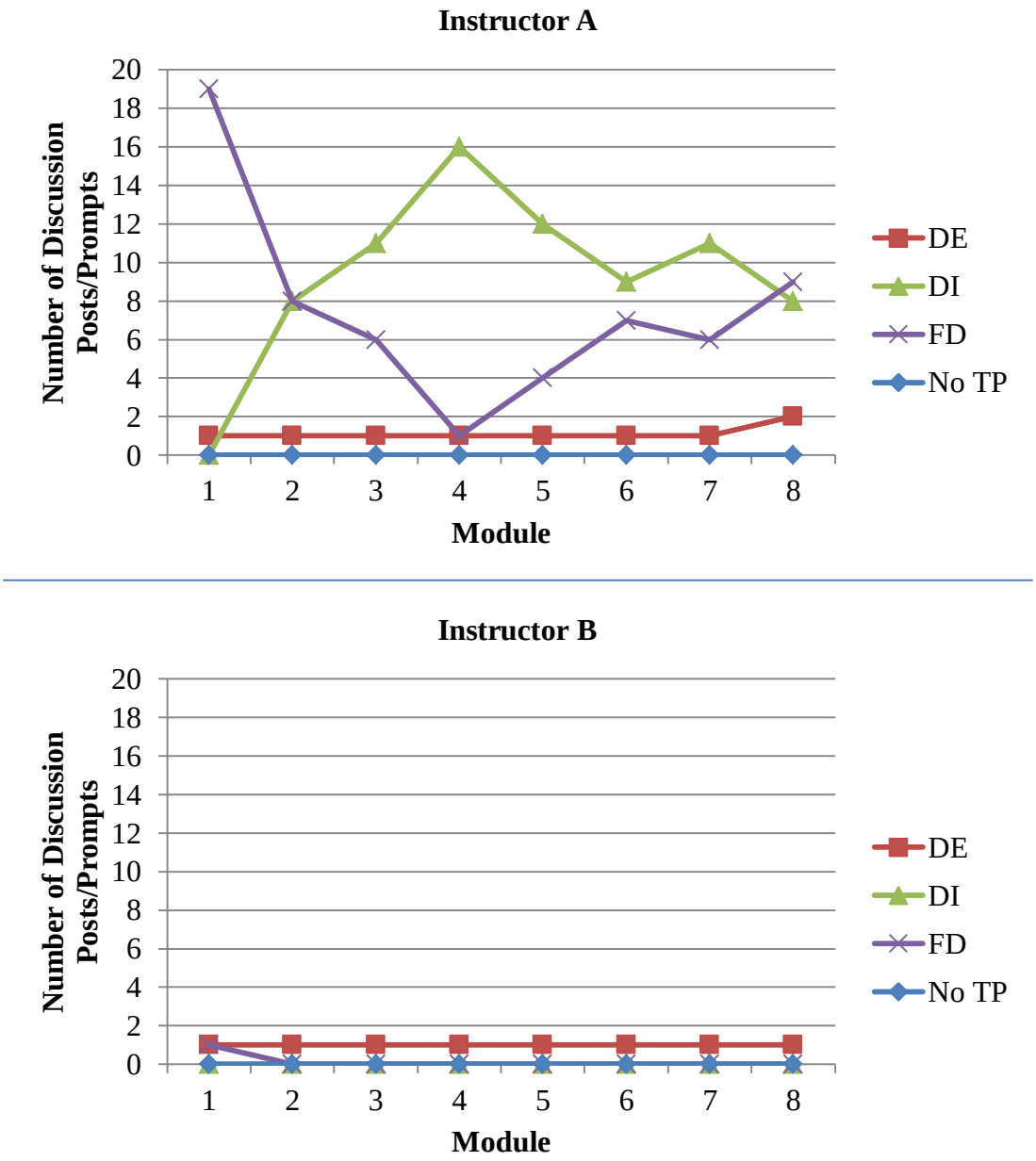

Figure 4. Instructor teaching presence in the discussion board.
Note. DE = Design and organization; DI = Direct Instruction; FD = Facilitating Discourse; No TP = posts with no indicator(s) of teaching presence observed.

Within the threads of the discussion board forum, Instructor B posted one time, his personal introduction in Module 1. While this post had one indicator of designing methods for course communication (TP-DE-2), its primary focus was facilitating discourse and was coded in that category. In this post, the instructor set the climate for learning (TP-FD-4), but the post primarily shared experiences (TP-FD-7).

Instructor A did not post during Week 1, but on Monday of Week 2 he posted 17 responses to students within the Module 1 forum, with two additional responses on Tuesday. Because the students' initial post was due on Monday and peer responses were due by Friday, the instructor was responding to both initial and response posts of students from the previous week. This pattern continued throughout the course, with the instructor posting responses early in the calendar week to the previous week's discussion forum. In Table 8 and Figure 4 the posts and discussion prompts for each instructor are reported according to the module in which they appeared. In doing so, Instructor A's posts of response to students are shown in the context in which they appeared, and in the same location as the student posts to which he was responding.

While coding was done at the message level with each post assigned to only one category, it is important to note that Instructor A's style of including phrases of reinforcement in each post as well as responding to multiple students in one post made many posts difficult to code into one *primary* category. Individual indicators were almost equally distributed between facilitating discourse and direct instruction. Of the 136 discussion board posts, 38 were clearly facilitating discourse with only indicators in that category. Direct instruction indicators were the only category present for 33 other posts. But 63 posts had at least one indicator from each of these categories and another post had both facilitating discourse and

design and organization indicators. The remaining post had no teaching presence indicators.

The strong presence of facilitating discourse indicators is due in part to the instructor's encouraging nature with students. Every post included some type of reinforcement of the student's post. While some (*f* = 37) were of an assessment nature (e.g., "I think you're right, [Karen]") and included explanatory feedback (TP-DI-4), most (*f* = 99) were just encouragement or acknowledging the contribution (e.g., "How lovely to see such a passionate response to the readings, [Lisa]"), a facilitating discourse indicator (TP-FD-3).

The presence of multiple categories also occurred because the instructor included multiple students in his response. Each week, he posted in each student's thread for that forum. Since the first module's forum was focused on individual student introductions and only two students responded to peers' posts in that forum, Instructor A's posts in this forum only addressed the original post. In subsequent weeks, because other students had already responded, the instructor's post addressed the original post while incorporating points from some of the peer responses. In some of his posts, this was in the form of summarizing or comparing and contrasting students' ideas (TP-DI-4). In many other posts, references were made to multiple students' posts, but they were not integrated. These posts often demonstrated the indicator of acknowledging or reinforcing student contributions (TP-FD-3), but it was not the primary focus of the post. For example, one post read:

> You are very right, [Ashley], about the fact that there is hope for languages that seem to be dying, or even dead. Hebrew was very successfully revitalized, and Welsh and Gaelic have been brought back from the brink as well. Hopefully your Kindergartner will start speaking his family language, [Maria]. [Jane], I love the English is Walmart analogy! I am sad to see the mom and pop stores disappear also….

This post demonstrates direct instruction (TP-DI-4) by confirming understanding through assessment (i.e., "you are very right…") and explanatory feedback (i.e., "Hebrew was

very…"). The comment addressed to Maria could be viewed as further expounding on the idea of preserving languages (TP-DI-4), but without an articulation of connection of ideas, it could also be viewed as just acknowledging or reinforcing the student's contribution (TP-FD-3). Likewise, the final idea, addressed to Jane, acknowledges and reinforces her contribution followed by briefly sharing an opinion on the topic. Since coding was done at the message level, this post was deemed to focus primarily on direct instruction and was coded as such. Of the 63 posts where both direct instruction and facilitating discourse indicators were present, this type of acknowledgement and reinforcement was the only facilitating discourse indicator for 41 of the posts.

Instructor Teaching Presence Indicator Patterns Over Time

Of the 20 teaching presence indicators, 11 were demonstrated by Instructor A as the primary indicator for the post and 3 by Instructor B (Table 9). A description is provided here of each indicator's use, along with examples.

Facilitating discourse indicators. The predominant facilitating discourse indicator present for Instructor A was that of encouraging, acknowledging, or reinforcing student contributions (TP-FD-3). Of the 136 discussion board posts, 49 were coded as primarily this indicator. As this post demonstrates, many of these posts acknowledged the student's contribution with a qualitative statement (e.g., "wonderful") followed by a statement of opinion about its content,

> Wonderful post, [Angela] – both the consideration of where your academic language is less complete and the reflections on your husband's family's shift in dialect. I'm so glad….

Table 9

Instructor Discussion Board Posts and Prompts – Primary Indicator

Category and Indicator	Code	Instructor	
		A	B
Design and Organization (DE)			
Setting curriculum	TP-DE-1	0	0
Designing methods	TP-DE-2	1	1
Establishing time parameters	TP-DE-3	1	0
Utilizing medium effectively	TP-DE-4	7	7
Establishing netiquette	TP-DE-5	0	0
Making macro-level comments about course content	TP-DE-6	0	0
Facilitating Discourse (FD)			
Identifying areas of agreement/disagreement	TP-FD-1	2	0
Seeking to reach consensus	TP-FD-2	0	0
Encouraging, acknowledging, or reinforcing student contributions	TP-FD-3	49	0
Setting climate for learning	TP-FD-4	0	0
Drawing in participants, prompting discussion	TP-FD-5	3	0
Assessing the efficacy of the process	TP-FD-6	0	0
Sharing experience	TP-FD-7	4	1
Direct Instruction (DI)			
Present content/questions	TP-DI-1	0	0
Focus the discussion on specific issues	TP-DI-2	0	0
Summarize the discussion	TP-DI-3	14	0
Confirm understanding through assessment and explanatory feedback	TP-DI-4	29	0
Diagnose misconceptions	TP-DI-5	2	0
Inject knowledge from diverse sources (e.g., textbook, articles, internet, personal experience). Includes pointers to resources	TP-DI-6	4	0
Responding to technical concerns	TP-DI-7	0	0
No teaching presence observed		1	0
Total		144	9

Note. Only the primary indicator present in the post is recorded in this table. Although some posts had more than one indicator, the one representing the implied primary intent of the post, the lengthiest portion of the post, and/or the most detail is included here. TP = Teaching Presence, DE = Direct Instruction, FD = Facilitating Discourse, DI = Direct Instruction. Codes represent the presence followed by the category and indicator (e.g., TP-DI-1 = Teaching Presence – Direct Instruction – indicator #1). Coding scheme adapted from "Assessing teaching presence in a computer conferencing context," by T. Anderson, L. Rourke, D.R. Garrison, and W. Archer, 2001, *Journal of Asynchronous Learning Networks, 5*(2), p. 6-10.

Other posts acknowledged a student's contribution followed by a statement of encouragement to her in her role as a teacher, parent, or family member:

> I agree with [Lisa] – what a wonderful thing you plan to do for your children, [Ebony]! … It is amazing what children can do with multiple languages at a young age, [Susan]; I'm so glad you were encouraging of that father's efforts.

This post also demonstrates how the instructor addressed multiple students in the same post. In this example the instructor is acknowledging and reinforcing the contribution of three different students but in a manner of reaction or expressing opinion. Other posts that acknowledged or reinforced student contributions by referencing them in the post were primarily for the purpose of pointing out agreement or disagreement between students (TP-FD-1), prompting discussion (TP-FD-5), summarizing the discussion (TP-DI-3), or assessing understanding and providing explanatory feedback (TP-DI-4).

The strongest presence of facilitating discourse by acknowledging student contributions (TP-FD-3) occurred in Module 1 forum, due primarily to the nature of the assignment for that forum requiring personal introductions. The instructor's responses, therefore, were focused on acknowledging the student contributions and making connections to their content, usually through a greeting and reactionary type statement. For example, one post read, "Hi [Ebony], I remember your unique job and role! I would love to visit your hometown…." This kind of acknowledgement was present in 15 of the 19 posts in Module 1. With the exception of Module 8, each of the following modules also had posts focused primarily on acknowledging or reinforcing, ranging from one post (Module 4) to six posts (Modules 2 and 7).

Both instructors had a post that shared personal experience(s) for the purpose of facilitating discourse (TP-FD-7). All of these occurred in the first half of the course, with

Instructor A posting a total of four of these posts (three in Module 1 and one in Module 3) and Instructor B posting one in Module 1. The majority of these posts were part of the forum for personal introductions (Module 1). Instructor A posted in response to student posts, sharing experiences that were similar to the ones students had shared (e.g., living in the same foreign country) or related to a comment the student had made (e.g., sharing how his daughter's name was chosen when a student noted the unusual name). While Instructor A's introduction was sent out by email and, therefore, unavailable to the researcher, Instructor B posted his introduction in the discussion forum. Posted in Module 1, this post included a description of his personal language background, his family, and hobbies. A large portion of his post was describing his personal experiences as a student.

In Module 2, Instructor A also had two posts identifying areas of agreement between students (TP-FD-1). These were in response to a thread in which other students had already responded to the original post and the instructor pointed out where students agreed. In both posts the instructor added his own agreement (e.g., "Like [Ashley] and [Karen], I am impressed with the responsiveness of your school administration"). However, the topic of agreement was in an emotional context (e.g., "I agree with [Angela], I'm sad and surprised that…") versus an intellectual (e.g., "I think" or "I believe") one.

Instructor A also had three posts (*f* = 1 each in Modules 1, 5, and 6) that were primarily drawing in participants or prompting discussion (TP-FD-5). While there were 11 posts that asked direct questions, eight of these posts had another primary indicator with the question merely playing a rhetorical role, serving as sarcasm, posing a suggestion with a "?" at the end of the statement, or asking for the student to elaborate on a point. For example, the post "I'm sorry to hear that your schools are struggling with providing language learners what

they need (and all students, it sounds like – 60 students in one classroom?)" was summarizing the discussion (TP-DI-3) and acknowledging student contributions (TP-FD-3) with the question just serving rhetorically to illustrate a point. Each post that was coded as primarily serving to prompt discussion (TP-FD-5) included direct questions asking the student to respond, usually elaborating on a point she had made in her post. One of these posts asked the student to provide a link to the resource she had mentioned. In the other two posts, the question was the culminating point of the text but could have been answered with a "yes" or "no." For example, one post made a statement about the "melting away" that occurs in the U.S. of immigrants' language and culture, culminating in asking the student if there was anyone in her family she could ask about her ancestors' experiences immigrating to the U.S.

Direct instruction indicators. Posts with a primary direct instruction indicator began in Module 2 with an equal percentage (47.06%) as facilitating discourse posts. Beginning in Module 3 the percentage of Instructor A's posts that were in the direct instruction category exceeded the percentage of facilitating discourse posts in every module except Module 8.

The most frequent direct instruction indicator was injecting knowledge from various sources (TP-DI-6). With 31 occurrences, this indicator was the primary indicator in the direct instruction category for three of the eight modules, and the primary overall indicator for two modules. An average of 3.9 posts per module served primarily to inject knowledge, ranging from two posts in Modules 2 and 8 to seven posts in Module 4. Most of the posts sharing knowledge contained his general expertise on the subject matter. This includes statements about what "research shows," things "I've heard," historical background on the issue, and information on related legislative issues. Two of the posts elaborated on textbook content by adding additional background information, and two posts introduced and defined a new

vocabulary concept. Three additional posts added other resources, such as a link to an online lecture, the name of an author of a related book and a classroom activity students could use.

Another frequent direct instruction indicator was confirming understanding through assessment and explanatory feedback (TP-DI-4), with a total of 29 posts. This was particularly present in Modules 2 through 4 (*f* = 6, 7, 6, respectively), with three posts in each of Modules 5 and 7 and two posts in each of Modules 7 and 9. These posts generally included a statement of assessment, such as "[Ebony] makes a good point…. [Angela] gives some excellent suggestions here…" followed by more detail or a pointer to a resource. All of these statements were pointing out the student's correct understanding (e.g., "I think you're right on, [Lisa]," "You are very right, [Karen]") or contribution of a "good point."

Two posts pointed out misconceptions and clarified the material for the students (TP-DI-5). These posts occurred at the end of the course, in Modules 6 and 8. One of these posts clarified both a misunderstanding about the reading as well as a misunderstanding that had occurred as a result of a student post:

> Sorry [the article] was hard to get through! He was strongly disagreeing with the attitudes about… while trying acknowledge [*sic*] that such viewpoints were totally normal in that context. Similarly, [Jane's] comment about… was presenting a view she strongly critiqued….

Another post corrected a student's use of vocabulary while at the same time acknowledging a correct response by another student, "Susan, I understood you to mean recasting, as [Ashley] suggests, rather than overt correction…."

The final direct instruction indicator present for the instructors in the discussion board forum was Instructor A's use of summarizing the discussion (TP-DI-3). These posts all occurred in the second half of the class, with a total of 14 posts in Modules 4 through 8. This

was sometimes a general statement such as "I'm so glad that so many of you are finding the theoretical work of (the author) so useful." Other posts included a direct statement of the "theme in this thread," while others stated a more specific summary of the group's discussion and further explanation of the topic, as seen in the post:

> Excellent topic and a thoughtful analysis! I am very impressed with all of you for your intuitive grasp of what is a fundamental truth of linguistics: ... [any] nonstandard dialect is a complex, cohesive, rule-bound language system that is every bit as valid as standard English.

Design and organization indicators. This category was primarily present in the discussion prompts, with only one post in the discussion threads (posted by Instructor A) containing a design and organization indicator. The prompts were identical in both class sections. The prompt for the first module invited students to post a "reflection" on those people and experiences that had influenced their language development. Students were also asked to share some personal information, such as their present motivations and ambitions. The prompt concluded with a clear statement that the purpose of the task was to get to know each other as well as for students to look back on their personal acquisition of both oral and written language. This prompt was primarily focused on designing methods (TP-DE-2), but also made macro-level comments about course content (TP-DE-6). The prompt for modules two through eight was identical for each week. For each of these modules students read two to three chapters in the textbook along with one journal article. They were then to post a response of at least 250 words reflecting on the issues brought up in the readings. This reflected the indicator of designing methods (TP-DE-2). However, the prompt primarily focused on how to utilize the medium effectively (TP-DE-4). It specifically encouraged students to reach the cognitive presence integration phase by directing them to demonstrate

"critical, personal engagement" with the issues by "grappl[ing] with [them] on both an intellectual and a practical level…. [and] to incorporate reflections on where your own life experiences intersect with these topics." It further directed the student to be selective about the content to which they would respond to have a more focused response.

Instructor A had one post that was categorized as design and organization, specifically reflecting the establishment of time parameters (TP-DE-3). While most of his examples of this indicator were in the announcements and grading feedback portions of the course, this final post in the discussion board (a full week after the end of the course) was posted in the public discussion forum. While it could have been coded as not fitting any of the categories but more appropriately called feedback, it was coded as establishing time parameters due to its public nature. The post acknowledged a late post by a student and reinforced the established parameters by pointing out that the student would not receive credit for it since course grades had already been submitted to the registrar.

RQ 1c. What Patterns of Instructor Teaching Presence as Demonstrated by Multiple Data Sources Develop in the Course?

While both class sections had the same structure with the same syllabus, discussion prompts, and assignment instructions, there were two important differences in the way the instructors utilized the Blackboard course management system. Instructor A used the discussion board threads to respond to student discussion posts, while Instructor B used the feedback portion of the gradebook tool. For class management issues, Instructor A used the course announcement tool while Instructor B used emails. Due to this complexity, a description is provided here of teaching presence for the instructors outside of the discussion

forums as well as overall teaching presence. It is important to note, however, that emails and other personal communication (e.g., phone calls) between the student and instructor are not included in this summary, so it is still not a complete picture of each instructor's activity. This especially impacts any comparison in the use of announcements since Instructor B used emails to respond to class organizational issues "when everybody [was] asking the same thing in a different way… [such as] when there was a little conflict with the syllabus online and the assignment section."

Patterns of Overall Instructor Teaching Presence Over Time

A cross-classification analysis that included all instructor content (i.e., announcements, assignment instructions, discussion board, discussion board feedback, discussion board prompts, project feedback, and syllabus) revealed several patterns of overall teaching presence (Figure 5) similar to the discussion board patterns. First, Instructor A was much more active than Instructor B throughout the course, with 3.10 times more posts/thematic units in the combined content. While the instructors had the same total number of posts in Week 1, the content was primarily from the course template (f = 15 of the 16 posts/thematic units). In the remaining weeks, Instructor A had at least twice as many posts as Instructor B, with a median of 3.4 times more posts/thematic units. A second pattern mirroring the instructors' discussion board activity was the shift between two different prominent categories between Weeks 1 and 2. While the discussion board primarily had facilitating discourse posts in Module 1 followed by increased direct instruction in Module 2, the primary category when considering all data sources was design and organization. For Instructor A, the shift between categories in subsequent weeks mimicked his pattern in the

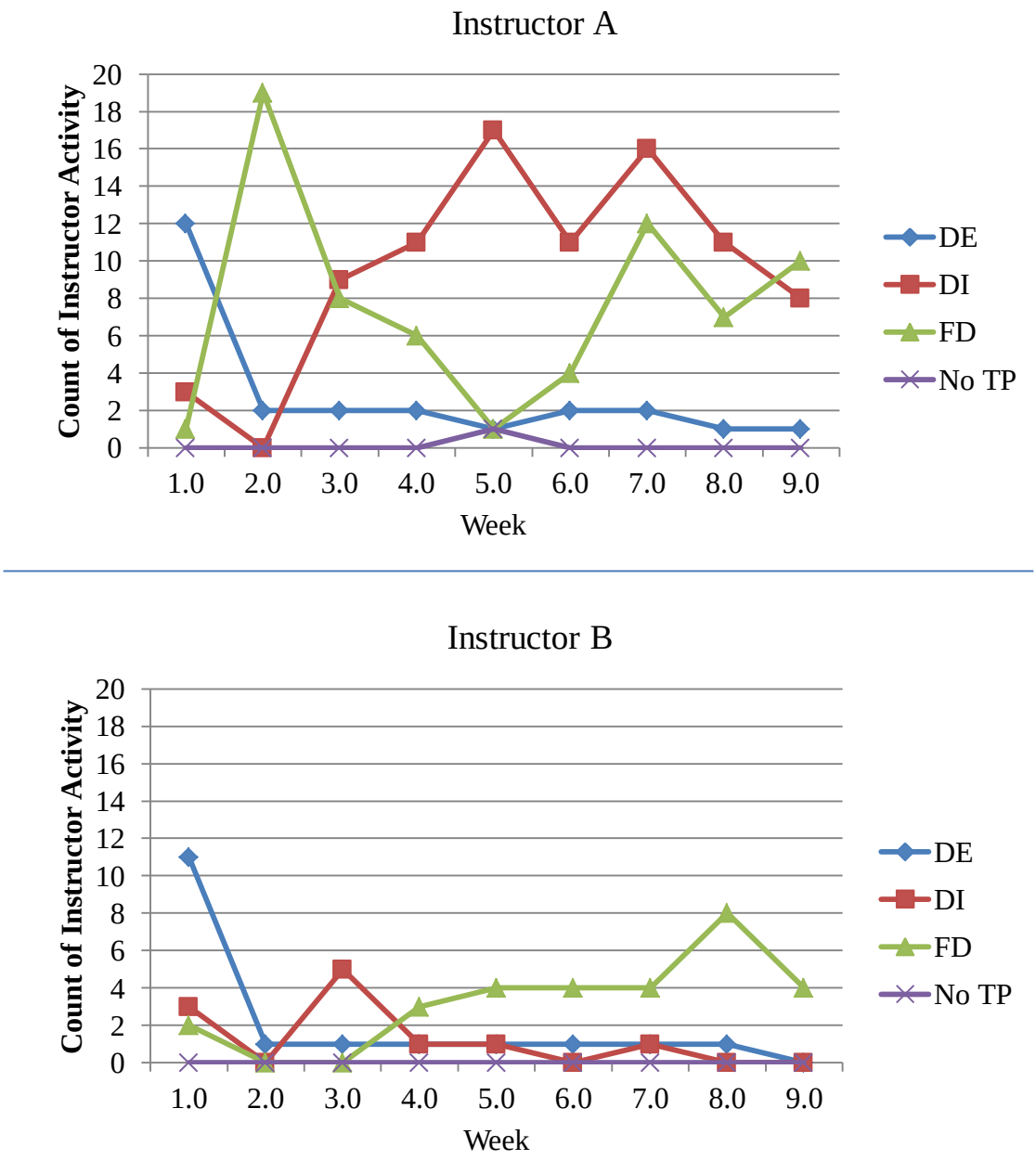

Figure 5. Instructor teaching presence by category with all data sources.
Note. "All data sources" = syllabus, discussion board, discussion board prompts, discussion board feedback, announcements, assignment instructions, and project feedback. Each item was counted in the week in which it first appeared in Blackboard. Week 9 is instructor activity posted after the course ended (i.e., during grading week). DE = Design and Organization; DI = Direct Instruction; FD = Facilitating Discourse; No TP = posts/thematic units with no indicator(s) of teaching presence observed.

discussion board (i.e., primarily facilitating discourse in Week 2 [discussion Module 1], equal facilitating discourse and direct instruction in Week 3 [Module 2], followed by primarily direct instruction the remainder of the course). However, due to Instructor B's inactivity in the public discussion board, his pattern of content type differed from the discussion board data. Like Instructor A, his content for Week 1 primarily consisted of course template materials (i.e., syllabus and a discussion prompt). With only the discussion prompt posted during Week 2, his content shifted in Week 3 to direct instruction posts from the discussion board feedback. For the remainder of the course most of his content was in the facilitating discourse category.

Instructor Teaching Presence by Data Source

The frequency of posts/thematic units exhibiting each category of instructor teaching presence in each data source (i.e., syllabus, discussion board, discussion board prompts, discussion board feedback, announcements, assignment instructions, and project feedback) are summarized in Table 10. The grading feedback posts for the projects were weighted to adjust for the difference in group sizes. Because Group A had eight students and therefore the instructor had eight opportunities to respond to papers and Instructor B only had four, Instructor A's project feedback posts were weighted by 0.5 (with the actual frequencies shown in brackets).

Nearly half of Instructor A's teaching presence was in direct instruction (47.73%). Facilitating discourse cases made up 37.50% and design and organization accounted for 14.20% of Instructor A's content. Only one contribution (0.57%) had no indicators of teaching presence. Instructor B's participation was primarily in facilitating discourse

Table 10

Instructor Teaching Presence in Multiple Data Sources

Data Location	Category: Design and Organization *f*	% [1]	% [2] DE	Direct Instruction *f*	% [1]	% [2] DI	Facilitating Discourse *f*	% [1]	% [2] FD	No TP observed *f*	% [1]	% [2] No TP	Total *f*	% [1]	% [2] of category
Instructor A															
Syllabus	10	(71.43)	(40.00)	3	(21.43)	(3.57)	1	(7.14)	(1.52)	0	(0.00)	(0.00)	14	(100.00)	(7.95)
Discussion board	1	(0.74)	(4.00)	75	(55.15)	(89.29)	60	(44.12)	(90.91)	0	(0.00)	(0.00)	136	(100.00)	(77.27)
Discussion board prompts	8	(100.00)	(32.00)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	8	(100.00)	(4.55)
Discussion board feedback	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(100.00)	(0.00)
Announce-ments	6	(54.55)	(24.00)	1	(9.09)	(1.19)	3	(27.27)	(4.55)	1	(9.09)	(100.00)	11	(100.00)	(6.25)
Assignment instructions	0	(0.00)	(0.00)	3	(100.00)	(3.57)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	3	(100.00)	(1.70)
Project feedback	0	(0.00)	(0.00)	2 [4] [3]	(50.00)	(2.38)	2 [4] [3]	(50.00)	(3.03)	0	(0.00)	(0.00)	4 [8] [3]	(100.00)	(2.27)
Total	25	(14.20)	(100.00)	84 [3] [86]	(47.73)	(100.00)	66 [3] [68]	(37.50)	(100.00)	1	(0.59)	(100.00)	176 [180] [3]	(100.00)	(100.00)

Table continued on next page

Table 10 cont. from previous page

Instructor B														
Syllabus	10	(71.43)	(55.56)	3	(21.43)	(27.27)	1	(7.14)	(3.45)	0	(0.00)	(0.00)	14	(100.00)	24.14
Discussion board	0	(0.00)	(0.00)	0	(0.00)	(0.00)	1	(100.00)	(3.45)	0	(0.00)	(0.00)	1	(100.00)	(1.72)
Discussion board prompt	8	(100.00)	(44.44)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	8	(100.00)	(13.79)
Discussion board feedback	0	(0.00)	(0.00)	5	(17.86)	(45.45)	23	(82.14)	(79.31)	0	(0.00)	(0.00)	28	(100.00)	(48.28)
Announce-ments	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	0	(100.00)	(0.00)
Assignment instructions	0	(0.00)	(0.00)	3	(100.00)	(27.27)	0	(0.00)	(0.00)	0	(0.00)	(0.00)	3	(100.00)	(5.17)
Project feedback	0	(0.00)	(0.00)	0	(0.00)	(0.00)	4	(100.00)	(13.79)	0	(0.00)	(0.00)	4	(100.00)	(6.90)
Total	18	(31.03)	(100.00)	11	(18.97)	(100.00)	29	(50.00)	(100.00)	0	(0.00)	(100.00)	58	(100.00)	(100.00)

Note. All percentages for Instructor A are based on the weighted total (see note 3).

1. Numbers in parentheses in second column represent the percentage of posts/thematic units for that data source exhibiting that category.
2. Numbers in parentheses in third column represent the percentage of posts/thematic units in the category as a whole.
3. Because only the feedback for course participants was available to the researcher and the post was only seen by the individual student, Instructor A's frequency count for project feedback was weighted to account for the difference in group sizes. Group A had eight students while Group B had only four. Therefore, Instructor A's feedback was reduced by ½ (actual frequencies are found in brackets). The percentages are based on the weighted frequency.

(48.28%), followed by design and organization (31.03%) and direct instruction (18.97%). He also had one contribution (1.72%) with no teaching presence indicators. A brief summary of the content from each data source outside of the discussion board is provided in this section.

Syllabus. Both instructors used the university template syllabus without modifications, so students in both class sections were presented with an identical summary of course content and expectations. Coded at the thematic level, 14 themes were present. Table 11 presents a summary of these themes, indicators, and the primary teaching presence category of each theme. Because some themes were woven throughout the syllabus, those indicators that were the primary foci in each theme are highlighted in bold. For example, establishing time parameters (TP-DE-3) was the primary indicator in the calendar/due dates theme. However, due dates were a supporting detail in the description of methods for each individual assignment (i.e., discussion board, video, critique, philosophy statement) in the assignment section and were also referenced in both the grading and participation themes. Therefore, the indicator TP-DE-3 appears in the table as a part of those themes, but is not highlighted as the primary indicator.

The most prevalent teaching presence category in the syllabus was design and organization. This was the primary focus in 10 themes and a secondary focus in the remaining four. Direct instruction was the primary focus in four themes, with two other themes each having a secondary reference to direct instruction details. A facilitating discourse indicator was a primary focus in one theme and a supporting focus in two others.

Several themes in the syllabus were primarily focused on setting curriculum (TP-DE-1). These went from a broad view (i.e., stating the course objectives) to a more specific listing of the units in the course to very specific descriptions of the materials (i.e., text and

Table 11

Syllabus Coding by Thematic Units

Theme	Indicators present	Primary TP Category FD	DI	DE
Course's relationship to mission of the university and department	**TP-DE-6**			✓
Ethical considerations	TP-DE-2, TP-DE-5, **TP-FD-4**	✓		
Attendance and participation	**TP-DE-2**, TP-DE-3, TP-FD-4			✓
Course structure	**TP-DE-2**			✓
Technology Expectations	**TP-DE-2**			✓
Calendar/due dates	TP-DE-1, **TP-DE-3**			✓
Course objectives	**TP-DE-1**			✓
Curriculum – course units	**TP-DE-1**			✓
Curriculum – materials	**TP-DE-1,** TP-DE-2, TP-DI-1			✓
Grading	**TP-DE-2**, TP-DE-3, TP-DI-1			✓
Discussion Board expectations	**TP-DE-2**, TP-DE-3, **TP-DE-4**, **TP-DE-6**, TP-FD-4, **TP-DI-1**			✓
Video assignment	**TP-DE-2**, TP-DE-3, **TP-DI-1**		✓	
Critique assignment	TP-DE-2, TP-DE-3, **TP-DI-1**		✓	
Philosophy statement assignment	TP-DE-2, TP-DE-3, **TP-DI-1**		✓	

Note. Codes in bold print are those that were considered the prominent indicator in that theme. TP = Teaching Presence; FD = Facilitating Discourse; DI = Direct Instruction; DE = Design and Organization.

journal articles) that would be used. While not its primary focus, the calendar theme also stated the curriculum details and added information about the sequence of the curriculum.

The most prevalent indicator in the syllabus, present in 10 themes, was designing methods (TP-DE-2). While in some themes the methods were only a supporting detail, establishing and describing the methods was the primary indicator in six of the themes. This included a description of what constitutes "attendance" in the online course and methods for communicating absences to the instructor in the attendance theme. In the structure and technology themes students were informed of the methods they would use to complete the activities, including what technology they would use to complete research and communicate with others as well as the organization of the course and the activities it would include. The grading theme included grading methods (i.e., point values for each assignment, grading scale, and penalties for late assignments) and methods for requesting and resolving incompletes. The assignment descriptions most heavily focusing on the methods for completing the assignment were the discussion board and the video assignment. The discussion board theme included information on method details such as the number of words per post, frequency of posting, and types of content to include. The video assignment listed a three-step procedure for completing the assignment as well as details on the number of pages and expectations for content. While the other two assignments (i.e., critique and philosophy statement) included similar elements of the designing methods indicator, they were only secondary and short details in support of the theme's main focus. The content/readings theme, while primarily defining the curriculum, also referenced the method for using the materials (e.g., "All assigned readings for the module are to be completed before completing assignments. After completing the assigned readings…."). Finally, the ethical considerations

theme included information on the method students would use to submit their assignments with their digital signature to signify their authorship. It also included a description of the method instructors would use to detect plagiarism.

Another indicator present throughout the syllabus (seven themes) was that of establishing time parameters (TP-DE-3). While only the primary indicator for the calendar/due dates theme, the time parameters for submitting assignments were stated again in each assignment description. Time parameters were also a supporting detail in the attendance and participation theme as the expectations were presented for the number of days per week in which students should be engaged and due dates were referenced. While its primary focus was on methods, the grading theme also had indicators of establishing time parameters as it described penalties for being absent "25% or more of the designated instructional time," penalties for late postings to the discussion board, and the amount of time allowed for completing coursework when an incomplete has been granted.

Only one theme had utilizing the medium effectively (TP-DE-4) as its primary focus. The descriptions of discussion board activity, having three indicators as primary foci, included examples of things an effective post might include, such as asking a probing question, seeking clarification, or validating an idea with a personal experience. It also assured students that they did not need to respond to everything in the readings but should use the post to reflect on what they found most engaging.

The establishing netiquette indicator (TP-DE-5) was only found once, in a general statement of expectation that fit in the ethical considerations theme. Because no specific examples of netiquette were given but a general statement about respecting "diversity of

thought, opinion, and background in all aspects of interaction and communication" was included, netiquette was considered only a supporting indicator in this theme.

Macro-level comments about the course content (TP-DE-6) were made in the first section of the syllabus as it described the relationship of the course to both the university's mission statement and the department's goals. While other sections of the syllabus (i.e., objectives, units, materials, calendar, and assignments) defined or listed the content, the only other theme that included comments about the content was the description of the discussion board activity. With the description woven through four different sections of the syllabus, the small part that noted the activity as one designed to result in "collaborative conversations" and "construction of knowledge" that would build learning was only a secondary focus.

The only direct instruction indicator present in the syllabus was that of presenting content and questions (TP-DI-1). This was the primary focus in the four assignment themes, with each explanation including specific questions students should answer in their assignments. The video assignment referenced the content (video) to be viewed, followed by a bulleted list specifying types of examples students should note when watching and a description of concepts to be included in their paper. The discussion board, critique, and philosophy assignments also presented specific statements about what the students should "discuss," "consider," "comment on," "suggest," "share," or "explain." Because these questions were only incorporated into the grading rubric for the critique assignment, the indicator was not a primary focus of the grading theme. The curriculum/materials theme included both the readings and the learning objects, such as the assignment descriptions. Since this indicator was already counted for the assignment descriptions, it was only considered a secondary indicator in the curriculum/materials theme.

Only one facilitating discourse indicator, setting the climate for learning (TP-FD-4) was present in the syllabus. This was found in the ethical considerations theme, as integrity and respect were emphasized. The emphasis on the honor code and discussion of plagiarism conveyed that the climate for the community would be one that valued integrity. Also, in three different sections of the syllabus outline, an admonition to be respectful was presented. While this was coded as the primary indicator in the ethical considerations theme, it was also a supporting indicator in the description of discussion board expectations (i.e., whether agreeing or disagreeing, students' comments should "respectfully engage" with the ideas presented by others) and in the defining characteristics of desired participation for the course.

Discussion board prompts. In contrast to the other assignment instructions, the discussion board assignment as posted in Blackboard was primarily focused on designing methods (TP-DE-2) such as number of words, number of required responses to peers' posts, and suggested parameters for the posts (e.g., "reflect on what you find most engaging…"). The posted assignment also included the due dates (TP-DE-3). While the instructions included statements about the types of responses that were expected (e.g., "demonstrates critical, personal engagement with the issues brought up in the text" and "incorporate reflections on where your own life experiences intersect…") the primary focus of the assignment description was on *how* the students should respond, rather than on *what* specific content or questions.

Announcements. Only Instructor A posted announcements during the course, all fitting in the teaching presence category of design and organization. Instead of using the announcement tool, Instructor B indicated in his interview that he sent frequent emails to the students clarifying information about the course expectations and assignments. Since the

researcher did not have access to emails, only Instructor A's use of announcements are described in this section.

Throughout the course, Instructor A posted 11 announcements in the course of nine weeks. These announcements ranged from 28 to 375 words. Except for a short (47 word) announcement in Week 5 about a university matter unrelated to course content, the shortest announcements occurred in the last three weeks. Throughout the course, announcements were generally posted on Sunday or Monday and usually included general feedback on previous assignments, an alert when grades had been posted, and reminders of upcoming assignments. The organizational focus of these announcements resulted in six of them having a primary focus of design and organization category, with three others primarily demonstrating facilitating discourse, one focused on direct instruction, and one unrelated to the course content.

Only five indicators were present in the announcements, whether as the primary focus or as a secondary indicator that served either as a sort of appendage to the main message or to further elaborate on the content. These included indicators in each category, but with a primary emphasis on design and organization.

The design and organization indicators of designing methods (TP-DE-2) and establishing time parameters (TP-DE-3) were present in seven of the announcements. These were often woven together, as seen in this announcement:

> If you have not posted your introduction, please do so right away. Because of the collaborative nature of the learning in this class, deadlines will be stricter than they might have been in previous classes. Your first reading response is due tonight at midnight. These should be at least 250 words, and they should be posted in the appropriate thread on the discussion board. By Friday, you need to post at least two 100-word responses to your peers' thoughts on the readings.

This message had strong elements of both explaining the methods (i.e., 250 words, in the appropriate thread, and two 100-word responses) and establishing time parameters (i.e., right away, deadlines, due tonight at midnight, or by Friday) and is an example of the challenge of coding at the indicator level. It was determined that the stronger message was the time parameters, but the other five messages in the design and organization category had a stronger focus on the methods to be used for the assignment. For example, while one announcement reminded students of the pattern of due dates for posting in the discussion board (TP-DE-3), its primary emphasis was the methods for grading and penalties that would be incurred for late posts (TP-DE-2). Another post, while including the due date, was aimed at summarizing the procedure for an upcoming assignment. In the design and organization category, a total of five posts were categorized as primarily designing methods (TP-DE-2) and one post was establishing time parameters (TP-DE-3).

The lengthiest post, in Week 5, was the only post coded as primarily direct instruction, presenting content/questions (TP-DI-1). The post included some general statements about the assignment just graded, including statements of reinforcing strengths (TP-FD-3) as well as reminders of the methods that were not followed (TP-DE-2). The majority of the post, however, reminded the students of the next assignment and its due date (TP-DE-3). Over half of the post presented15 different prompts for writing the paper, including both statements of what to include (e.g., "Begin by introducing your district or school") and questions to answer (e.g., "What is the 'official' policy on ELLs?"). In doing so, this announcement provided further elaboration on the instructions provided in the syllabus.

While only three announcements were seen as primarily focused on facilitating discourse, only two had no facilitating discourse indicators present. Nine of the

announcements had the indicator of reinforcing contributions (TP-FD-3), setting the climate for learning (TP-FD-4) or both. Of these, two announcements had reinforcing student contributions (TP-FD-3) as their primary focus and one was aimed at setting the climate for learning (TP-FD-4). These three announcements were the last three posted in the class (Weeks 7-9) and were three of the five shortest announcements (each under 100 words).

When reinforcement occurred, it was usually at the beginning of the post with a statement such as "These were great conversations," "Thank you for these great discussions," or "These [papers] were very strong overall." On the other hand, the statements setting the climate for learning generally occurred at the end of a post (e.g., "I am looking forward to…" or "I can't wait to read….").

Discussion board feedback. As noted in Research Question 1b, Instructor B used the feedback function of the gradebook tool to respond to student posts in the discussion board. He believed that giving individual feedback to the students was one of the chief benefits of online learning.

> Online teaching would also mean giving feedback. You tell all your teaching for the whole class, but teaching becomes individualistic. It becomes an important aspect of learning, because you don't have time to answer every person in a face to face class, but in an online class, every person participates in one way or another, especially in discussions.

As a result, he posted feedback within the grading tool for each student in each of Modules 2 through 8. Because only the feedback to study participants is included, this resulted in a total of 28 posts, an average of four per week. While 23 of these posts were coded as facilitating discourse, five as direct instruction, zero as design and organization these numbers may be misleading and warrant further illumination.

In his interview, Instructor B emphasized the importance of encouraging students:

> You always see 'great reflection'; you always see 'great posts.' What I try to do, because we are not seeing each other face to face, I want to encourage the students. I don't want to condemn their work. Even if they make a mistake during a post, I go in and say 'Oh, great reflection, you say XYZ, however from an ESL standpoint is should be A, B, and C.

Indeed, each response began with "Great reflection" or "Great reading response." For the 23 posts coded as acknowledging or encouraging student contributions (TP-FD-3), he went on with a statement reinforcing the content of the post in relationship to the assigned task. In the feedback for one student in Module 3 and all four students in Modules 4 and 5, Instructor B stated, "Great reflection: You connected your personal experiences to the readings." In Module 6, each student received the feedback, "Great reflection: You connected your personal experiences to the story line of the readings. You also responded to your colleagues' posts." In Modules 7 and 8 read, "Great reading response: you connected the readings to your personal experience" for all four participants. While these could have been coded as simply giving feedback or even restating the methods for the activity (TP-DE-2), they were coded as reinforcing the student contribution (TP-FD-3) because they included a qualitative statement about the posts (e.g., "you connected your personal experiences to the readings").

All of Instructor B's direct instruction posts in the discussion board feedback occurred in Modules 2 (*f* = 4) and 3 (*f* = 1) and were confirming understanding through assessment and explanatory feedback (TP-DI-4). These posts demonstrated what the instructor called "lectur[ing] through feedback… us[ing] the feedback to create a teachable moment." Each post began with positive reinforcement (e.g., "Great reflection") followed by a specific response to something the student had posted, providing further information on the topic. For example,

> Great reflection: our focus of teaching English Language Learners should be based on what the students "can do" and this is what criterion referenced assessment [*sic*] do. They enable the teacher to give feedback, which can be motivating for the students. These assessment [*sic*] also are authentic and teacher generated with the emphasis placed on what the students can do.

Instructor A posted 14 posts in the grading feedback section of the discussion board, but none to the study participants. These posts reinforced the design and organization of the assignment by pointing students to criteria in the instructions that they did not complete as a way of explaining why they did not receive full credit for their participation. For example, some posts focused on the student lacking the minimum number of required posts (e.g., "You are missing two peer responses") while others pointed to the length of the post (e.g., "Your initial post is short of the 250-word minimum…."). Since none of these posts were directed to study participants they were not included in the data for Instructor A.

Assignment instructions. The instructions for each of the assignments were identical for both instructors and a repetition of the assignment description included in the syllabus. Because they were presented to the students throughout the course as each became due, they were included again in the coding for the weeks in which they appeared. As noted in the previous syllabus description, the video assignment, critique assignment, and philosophy statement assignment were all primarily focused on presenting content and questions (TP-DI-4). These were either specific questions or specific items the students should "discuss," "analyze," consider," "present," "comment on," or "explain." While these descriptions, as posted, also included information on the methods students should use, such as number of pages (TP-DE-2) and the time parameter of due date (TP-DE-3), these were only three to four words in the critique and philosophy assignments and in the form of a list of three steps in the video assignment.

Project feedback. The researcher was only provided with the instructors' feedback to those students who consented to participate in the study. Therefore, a total of eight posts were coded for Instructor A and four for Instructor B. Instructor A's posts included four that were facilitating discourse by reinforcing student contributions (TP-FD-3) and four that were direct instruction by confirming understanding through assessment and explanatory feedback (TP-DI-4). Those that were facilitating discourse had a statement of positive reinforcement either about the entire post or some portion of it (e.g., "Nice job on this!" and "Thanks for sharing the graphs and tables"). They also were made up primarily of reaction or opinion statements, such as "I like the…," "I'm glad you've…," and "Oh dear, I'm sorry to hear…." The direct instruction posts also included either a statement of assessment (e.g., "You're right…" and "It's true…"), a content related comment either reinforcing or expanding upon what the student had said (e.g., "I'm not surprised your ELLs are doing very well – they're showing the cognitive benefits of bilingualism") or both of these. While not the primary focus, each post also asked the student one or more questions. These questions were sometimes asking for clarification of something the student had written and sometimes offering another idea to consider. Three posts also had statements that diagnosed misconceptions (TP-DI-5), although they were viewed by the coders as part of the explanatory feedback (TP-DI-4). For example, one post included a statement that began, "I think you are talking about dual-language rather than bilingual classes, since you say…." The instructor then went on to define each of the terms.

Instructor B's feedback for the projects fit the facilitating discourse indicator of encouraging or reinforcing student contributions (TP-FD-3). As in his discussion board feedback, the posts told the students how they had followed the assignment instructions. All

four posts were identical: "Your examination of your district's model for ESL/bilingual education as written and in practice was very succinct. You also presented an objective critic [*sic*] of your district's program."

RQ 1d. What Patterns of Student Cognitive Presence Develop in the Discussion Forum?

Student cognitive presence was examined both by week and by module due to the timing of the student posts. While students were encouraged to "feel free to continue to converse" upon completion of their required response posts for a module, they generally posted only in the module corresponding to the current week. However, some posted a day early for a module (i.e., posting on Saturday of Week 1 for Module 2's forum). Four students were late posting their introduction in Week 1, not posting until Sunday of Week 2. One of these students was late posting responses to peers in four other weeks (f = 10 posts), posting the responses that were due on Friday on the Sunday of the next week. Other than 14 late posts, there were only two posts (in Weeks 1 and 8) in which a student posted in a previous discussion forum (e.g., posted in Module 1 forum during Week 2). Each of these was in response to an instructor post, with no students returning to a previous forum to respond to a peer after the week was completed.

Student Cognitive Presence by Week

Table 12 presents the data for the student discussion board posts by week. Most of the posts in each group (66.50% of the posts in Group A and 68.87% in Group B) were at the integration level of cognitive presence. The exploration phase had the second highest number of posts (27.67% in Group A, 27.35% in Group B). During the entire course, only one post

Table 12

Number of Student Cognitive Presence Discussion Board Posts by Week

	Week								
Phase	1	2	3	4	5	6	7	8	Total
Group A									
Triggering Event	0	0	0	1	0	0	0	0	1
	(0.00)	(0.00)	(0.00)	(3.70)	(0.00)	(0.00)	(0.00)	(0.00)	(0.49)
Exploration	13	6	3	9	4	4	3	15	57
	(65.00)	(20.69)	(12.00)	(33.33)	(13.79)	(15.38)	(13.04)	(55.56)	(27.67)
Integration	4	22	22	15	25	22	18	9	137
	(20.00)	(75.86)	(88.00)	(55.56)	(86.21)	(84.62)	(78.26)	(33.33)	(66.50)
Resolution	0	0	0	0	0	0	2	1	3
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(8.70)	(3.70)	(1.46)
No cognitive presence	3	1	0	2	0	0	0	2	8
	(15.00)	(3.45)	(0.00)	(7.41)	(0.00)	(0.00)	(0.00)	(0.07)	(3.88)
Total	20	29	25	27	29	26	23	27	206
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
Group B									
Triggering Event	0	1	0	0	0	0	0	0	1
	(0.00)	(5.88)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.94)
Exploration	4	3	4	6	5	3	2	2	29
	(80.00)	(17.65)	(28.57)	(37.50)	(31.25)	(18.75)	(16.67)	(20.00)	(27.36)
Integration	1	13	10	9	9	13	10	8	73
	(20.00)	(76.47)	(71.43)	(56.25)	(56.25)	(81.25)	(83.33)	(80.00)	(68.87)

Table continued on next page

Table 12 cont. from previous page

No cognitive presence	0	0	0	1	2	0	0	0	3
	(0.00)	(0.00)	(0.00)	(6.25)	(12.50)	(0.00)	(0.00)	(0.00)	(2.83)
Total	5	17	14	16	16	16	12	10	106
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note. Numbers in in parentheses are the percentage of the week. No cognitive presence = posts with no cognitive presence indicator(s) observed.

(0.49% in Group A and 0.94% in Group B) in each group remained at the triggering event level. Only three posts, all in group A, (1.46% of their total posts) were at the resolution phase. The remaining posts (3.88% in Group A and 2.83% in Group B) had only teaching presence indicators or were of a social nature.

The most evident pattern of cognitive presence over time when grouping the data by calendar week was that both groups began with most of their posts remaining in the exploration stage in Week 1 (65.00% in Group A and 80.00% in Group B), quickly moving to integration phase (75.86% of the posts in Group A and 76.47% of the posts in Group B) in Week 2. The groups continued to reach levels of 55.00% or more of the posts each week at the integration phase, except in Group A which had the majority of its posts in Week 8 in the exploration phase.

Student Cognitive Presence by Module

While a similar pattern over time existed when examining the posts by module (Table 13), the shift from exploration phase to integration in Modules 1 and 2 was more dramatic than in the calendar week data. The four posts in Group A and one in Group B that were in the integration phase during the calendar Week 1 were actually posts that were submitted a day early and appeared in the second module's discussion forum. Therefore, 100.00% of the posts in each group for Module 1 were in the exploration phase. Similar to the calendar week data, both groups moved to the integration phase in Module 2 and, with the exception of Group A stalling at the exploration stage in Module 8, they remained primarily in the integration phase for the rest of the course. Figure 6 illustrates the cognitive presence patterns in the discussion board.

Table 13

Number of Student Cognitive Presence Discussion Board Posts by Module

	Module									
Phase	1	2	3	4	5	6	7	8	Café	Total
Group A										
Triggering Event	0 (0.00)	0 (0.00)	0 (0.00)	1 (3.57)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.49)
Exploration	12 (85.71)	6 (21.43)	4 (14.29)	9 (32.14)	4 (14.81)	3 (12.00)	3 (11.54)	16 (57.14)	0 (0.00)	57 (27.67)
Integration	0 (0.00)	22 (78.57)	24 (85.71)	16 (57.14)	23 (85.19)	22 (88.00)	21 (80.77)	9 (32.14)	0 (0.00)	137 (66.50)
Resolution	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (7.69)	1 (3.57)	0 (0.00)	3 (1.46)
No Cognitive Presence	2 (14.29)	0 (0.00)	0 (0.00)	2 (7.14)	0 (0.00)	0 (0.00)	0 (0.00)	2 (7.14)	2 (100.00)	8 (3.88)
Total	14 (100.00)	28 (100.00)	28 (100.00)	28 (100.00)	27 (100.00)	25 (100.00)	26 (100.00)	28 (100.00)	2 (100.00)	206 (100.00)
Group B										
Triggering Event	0 (0.00)	0 (0.00)	1 (7.14)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.94)
Exploration	4 (100.00)	2 (14.29)	2 (14.29)	7 (46.67)	5 (38.46)	4 (26.67)	1 (7.14)	4 (28.57)	0 (0.00)	29 (27.36)

Table continued on next page

Table 13 cont. from previous page

Integration	0 (0.00)	12 (85.71)	11 (78.57)	8 (53.33)	8 (61.54)	11 (73.33)	13 (92.86)	10 (71.43)	0 (0.00)	73 (68.87)
Resolution	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
No Cognitive Presence	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	3 (100.00)	3 (2.83)
Total	4 (100.00)	14 (100.00)	14 (100.00)	15 (100.00)	13 (100.00)	15 (100.00)	14 (100.00)	14 (100.00)	3 (100.00)	106 (100.00)

Note. Numbers in parentheses are the percentage of the module. No cognitive presence = posts with no cognitive presence indicator(s) observed; café = a forum in the discussion board for non-content related discussion (e.g. discussing a course assignment, asking about a professional resource, or sharing personal interests

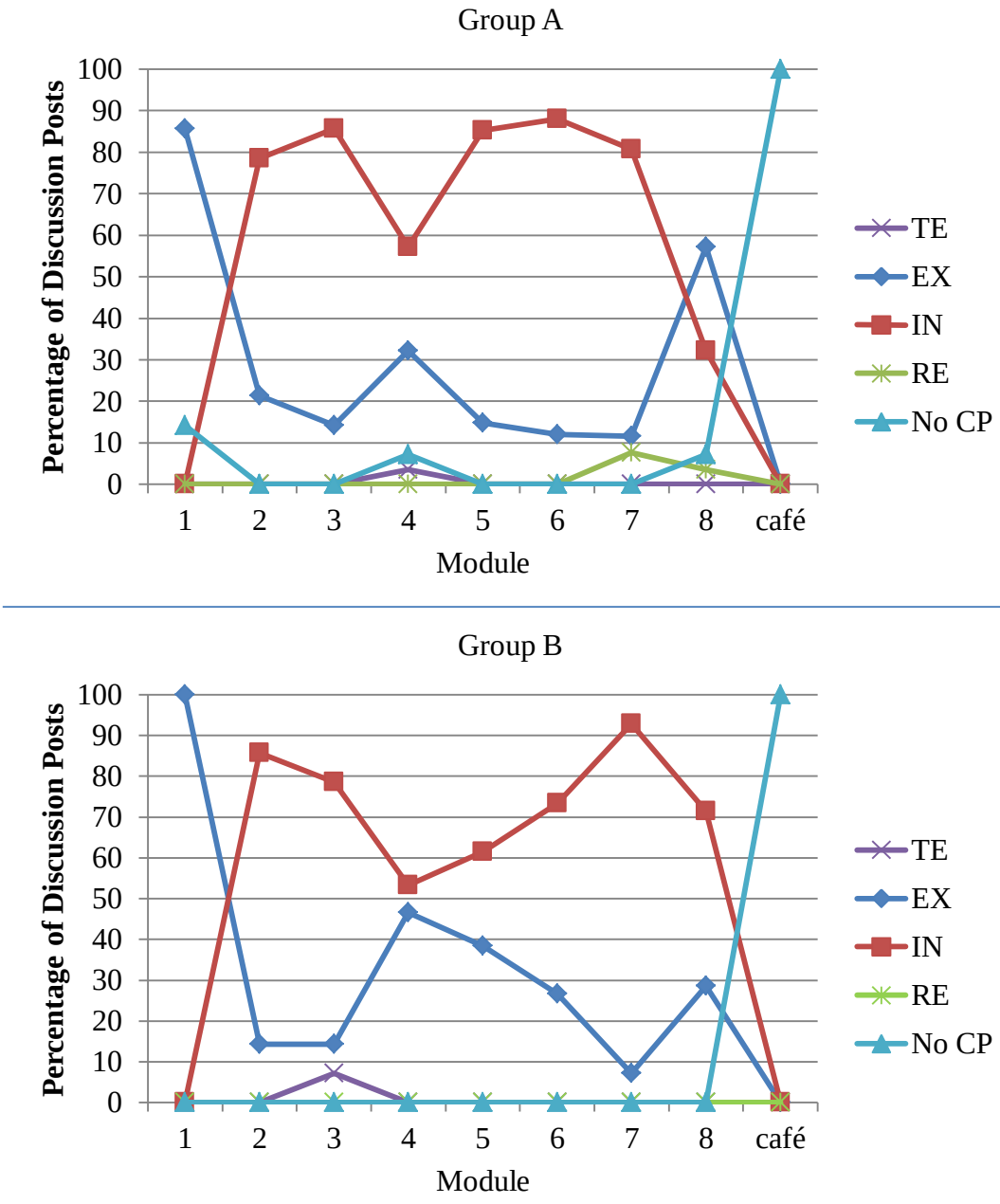

Figure 6. Percentage of discussion board posts at each phase of cognitive presence.

Note. Café = a forum in the discussion board for non-content related discussion (e.g. discussing a course assignment, asking about a professional resource, or sharing personal interests); TE = Triggering Event; EX = Exploration; IN = Integration; RE = Resolution; No CP = posts with no indicator(s) of cognitive presence observed.

In the week/module one discussion, students were directed to share "a reflection" on their own language development as well as information about their goals. This was "a way for [the group members] to get to know each other and for [students] to look back on [their] oral and written language acquisition." The posts shared experiences and exchanged information about the students' past (CP-EX-3). In this forum, only three students had multiple posts, all at the exploration phase. One was a student who responded to the instructor's introduction by making a connection with a unique name and a mutual enjoyment of travel. She followed this with her assigned introduction post, later submitting a third post that was an addendum ("Woops! I sent this out without expanding further on…"). The other students each responded to peers in short posts (less than 75 words) that shared an experience she had that mirrored the peer's. It was in modules two through eight that the discussion prompt asked students to demonstrate "critical, personal engagement" with the readings and to reflect on where their own experiences "intersect" with the material.

The other development over time was that the three posts, all in Group A, that reached the resolution stage were at the end of the course (in Weeks/Modules 7 and 8). There were no posts in Group B that reached the resolution stage.

However, it is important to note that not all of the integration and resolution posts were of the same quality. While the rubric of "coding up" (Garrison et al., 2001, p. 17) to a higher phase when multiple phases are present was used to be consistent with most CoI research, many posts were coded at these phases when only a small portion of it fit one of the integration or resolution phase indicators. For example, one student's post of 460 words began with 286 words restating what the readings had said:

> I found many topics in the readings this week interesting and helpful for me as I work with my bilingual students. The different approaches to literacy development, and the identification of special needs students, and use of various testing methods was very informative in [the] textbook. However, the most compelling topic for me was in [the] article… This article gave many excellent suggestions…

The post went on to describe four different topics presented in the readings (CP-EX-2). Finally, 102 of the 460 words integrated her classroom experience with the suggestions (CP-IN-3), noting that she already uses some of the suggestions and describing the "positive results" she has seen. However, she did not integrate any other sources, raise questions, or add additional thoughts (CP-IN-2 or CP-IN-3). Nor did she suggest any other solutions to the issue at hand (CP-IN-4) or describe other ways she has solved the dilemma (CP-RE-1). She just shared an experience that mimicked the suggestions in the readings and evaluated the results as "positive," without a summary of why she thought they were positive (CP-IN-2) or why she believed they had the outcome they did (CP-RE-2). This was followed by the final 73 words asking for further resources (TP-FD-5) and offering unsupported opinions (CP-EX-6), not connected to the integration part of the post. So, while part of the post connected her experience to the readings (CP-IN-3), it was a small part of the post and was not used to support any conclusions or to create any solutions.

Similarly, another student used most of her 344 word post to restate an article's content:

> I found the article Working with English Language Learners very useful and practical. I appreciated teh [*sic*] way in which it was written. It was a very easy read, packed with a lot of information. One part I found particularly interesting…. The author also gives…. I also specifically liked the section in this article about…. Third, I appreciated the last section which empahsized [*sic*]….

In one part of this post (64 words), she connected her personal experience to a part of the article that she "found particularly interesting." She stated that the section was "encouraging"

to her because it talked about how children learning a new language sometimes need silence and she had a student in her classroom that hadn't said a word to her yet in that school year. She concluded that it was "reasuuring [*sic*] that this silent phase is necessary for him." While this connecting experience to the reading content was integrating information from various sources (CP-IN-3) the connection was on an emotional level (e.g., "encouraging" and "reassuring") and did not reflect any problem solving or development of possible solutions.

Patterns of Cognitive Presence Phases and Indicators

A brief description of posts within each cognitive presence phase is provided in this section. Table 14 provides frequency data for specific cognitive presence indicators in the posts. Some posts had multiple indicators, but only those indicators present in a post coded at that phase are included in the frequency data. For example, a post that reached the integration phase may have had exploration phase indicators present, but only the integration indicators are included in the count for that data.

Triggering event phase. Although there were numerous examples of students presenting background information that ended with a question for their peers (CP-TE-1) or expressing a sense of puzzlement (CP-TE-2), it was part of the process of moving to the next phase in all but two posts (one in each group). This is because students would often express puzzlement but go on to explore the topic further or integrate their experience with the background information they had provided, thus reaching the exploration or integration phase in that post. This part of the post appeared to be the student "thinking out loud" and usually included the phrase "I wonder…." For example, in the discussion that centered on the phenomenon of minority languages "dying" because its users are expected to speak English,

Table 14

Cognitive Presence Indicators Present in Culminating Phase for Each Student Discussion Board Post

		Group	
Phase and Indicator	Code	A	B
Triggering Event (TE)			
Recognize problem	CP-TE-1	1 (0.39)	1 (0.74)
Sense of puzzlement	CP-TE-2	1 (0.39)	0 (0.00)
Total Triggering Event		**2 (0.78)**	**1 (0.74)**
Exploration (EX)			
Divergence – within the online community	CP-EX-1	0 (0.00)	0 (0.00)
Divergence – within a single message	CP-EX-2	10 (3.91)	9 (6.67)
Information exchange	CP-EX-3	20 (7.81)	13 (9.63)
Suggestions for consideration	CP-EX-4	2 (0.78)	2 (1.48)
Brainstorming	CP-EX-5	8 (3.13)	5 (3.70)
Leaps to conclusions	CP-EX-6	22 (8.59)	12 (8.89)
Total Exploration		**62 (24.22)**	**41 (30.37)**
Integration (IN)			
Convergence – among group members	CP-IN-1	65 (25.39)	35 (25.93)
Convergence – within a single message	CP-IN-2	34 (13.28)	15 (11.11)
Connecting ideas, synthesis	CP-IN-3	73 (28.52)	37 (27.4)
Creating solutions	CP-IN-4	16 (6.25)	6 (4.44)
Total Integration		**188 (34.38)**	**93 (68.89)**
Resolution (RE)			
Vicarious application to real world testing solutions	CP-RE-1	3 (1.17)	0 (0.00)
Defending solutions	CP-RE-2	1 (0.39)	0 (0.00)
Total Resolution		**4 (1.56)**	**0 (0.00)**
No cognitive presence		**8 (3.13)**	**3 (2.22)**
Total indicators observed		**256 (100.00)**	**135 (100.00)**

Note. All indicators present in the highest phase of the post are included. Some posts had multiple indicators. CP = Cognitive Presence, TE = Triggering Event, EX = Exploration, IN = Integration, RE = Resolution, No cognitive presence = posts with no cognitive presence indicator(s) observed. Codes represent the presence followed by the phase and indicator (e.g., CP-IN-1 = Cognitive Presence – Integration phase – indicator #1). Coding scheme from Garrison, Anderson, & Archer (2001).

one student wrote, "I wonder what will happen as time goes on with English, Spanish, Chinese and all the giant languages of the world?" but went on to offer a suggestion for consideration (CP-EX-4) as well as to explore additional topics (CP-EX-2). Therefore, the question that took the discussion in a new direction was actually a part of a higher level phase of cognition. Another student integrated her experience with that of a peer's as well as the text and posed a rhetorical question in the process. In responding to the "amazing fact" found in the readings about more than 6,000 languages existing in the world she wrote, "I wonder how many languages the average person can actually name." She responded to her own question by acknowledging that "there are many languages that I have never even heard of or even knew they existed." She also built on a peer's post (CP-IN-1) that had discussed an experience she had with a student from Africa by adding that "there may be many dialects within a language and multiple languages may be spoken in one place."

Both of the posts that remained at the triggering event phase asked questions but did not explore the topic further or offer any possible solutions. For example, one student described how she has opportunities in her kindergarten classroom to "support English acquisition without formal instruction in the language." She went on to share that some find vocabulary, sounds, and letters to be "overwhelming," thus presenting background information. The post culminated in a question (CP-TE-1), "Are some students more capable of acquiring and storing the languages? Does their developmental level have an impact on their ability to do these tasks?" While this could have been seen as the teaching presence skill of prompting discussion (TP-FD-5), it was asked in the context of the author's process of making sense of the topic of language acquisition and therefore coded as a triggering event.

Exploration phase. Of posts that remained at the exploration phase, the most frequent indicator was information exchange (CP-EX-3), appearing in 33 of the posts (*f* = 20, 9.71% of Group A posts; *f* = 13, 12.26% of Group B posts). Many of these posts (60.00% of Group A's CP-EX-3 posts and 30.77% of Group B's) occurred in Module 1 as students shared their experiences in language learning as well as in teaching. Like other CP-EX-3 posts in Modules 2-8, the students shared experiences (e.g., a student's language acquisition) as a way to understand a specific issue or problem but were not part of supporting any conclusions. They were often presented as something the reading (or another student's post) "reminded me of" or "made me think of." Others were presented as an example of something that "caught my eye" or "peaked [*sic*] my interested [*sic*]," that the student found "interesting" or "fascinating," or that the student was "intrigued by." While these experiences were shared because they connected to the readings, they were not shared to support any conclusions, solutions, or hypotheses as in the integration phase. Others described an experience the student had as a result of the readings:

> Hi [Maria], I agree that these two chapters were packed with useful information. I too liked the visuals and made copies of them to hang around in my office. I think that they will serve as valuable, quick reminders…

This example also demonstrates that some posts agreed with another student but did not share the experience to substantiate her agreement or to build upon the peer's ideas, as is the case in convergence among group members (CP-IN-1).

Another frequent indicator in the posts that stalled at the exploration phase was that of divergence within a message (CP-EX-2) or presenting many different ideas or themes in the same message, but not building on them or connecting them to a conclusion or another post. Present in ten messages in Group A (4.85%) and nine messages in Group B (8.49%), these

were sometimes a reflection of responding to multiple chapters in the text or other readings and the student was restating the content. For example, one student wrote a lengthy post (402 words) that covered many topics but didn't develop any of them:

> I found the history of bilingual education in the United States somewhat surprising. I did not realize how many times changes were made in educational policies… Also in Chapter 9 of [the text], I found the explanations for underachievement in bilinguals so insightful…In Chapter 10 of the text book, the issue of mainstream classes and the difficulties they pose…Chapter 11 explained the many different models for bilingual education…

Some of the messages coded as CP-EX-2 (five in each group) actually only had two topics in them, not "many." With the exception of two of these posts, all had other indicators of exploration present, therefore making the post clearly at the exploration phase. These two posts were still coded as exploration because they were still exploring the topic and trying to understand it. Most of the posts coded as CP-EX-2 began with statements like "There were numerous things in this week's reading that were very thought provoking…," "A few things in this weeks [*sic*] reading really caught my eye…," or "quite a few things caught my attention." These posts went on to summarize or restate the content and often added reactionary or qualitative statements about the content. For example:

> There were a few points that stood out to me in chapters seven and eight. First, [the author] discusses the idea of bilingualism and communicative sensitivity. He explains that… [student continues to summarize content and insert a quote from the text]. He continues by listing examples such as…. [The author] went as far as to say that…. Second, I loved the illustrations used…. It makes senses that… . In addition, I also appreciated the visual of the house used to explain the Thresholds Theory. It made it very clear for me in understanding the challenges and strengths of bilingual students (and at what point students are experiencing both). Finally, I loved the chart on page…. [The author] also breaks down which tasks are context embedded. I found this section very helpful.

Other posts coded as CP-EX-2 had agreement with a peer's post, but it was agreeing with the peer's reaction to the reading and not a particular concept. Further, the post often went on to explore other themes:

> [Angela], I so agree with you; I never realized that there were so many different classifications of being bilingual. I knew…. As I read the chapter regarding endangered languages, I questioned as to how we can save languages…I also agree with the quote you mentioned about the purpose of language….

This post reflects three themes in one message: 1) what it means to be bilingual, 2) how we can save endangered languages, and 3) the purpose of language. No one idea is developed or built upon.

Of the ten posts in Group A that included multiple topics, five also included an unsupported opinion or conclusion (CP-EX-6). In Group B six of the nine exploration phase posts with multiple topics also had evidence of leaping to a conclusion. Because these posts covered more than one topic, even the longer ones did not go into depth on any one topic, and therefore did not provide any explanation for or depth of support for the conclusion or opinion. For example, one post explored three different themes (CP-EX-2) and concluded each with an unsupported opinion:

> When reading [the text] Chapter 11, the aspect of international peace initiatives really resonated with me. Utilizing Dual Language Schools to bridge the gap between communities and heal the wounds from social injustice is a profound way of inciting peace…. Teaching youth the acceptance of others is starting at the root of society, as the future has always lied [*sic*] with the children…. In contrast reading about the eradication of the Native American cultures of the U.S. was appalling…. It was unfair and unjust to eradicate an entire culture purely based on distaste and intense patriotism. Another program found to be interesting was the Master Apprentice Language Learning Program… then to take that knowledge learned through an intense apprenticeship and pass it along as a teacher makes the apprenticeship more valuable.

A total of 22 (10.68% of the group's total posts) of the exploration posts in Group A and 12 (11.32%) in Group B offered unsupported opinions or leapt to conclusions (CP-EX-6). These

were often marked by phrases such as "I believe," "I think," or "it would seem that if…." Others included opinions about what "should" occur or be, or opinions about what is important. Some of these posts contained a description of an experience (CP-EX-3) concluding with a general statement of opinion. In some cases the opinion was explicitly connected to the experience but in others it was not. For example, in one post a student spoke of her travels to another country and working with children there. She concluded by stating that she doesn't just want to teach English as a second language, but to learn about the students' "first language and their culture." She concludes with her opinion that "that should never be forgotten, because it makes us who we are." Another student responded to a peer with empathy for her because she works in a district "that does not provide services for the ELL students." She added that these services often have "a positive effect on the child's learning experience. [The students] make such nice gains when they are given opportunities to support their learning in the classroom, and their language acquisition in English." However, she did not include any examples or connect any information from the readings to support her statement.

Two other exploration phase indicators (i.e., CP-EX-4 and CP-EX-5) were much less prevalent and another (CP-EX-1) was not present in any posts. While there were no posts that exhibited CP-EX-4, offering a suggestion for consideration and "explicitly characteriz[ing]" it as exploration by asking a question about whether she was "about right" (Garrison et al., 2001), there were four messages (two in each group) that offered a suggestion for consideration. One of these presented the solution in question form (i.e., "…but should we try to enforce some sort of arbitrary language rules that minority speakers will resent and consequently not live by?"). One of these was in response to a problem a peer had expressed

about her students who can communicate in English but struggle when using "academic language in writing." The post offered a suggestion for how the peer could handle the situation.

The final code in the exploration phase (CP-EX-5) indicated students brainstorming and was present in eight of the exploration posts in Group A (3.88% of the group's total posts), and five (4.72%) in Group B. Two of these posts in Group A and three in Group B occurred in Module 4, when the article reading focused on "Delaying the onset of Alzheimer disease." These posts generally brainstormed reasons for a statistic presented in the article (e.g., bilingual individuals developed symptoms of Alzheimer's disease five years later than monolinguals). For example, one student began by stating that "It does make sense that people who know two different languages…" followed by a list of reasons why it makes sense (e.g., they "have better attention and cognitive control," "have to focus in on two different languages," using both languages "would require a better sense of concentration and focus," or "their brains are distinguishing and interpreting two forms of communication"). Other posts similarly brainstormed points connected to the reading. One student responded to the idea of "assimilation theory," (an idea proposing that minorities in America need to learn English to fit in) by brainstorming reasons people should also be encouraged to maintain the language and culture of their heritage. Regardless of the topic, each of the CP-EX-5 posts brainstormed ideas connected to the topic but didn't develop them as part of a hypothesis or solution to a problem.

Integration phase. As noted above, although 66.50% of the posts in Group A and 68.87% in Group B were coded at the integration phase, some posts more clearly fit this phase than others. An explanation of the presence of each indicator illustrates this point.

The most frequent indicator of the posts that were in the integration phase was that of integrating information from various sources (CP-IN-3), present in 73 of the integration posts in Group A (35.44% of the group's total posts) and 37 (34.91%) in Group B. The level of integration, however, ranged from recalling a point in the reading and connecting it to a past experience, previous course, or situation in her classroom to a post that integrates vocabulary from the readings, points to additional resources, and compares or contrasts ideas. Those posts that connected only two sources with only a brief sentence or two were often posts that also explored multiple topics. Of the 110 posts that reached the integration phase by connecting ideas (CP-IN-3) as at least one of the indicators, 30 also had the exploration indicator of many different themes or ideas being present in one message (CP-EX-2). One post that was hardly distinguishable from an exploration post in fact had more than two-thirds of its content marked by exploration phase indicators, all unrelated to the topic demonstrating integration. The post quoted the textbook as it made the point that the idea that one only needs to speak English is "naïve and outdated" and went on to give an example of how she had seen that in her own life, "For instance, when I have looked at various job openings, it is almost always a benefit if the person applying speaks Spanish as well." Another student expounded upon three different ideas that "made [her] stop and think," giving examples from her past experience or current examples in her teaching, but only connecting her experience and incorporating vocabulary in one portion. In that portion, she shares her experience with people being impressed that she's "fluent in Spanish." She expresses disdain for this because there are "so many dimensions of being 'fluent.'" Quoting a portion of the text to support her conclusion, she goes on to utilize vocabulary from the reading in dubbing herself a "passive bilingual" because she is more proficient in reading and comprehending the language than

speaking it. She concludes this portion of the post by stating that "After reading Chapter One in the textbook, I think it will be difficult for me to continue to give a simple definition of bilingualism…because there are so many facets as to what it means to be bilingual." The remainder of the post (more than half of the content) goes on to discuss the next chapter in the text as well as her previous course to say that that topic "seems to be on my mind." She continues to describe her current teaching situation, a conference she recently attended, and an activity she does with her students but does not incorporate any of the information from the text or the previous class to illumine the situation. Further, she doesn't connect the three topics in her post under the same theme.

Other posts more clearly demonstrated synthesis and higher order thinking. Often these posts wove together past experience, class readings, content from other courses, and even outside resources. For example, one student began her post with a quote from the textbook and then offered examples of how her teaching experience in two different schools, her cumulative studies in her Master's program and her experience working with English Language Learners have contributed to the evolution of her thinking to be similar to the point in the text. She also compared and contrasted a student she spoke with the previous week and a student she worked with for her case study in her previous course, concluding that they were "two English Language Learners with completely different needs and supports, proving…" the point she began with. She then described the assessment her school uses and how she had studied it during her previous course's case study. She again integrated the text by quoting the textbook as she concluded that "this assessment provides 'what a child can and cannot do on a precise breakdown of language skills'…." Another post integrated the textbook information with both an article the student had read "just a few weeks ago" and personal

experience. This student also vowed to use the "ton of new vocabulary and buzzwords for this class" in her "lingo for future discussion posts." Four weeks later she wrote

> Translanguaging is also a very cool topic to discuss… I also have students that can switch between languages (Spanish and English [*sic*] but it is not always easy. Code-switching is almost like a lighter version of translanguaging which is something I tend to see more often… Once a student reaches the level where they can "translanguage" I feel as though they have a firm grasp on both languages in a comfortable sense.

Many of the posts that integrated information from multiple sources (CP-IN-3) simply integrated the student's experience with a quote or summary of a point made in the text. These were introduced by statements such as "As I was reading about [the topic], I could not help but think about…" or "Another personal connection happened for me when I read about …" and the student went on to describe the related experience.

Personal experience was also a frequent part of posts that provided substantiated agreement with a peer's post or built upon a peer's ideas (CP-IN-1). The second most frequent indicator, these types of posts were present in 65 of the integration posts in Group A (31.55% of the total posts) and 35 (33.02%) of those in Group B. For example, one student had reflected on the reading and shared how her family has lost its heritage language because only her grandfather spoke it and it wasn't passed on. Another student responded by building upon this idea saying "I think that because monolingualism is so highly valued as the norm in the U.S. and the U.K., native languages are at a much higher risk of dying in these countries" and went on to describe an experience a colleague had in the supermarket where someone criticized a couple who were speaking in their native language. Another student agreed with a peer's contention that a primary reason students don't get the services they need is lack of funding. She supported her agreement by describing how her small district does not have the resources to provide services due to the small number of students spread across all grades and

the number of languages represented. Another student further built on the ideas by describing how her large district is "implementing the same type of strategies." She went on to describe how she is getting her ESL endorsement to provide services for her students but interjects another concern, thus building upon the complexity of the problem.

It should be noted that many posts with reference to another post and expressions of agreement were posts where a student simply agreed that something was "interesting" or that she "also enjoyed" something, not agreeing with a new idea. For example, one student wrote, "Hi [Annie]! I agree – I too like the analogy by [the author]." These were not coded as CP-IN-1 unless the student went on to build upon the peer's post or offered discussion that fit one of the other indicators.

Another variation in these posts was those posts that were coded as CP-IN-1, but referred to a previous post followed with substantiated *disagreement*. While there was a code for divergence (CP-EX-1), it was for unsubstantiated disagreement. The posts coded as integration showed disagreement, but were supported by references from the text, examples, experiences, or outside resources. Some of these began with agreement but then presented a contrasting theme. For example, one student wrote, "I agree with the first part of your statement when you said, 'They may struggle, but it pushes students to master the language.' In today's age, though, I don't want to put my children in a school situation where 'they may struggle.'" The student went on to develop her argument by providing a rationale for her statement.

A third form of integration was evident in posts that presented a hypothesis and developed or justified it (CP-IN-2). This indicator was present in 34 of Group A's posts at the integration phase (16.50% of the total posts) and 15 (14.15%) of Group B's. Often these

hypotheses were developed through sharing experiences or examples from the student's classroom, integrating textbook information, or both. For example, one student began her post with a hypothesis based on summarizing her reading, "In an ideal world, The Holistic View of Bilingualism can be the basis of assessments and testing when working with diverse student demographics." She goes on to describe her school, its students, teachers, specialists, and classrooms. She incorporates textbook information when she says, "They are measured exactly as [the] text refers to as *The Monolingual view*..." and concludes with the hypothesis, "Learning English is not a disability." Another student presented the idea in the text she agreed with but presented her hypothesis as a caveat to the idea, thus developing a new conditional hypothesis (i.e., "Bilingualism helps young readers become better readers in their second language. However, it is extremely important…"). Her idea was supported with an experience from her classroom and a restating of her hypothesis as "the most important idea we need to take away…."

The final indicator for the integration phase was that of creating solutions (CP-IN-4). Of the posts that reached the integration phase, 16 in Group A and 6 in Group B had this indicator, accounting for 7.77% and 5.66% (respectively) of the total posts in each group. These posts were most often in the form of offering suggestions to a peer on how to solve a problem that was presented in a previous post. While students did not "explicitly" characterize their statements as solutions (Garrison et al., 2001), they were clearly in the context of a solution. For example, one student discussed a dilemma with choosing dual-language books. After describing how these books "should be chosen" as well as summarizing the negatives of many of the books, she concludes, "Hmmm I think I gave myself an idea… I think that…." and presents a suggestion of characteristics necessary in the

books. Another student agreed with a peer's articulation of problems students encounter in developing literacy skills. She then asked if there were grants available but concluded, "However, there is nothing preventing us from asking parents to donate items…." She further supported her solution by stating benefits that both the school and the parents would receive if this solution were enacted. Other posts offered an analysis of both positive and negative outcomes foreseen if the solution were used. Most of these posts had clear evidence of the skills of analyzing possible outcomes or thinking through the pros and cons of the solution.

Resolution phase. Only three posts (1.46%), all in Group A, reached the resolution phase. Each of these posts occurred in Modules 7 and 8 and was evidence of a student providing examples of how problems were solved (CP-RE-1), with one also having evidence of describing why it was solved in specific manner (CP-RE-2). Due to the length of the course, these posts did not describe solving a specific problem situation described in the class discussion, but described how they had solved a similar problem in the past. For example, in a conversation about working with parents who speak little English, one student wrote, "The best thing I've found is…" (CP-RE-1) followed by the reasons for doing it that way supported by an analysis of the pros and cons (CP-RE-2). Another post described the solution that had been tried and why (i.e., "in order for them to see…") but did not defend that reasoning by providing any insight into how the conclusion was developed. In the third post the student shared how she had solved a group work issue (CP-RE-1) but described why it was working, not why she had come to the conclusion that she should try that particular solution.

Research Question 2

All data sources (except the survey) for both students and instructors were examined

for Research Question 2 (RQ2), "What is the relationship between teaching presence and content-based cognitive presence?" The teaching-learning process was explored both in the discussion board and in other components of the class sections. Three types of patterns were examined, corresponding to three sub-questions:

RQ 2a. What is the relationship between student teaching presence and content-based cognitive presence in the discussion forum?

RQ 2b. What is the relationship between instructor teaching presence and student content-based cognitive presence in the discussion forum?

RQ 2c. What is the relationship between instructor teaching presence as demonstrated by multiple data sources and student content-based cognitive presence in final projects?

In this section, each sub-question is addressed by examining the data by group and for individuals. Brief examples from the data sources that exhibited various categories/phases and indicators are also given.

RQ 2a. What Is the Relationship Between Student Teaching Presence and Content-Based Cognitive Presence in the Discussion Forum?

Group Comparisons

Of the 40 student posts in Group A demonstrating teaching presence, 35 (87.50%) also demonstrated cognitive presence. In Group B, each of the nine student posts (100.00%) demonstrating teaching presence also demonstrated cognitive presence. This section discusses characteristics of those posts in more detail.

Because 87.50% *(f* = 35) of the teaching presence posts in Group A and 66.67% *(f* = 6) of those in Group B had facilitating discourse indicators, as one might expect, most of the posts that also demonstrated cognitive presence were in the facilitating discourse category *(f* = 32, 91.43% of the posts with both presences in Group A; *f* = 6, 66.67% in Group B). Two of these posts each had two different facilitating discourse indicators. The remaining three posts in each group were in the direct instruction category of teaching presence. There were no design and organization posts in either group that also had indicators of cognitive presence. Table 15 summarizes the teaching presence posts in each category in relationship to the phases of cognitive presence in each of those posts.

Table 16 summarizes the frequency of indicators that were present for both teaching presence and cognitive presence. While each post was only counted once for the category/phase within teaching or cognitive presence in Research Question 1 (RQ1), in this table each indicator present within that category is included. In Group A there were two posts with two facilitating discourse indicators each. These two posts were counted twice (once in each FD indicator present), therefore showing 37 total posts, not the 35 actual posts. Four other posts (at the integration phase) each had two cognitive presence indicators, making a total of 41 cognitive presence indicators shown. Group B had no posts with more than one teaching presence indicator, but two posts at the integration phase and two at exploration with two cognitive presence indicators each and one (at the exploration phase) with three indicators. These six additional indicators result in a total of 15 cognitive presence indicators present for Group B in the nine posts.

Table 15

Number of Cognitive Presence Posts Also Exhibiting Teaching Presence

	Triggering Event		Exploration		Integration		Resolution		No cognitive presence observed		Total	
Teaching Presence Category	*f*	%[1]	*f*	%[1]	*f*	%[1]	*f*	%[1]	*f*	%[1]	*f*	%[1]
Group A												
Design and Organization % within TP-DE	0 (0.00)	(0.00)	0 (0.00)	(0.00)	0 (0.00)	(0.00)	0 (0.00)	(0.00)	1 (100.00)	(12.50)	1 (100.00)	(0.49)
Direct Instruction % within TP-DI	0 (0.00)	(0.00)	1 (25.00)	(1.75)	2 (50.00)	(1.46)	0 (0.00)	(0.00)	1 (25.00)	(12.50)	4 (100.00)	(1.94)
Facilitating Discourse % within TP-FD	0 (0.00)	(0.00)	11 (31.43)	(19.30)	20 (57.14)	(14.60)	1 (2.86)	(33.33)	3 (8.57)	(37.50)	35 (100.00)	(16.99)
No teaching presence observed % within No TP	1 (0.60)	(100.00)	45 (27.11)	(78.95)	115 (69.28)	(83.94)	2 (1.20)	(66.67)	3 (1.81)	(37.50)	166 (100.00)	(80.58)
Total % total TP	1 (0.49)	(100.00)	57 (27.67)	(100.00)	137 (66.50)	(100.00)	3 (1.46)	(100.00)	8 (3.88)	(100.00)	206 (100.00)	(100.00)

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Table 15 cont. from previous page

Group B												
Design and Organization % within TP-DE	0 (0.00)	(0.00)	0 (0.00)	(0.00)	0 (0.00)	(0.00)	0 (0.00)	(0.00)	0 (0.00)	(0.00)	0 (0.00)	(0.00)
Direct Instruction % within TP-DI	0 (0.00)	(0.00)	1 (33.33)	(3.45)	2 (66.67)	(2.73)	0 (0.00)	(0.00)	0 (0.00)	(0.00)	3 (100.00)	(2.83)
Facilitating Discourse % within TP-FD	0 (0.00)	(0.00)	3 (50.00)	(10.34)	3 (50.00)	(4.11)	0 (0.00)	(0.00)	0 (0.00)	(0.00)	6 (100.00)	(5.66)
No teaching presence observed % within No TP	1 (1.03)	(100.00)	25 (25.77)	(86.21)	68 (70.10)	(93.15)	0 (0.00)	(0.00)	3 (3.09)	(100.00)	97 (100.00)	(91.51)
Total % total TP	1 (0.94)	(100.00)	29 (27.36)	(100.00)	73 (68.87)	(100.00)	0 (0.00)	(100.00)	3 (2.83)	(100.00)	106 (100.00)	(100.00)

Note. Numbers in parentheses under the frequency represent the percentage of total teaching presence posts in that category. No cognitive presence observed = posts with no indicator(s) of cognitive presence phases observed; No teaching presence observed = posts with no indicator(s) of teaching presence categories observed; TP-DE = Design and Organization; TP-DI = Direct Instruction; TP-FD = Facilitating Discourse; No TP = No teaching presence observed.

1. Numbers in parentheses in columns represent the percentage of the total cognitive presence posts in that phase.

Table 16

Number of Observed Indicators in Student Posts with Both Teaching and Cognitive Presence

	Teaching Presence Indicator													
	Identify Agree/ Disagree (TP-FD-1)		Encourage/ Reinforce (TP-FD-3)		Setting Climate (TP-FD-4)		Prompt Discussion (TP-FD-5)		Share Experience (TP-FD-7)		Inject Knowledge (TP-DI-6)		Total	
Cognitive Presence Indicator	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Exploration Phase														
Divergence in Single Message (CP-EX-2)	0	0	0	3	0	0	0	0	0	0	0	1	0	4
Exchange Information (CP-EX-3)	1	0	4	0	6	0	0	0	1	0	1	1	13	1
Offer Suggestions (CP-EX-4)	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Brainstorming (CP-EX-5)	0	0	1	0	0	0	0	0	0	0	0	1	1	1
Leap to Conclusions (CP-EX-6)	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Total Exploration	**1**	**0**	**5**	**6**	**6**	**0**	**0**	**0**	**1**	**0**	**1**	**3**	**14**	**9**
Integration Phase														
Convergence – Substantiated Agreement (CP-IN-1)	0	0	6	1	0	0	2	0	0	0	1	0	9	1
Convergence – Presents Justified Hypothesis (CP-IN-2)	0	0	3	1	0	0	3	0	0	0	0	0	6	1
Connect Ideas – Synthesis (CP-IN-3)	0	0	5	1	1	0	3	1	0	0	1	1	10	3
Create a Solution (CP-IN-4)	0	0	0	1	0	0	1	0	0	0	0	0	1	1
Total Integration	**0**	**0**	**14**	**4**	**1**	**0**	**9**	**1**	**0**	**0**	**2**	**1**	**26**	**6**

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Table 16 cont. from previous page

Resolution Phase														
Vicarious Application to Real World (CP-RE-1)	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Total for the TP indicator in posts with CP	**1**	**0**	**20**	**10**	**7**	**0**	**9**	**1**	**1**	**0**	**3**	**4**	**41**	**15**
Number of posts	1	0	19	5	7	0	6	1	1	0	3	3	35[a]	9[b]

Note. Teaching presence = TP; Facilitating Discourse = FD; Direct Instruction = DI; Cognitive Presence = CP; Exploration = EX; Integration = IN; Resolution = RE
a. Group A had 35 posts with both teaching and cognitive presence. However, two of the posts (at the exploration phase) had two different facilitating discourse indicators present, thus showing 37 posts here. Additionally five other posts (all at the integration phase) each had 2 CP indicators, making 42 indicators shown in the table for the 35 actual posts.
b. Group B had nine posts with both teaching and cognitive presence. Four of these (two at exploration and two at integration) each had two CP indicators and one post (at the exploration phase) had three CP indicators, making the 15 indicators shown in the table.

Facilitating discourse and cognitive presence. The most prominent teaching presence indicator (*f* = 20, 54.14% in Group A and *f* = 10, 66.67% in Group B) of those posts with both teaching and cognitive presence was encouraging, acknowledging, or reinforcing student contributions (TP-FD-3). In Group A, 70.00% (*f* = 14) of these posts were at the integration phase of cognitive presence but in Group B most of the posts (60.00%, *f* =6) were at the exploration phase. In the posts with a TP-FD-3 indicator, no one cognitive presence indicator emerged as predominant in either group. This is because the words of reinforcement or encouragement were general, simple phrases that could lead either to further exploration of the topic, to integration and synthesis of ideas, and even to the resolution phase of discussing solving of the problem. For example, 13 of the posts used some adjective (e.g., "perceptive," "poignant," "insightful," "interesting") to describe the peer's post. This was sometimes

followed by content at the exploration phase, such as the student who began "I found your reading response regarding High School Spanish so interesting! It is great that you focus so much on…." She continued to restate the content of the peer's post, inserting phrases evaluating each piece (e.g., "It is so helpful to be able to…," "…is an excellent idea," "…would be a valuable tool"). In contrast, another student responded to her peer by expressing agreement with the post (i.e., "I can relate to the idea…," "I agree with you 100%," and "I do agree it is….") and building on the ideas by sharing her observations based on experience (CP-IN-1). She concluded her post of agreement with the statement reinforcing the peer's post, "Nice jobe! [*sic*]." A third post also began with reinforcing the peer's contribution (i.e., "You bring up an interesting point about..."). This post also shared an experience that mirrored the one described in the original post as well as her similar feelings (i.e., "I myself feel…"). However, this post went on to the resolution phase of cognitive presence as the student went on to discuss solving the problem (i.e., "To help with this I…") and gave an example of a situation where her solution worked (CP-RE-1). She concluded with another reinforcement of the post (TP-FD-3), "Nice post!"

Other facilitating discourse indicators did have a clear pattern of relationship with a particular level of cognitive presence. The indicator of setting climate for learning (TP-FD-4) was primarily found in the exploration phase. Again, characteristics of the posts illumine this relationship. First, six of the seven posts demonstrating this indicator occurred in Module 1 when the students were introducing themselves. The posts often concluded with the TP-FD-4 portion of the post. Six of these were some statement including the phrase "I look forward to…" (e.g., "working with you," or "learning together") and the remaining post used the phrase "I'm excited to… work with you." The one post at the integration phase, occurring in

Module 2, consisted of the student connecting various examples from the readings with her own personal experiences. She concluded her post by saying that as she is learning she realizes that she's had "a lot of preconceived ideas" and that she "[looks] forward to learning more."

Each of the seven posts (six in Group A and one in Group B) with the facilitating discourse indicator of prompting discussion (TP-FD-5) was at the integration phase of cognitive presence. Three were the student's initial post for the module, and each generated a response from a peer. These three posts all had the cognitive presence indicator of connecting ideas (CP-IN-3) as they connected the reading to the student's personal experience. These posts culminated in drawing in participants (TP-FD-5) through either a question about resources or a prompt for students to further integrate the reading by categorizing themselves in one of the categories described in the text. Those posts that were in response to a peer's post began with agreement and building upon the idea (CP-IN-1) or sharing of similar experiences (CP-IN-3) and ended with either a question seeking resources or asking for suggestions on how to solve the problem that was raised.

The only post with the facilitating discourse indicator of identifying areas of agreement or disagreement (TP-FD-1) was at the exploration phase. In this post the student identified similarities with her peer and simply described her similar background (CP-EX-3).

Similarly, the only post with the facilitating discourse indicator of sharing an experience (TP-FD-7) was coded with the cognitive presence indicator of sharing a personal narrative without using it to support a conclusion (CP-EX-3). In this post, the student shared an experience with a particular program that she uses to teach Spanish as well as her experience at a conference to support the use of that program. She did not use this

information to support any conclusion, but as part of a narrative on her personal background and experience (in Module 1).

Direct instruction and cognitive presence. The final indicator present in the student discussion board posts that demonstrated both teaching and cognitive presence, and the only indicator outside of the facilitating discourse category, was the direct instruction indicator of injecting knowledge from diverse sources (TP-DI-6). Of the six posts (three in each group) demonstrating this indicator, three were at the exploration phase and the remaining three posts were at the integration phase. Two of the three posts that remained at the exploration phase were the student's initial post for the module. One of the integration phase posts was also the first for that student for the module, but this student shared experiences from her classroom to further demonstrate a point she made from quotes of the text. The student began with two quotes, then stated "After reading these statements, it brought to mind an article I read a few years ago in the New York Times [gave URL] discussing this topic" (TP-DI-6). She then went on to summarize the article and included a quote from it to connect it to the quotes from the reading. In addition to this integration of information (CP-IN-3), she followed with several examples of activities and observations from her classroom that demonstrated the points she was making, thus integrating yet another source of information in support of her ideas (CP-IN-3). The remaining three posts with a pointer to a resource (TP-DI-6) were all in response to a peer's post, and all at the integration phase of cognitive presence. Two of these were agreeing and/or building upon the post of a peer (CP-IN-1), one through sharing an assessment she uses and the other sharing the name and a description of a program used in her school. The remaining post, in response to a peer's example of "codeswitching," stated "I agree that it is somewhat a badge of honor to be able to codeswitch." She went on to explain

why she believed that and supported her assertion with an observation of what she has seen in the parents with whom she works. The post concluded with a pointer to a movie that brings to life "these types of language and culture clashes" (TP-DI-6).

Individual Student Comparisons

Examining the cognitive presence and teaching presence posts of individual students revealed interesting relationships. Table 17 summarizes the percentage of each student's total posts that had indicators of teaching presence as well as their rank within their group for evidence of teaching presence. It also summarizes the percentage of that student's posts that were at the cognitive presence integration phase, resolution phase, and composite integration and resolution, as well as their rank in their group for percentage of their posts that were at one of the higher levels (CP-IN and CP-RE) of cognitive presence.

While some students had a similar rank in their group for teaching presence and cognitive presence, others had a contrasting relationship. For example, Student 3 was highest in Group A for high-level cognitive presence posts but last in her group for teaching presence. Similarly, the student with the lowest rank for cognitive presence (i.e., Student 8, with equal percentage as Student 7) had the highest rank for teaching presence. Group B showed the same pattern of inverse relationships, with Student 4 having the highest percentage of higher level cognitive presence posts but no teaching presence posts. Likewise, Student 1 was less than 1% (i.e., one post) from the lowest in Group B for cognitive presence but was highest in her group for teaching presence, with three times the number of teaching presence posts than the next highest ranking student. In Group A, three students had a higher teaching presence rank than cognitive presence rank while three others had a higher cognitive presence rank

Table 17

Individual Student Teaching Presence and High Level Cognitive Presence

	Teaching Presence		Cognitive Presence			
Student	% of posts	Rank in Group	% at Integration	% at Resolution	% High Level CP	Rank in Group for High Level CP
Group A						
1	20.00	4	62.86	0.00	62.86	5
2	8.33	7	62.50	4.17	66.67	4
3	4.35	8	78.26	4.35	82.61	1
4	22.73	2	77.27	0.00	77.27	2
5	18.18	5	68.18	4.55	72.73	3
6	16.67	6	62.50	0.00	62.50	6
7	21.43	3	60.71	0.00	60.71	7
8	35.71	1	60.71	0.00	60.71	7
M	18.43		66.62	1.63	68.26	
Group B						
1	20.00	1	60.00	0.00	60.00	3
2	4.55	3	59.09	0.00	59.09	4
3	6.25	2	71.88	0.00	71.88	2
4	0.00	4	86.36	0.00	86.36	1
M	7.70%		69.33	0.00	69.33	

Note. High level cognitive presence (CP) = integration and resolution phases. Percentages are based on the individual student's total number of posts.

than teaching presence. The remaining two students had the same rank in their group for both presences. In Group B, one student had a higher teaching presence rank than cognitive presence, two had higher cognitive than teaching presence, and the remaining student had an equal rank for both teaching and cognitive presence. Overall, a moderate negative relationship was found between individual student levels of teaching presence and the percentage of posts at either the integration or resolution phase (r = -.51, p = .087). Examining the cognitive presence phases separately, a moderate negative relationship was also found between the percentage of teaching presence posts and the percentage of posts at the integration phase (r = -.49, p = .109), and a weak negative relationship between teaching presence and the percentage of posts at the resolution phase (r = -.26, p = .416).

RQ 2b. What Is the Relationship between Instructor Teaching Presence and Student Content-Based Cognitive Presence in the Discussion Forum?

As noted in Research Question 1, there was an observable and notable difference in how each instructor used the discussion board. The data presented below describe the teaching presence for each instructor in the discussion board and the interactions between the instructors and students as they relate to cognitive presence.

In their interviews, both instructors stressed the importance of students "engag[ing] deeply with the ideas." Instructor A elaborated, "What I want students to do is think about ideas. I want them to reflect on their values and beliefs with regard to the topic…." He appreciated seeing his students in this class "respond to the readings and respond to each other, push each other, challenge each other, extend each other's thinking and perspective and be really supportive of each other." Instructor B echoed these thoughts as he described the

email he sent to students at the beginning of the course to describe his expectations for the course.

> I asked my students, 'When you are reflecting for me, do your reflection, don't give me a summary of the book. I don't want that. I've read the book. I don't want a summary of the book. That's the author's viewpoint. Take the author's viewpoint and *own* it. Give me something from your own perspective. What have you learned as an ESL teacher from this book, and how can you apply that to your personal situation?'

These expectations were also articulated in the discussion board prompts and syllabus (identical for both instructors). The syllabus included three different sections providing direction for the discussion board: 1) a section in the "participation policy," 2) description in the "assignments" section, and 3) a grading rubric. The grading rubric articulated general expectations that the students should engage in "higher level" thinking such as "application, analysis, synthesis, and evaluation." However, the other two sections (i.e., the "participation policy" and the "assignments" section) included prompts that correlated with specific cognitive presence indicators. For example, students were prompted for a triggering event when directed to "ask a probing or clarifying question" (CP-TE-2). Students who include "well supported arguments" could be supporting their hypothesis (CP-IN-2) or even defending the method for solving a problem (CP-RE-2). Students who "expand on" the post of their peer would demonstrate convergence (CP-IN-1), while those who "validate" an idea with an example from their own experience would engage in synthesis (CP-IN-3). The clarity of the suggestion to "offer and support an opinion" leads students to developing and justifying a hypothesis (CP-IN-2) or even creating a solution (CP-IN-4) in contrast to the exploration phase of offering an unsupported opinion (CP-EX-6). On the other hand, some prompts could have led to different levels depending on the student's interpretation. For example, a student who "make[s] a suggestion" could just be exploring the possibilities (CP-EX-4) or even

brainstorming (CP-EX-5). On the other hand, a more developed post that integrates class materials or other information with the discussion could be creating a solution (CP-IN-4). Likewise, a student who "share[s] an insight" related to the peer's post could simply share another experience (CP-EX-3) or make a clear connection to the peer's experience and/or build upon it (CP-IN-3 or CP-IN-1).

The prompts that appeared in the discussion board each week also included phrases that could lead to different levels of cognitive presence. The prompt for Module 1, asking students to "post a reflection on the experiences/people/factors…" influencing their language development, could have led students to integrate ideas and develop a hypothesis about what influences language development (CP-IN-2). Although there was no assigned reading for this module, a student may have also integrated other information, such as an article or book, with their experiences (CP-IN-3). However, the prompt went on to ask the students to also "share something" about their goals and aspirations. It also made a general statement about the purpose of the activity (TP-DE-6), "to get to know each other and for you to look back…." Because all of the posts (in both groups) responding to this prompt were coded at the exploration phase, students may have interpreted this to mean that they were to just share personal narratives and exchange information about their background (CP-EX-3, 100.00% in each group).

The discussion prompt for Modules 2-8 was identical for all weeks. The prompt indicated that the post was to exhibit "critical, personal engagement with the issues" in the readings and to wrestle with them both intellectually and practically. It clearly prompted students to integrate information and connect ideas (CP-IN-3) as they were directed to "incorporate reflections" on where their experiences "intersect" with the topics in the

readings. The student cognitive presence data reveal that, of the posts exhibiting cognitive presence, 36.87% (*f* = 73) of the posts in Group A and 35.92% (*f* = 37) in Group B demonstrated the CP-IN-3 indicator. Other posts discussed a personal experience but did not make a clear connection with the readings, discussing where, how or why they intersect. These posts were at the exploration phase (CP-EX-3; *f* =20, 10.10% of the cognitive presence posts in Group A; *f* =13, 12.62% in Group B).

The directions for responding to peers did not appear in the discussion board each week, but were articulated in the syllabus. This "assignment description" directed students to "respectfully engage" with the ideas of their peers, whether "agreeing with them or challenging them." A student expressing agreement or "resonances" with a peer, if offering substantiation for her agreement, would demonstrate the integration indicator of convergence (CP-IN-1). Of the posts with cognitive presence, 33.83% (*f* = 65) of the posts in Group A and 33.98% (*f* = 35) in Group B exhibited this indicator. The coding scheme did not address posts expressing unsubstantiated agreement, but only unsubstantiated disagreement (CP-EX-1; *f* = 0 in both groups). However, each time a student agreed without substantiation she also presented different themes in the same message (CP-EX-2; *f* = 9 in each group, 4.55% of Group A's cognitive presence posts and 8.74% of Group B's), brainstormed (CP-EX-5; *f* =8, 4.04% in Group A; *f* =5, 4.85% in Group B), or leapt to a conclusion (CP-EX-6; *f* =8, 4.04% in Group A; *f* =5, 4.85% in Group B). The syllabus directive further encouraged students to offer recommendations. These could also have been in the form of brainstorming (CP-EX-5), offering a suggestion for consideration (CP-EX-4; *f* = 2, 1.01% in Group A; *f* = 2, 1.94% in Group B), or a solution to the problem (CP-IN-4; *f* = 16, 8.08% in Group A; *f* = 6, 5.83% in Group B).

As seen in the results pertaining to RQ 1b, Instructor A had a much higher level of teaching presence in the discussion board than Instructor B (*f* = 144 posts and *f* = 9 posts, respectively). Table 18 shows the percentage of total student posts at each cognitive presence phase in each instructor's class (i.e., Group A and Group B). As seen in Figure 7, except for Group A reaching the resolution phase in 1.46% of their posts the groups had similar levels of cognitive presence within their group for the discussion board.

Threading of Posts

The interactions between Instructor A and students were further analyzed by examining the threading of posts in the discussion forum. Because only study participants' posts were available to the researcher, the instructor's posts in response to a non-participant were not included in this analysis. This resulted in 66 instructor posts for consideration. Because the instructor posted after each module had concluded, the first analysis explored relationships between the cognitive presence phase of the student post and the category of teaching presence in the instructor's response. The predominant combination was student posts at the integration phase that prompted a direct instruction response from the instructor (*f* = 31, 46.97% of the instructor's responses to study participants). Only six student posts at the exploration phase elicited a direct instruction response from the instructor (9.09% of his responses). The remaining 14 student posts at the exploration phase generated a facilitating discourse response (21.21% of his responses). However, it should be noted that eight of these posts occurred in Module 1 primarily with the student sharing personal experience (CP-EX-3) and the instructor responding by acknowledging or reinforcing the contribution (TP-FD-3), sharing a similar experience (TP-FD-7) or asking a question about something in the student's

Table 18

Number of Student Cognitive Presence Discussion Board Posts for Each Instructor

	Cognitive Presence Phase											
	Triggering Event		Exploration		Integration		Resolution		No CP Observed			
Instructor	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	Total	
A	1	(0.49)	58	(28.16)	136	(66.02)	3	(1.46)	8	(3.88)	206	(100.00)
B	1	(0.94)	29	(27.36)	73	(68.87)	0	(0.00)	3	(2.83)	106	(100.00)

Note. No CP observed = posts with no indicator(s) of cognitive presence phases observed.

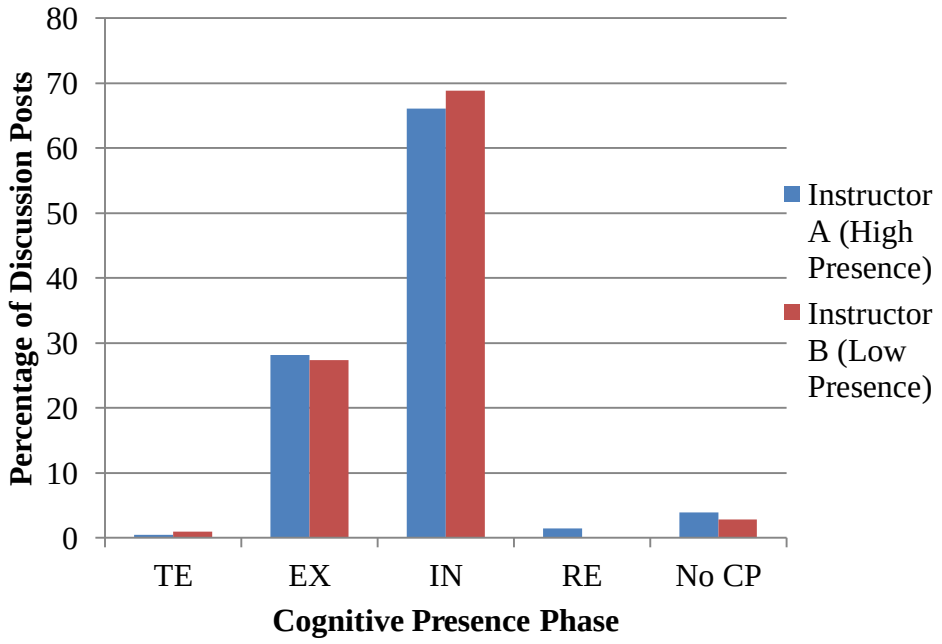

Figure 7. Student cognitive presence in the discussion board for each instructor. Instructor A had a high level of teaching presence in the discussion board, and Instructor B had an observably lower level. Bars represent the percentage of that group's total posts that exhibited indicator(s) of that phase.

post (TP-FD-5). Eleven additional instructor facilitating discourse posts (16.67% of Instructor A's posts to study participants) responded to student posts at the integration phase. The remaining four instructor facilitating discourse posts (6.06% of his responses) replied to student posts that did not have cognitive presence indicators.

Only two of the instructor's posts generated responses from the student. These had similar patterns in the initial interaction. In both cases the student posted content at the exploration phase of cognitive presence. The instructor responded with a facilitating discourse post. In both cases he acknowledged and reinforced the contribution (TP-FD-3) and prompted discussion (TP-FD-5) by asking for more detailed information on something the student had shared. Neither instructor post led the student to respond at the integration phase. Instead, the responses did not have any cognitive presence indicators, only teaching presence. One student responded to the instructor's request for a resource with a direct instruction post sharing a web link (TP-DI-6). The other responded to the instructor's question by describing an experience she had presenting at a conference (TP-FD-7). None of the other study participants responded to the instructor's posts.

RQ2c. What Is the Relationship Between Instructor Teaching Presence as Demonstrated by Multiple Data Sources and Student Content-Based Cognitive Presence in Final Projects?

To explore the relationship between instructor teaching presence throughout the course and the students' levels of cognitive presence in the culminating paper, this section first provides some brief descriptions of instructor teaching presence that could have prompted higher-order thinking in students. General examples of the established climate for learning as well as specific content addressing the paper are provided. The students'

performance on their papers is then discussed, including both a description of cognitive presence levels present as well as examples from the papers.

Instructor Teaching Presence

In addition to examining the instructions for the specific project assignment, other materials used in the class offer insight into the climate that was established and the expectations for students' interaction with the course materials. The instructors' directives for the discussion board, both in the syllabus and in the prompts, were presented in RQ 2b. In the grading feedback, Instructor B reinforced the expectation of integrating information when he praised students for "connect[ing] [their] responses to the readings." Using the announcement tool in Blackboard, Instructor A offered more general statements of reinforcement, praising "thoughtful responses to the readings" and their "depth of engagement" with the materials.

Expectations for cognitive engagement for this specific project were offered in the syllabus assignment section (and an identical posting of this content in the assignment section of Blackboard), in the grading rubric, and by Instructor A in an announcement the week before the paper was due. In the syllabus and the directions posted on Blackboard the project was called a "critique." This would imply that the student was to go beyond the exploration phase of exchanging information (CP-EX-3) to the integration phase of connecting ideas by integrating information from sources such as their school's web site, their classroom experience, and course content (CP-IN-3) as well as presenting some kind of conclusion, such as a hypothesis (CP-IN-2). The directions themselves, however, included prompts at different levels. Several statements prompted students to share facts and personal descriptions as they "present an examination" of written information from their school district, observations of

district practice, and student outcomes. All students began their papers by presenting a narrative and facts about their school district (CP-EX-3). Other parts of the directions prompted students to analyze, synthesize and integrate these facts as they evaluated them in light of their own personal philosophy and student needs. Finally, the prompt asked students to describe what they would change about the model or practice, thereby creating a solution (CP-IN-4) or even defending why that solution was appropriate (CP-RE-2). Instructor A elaborated on this directive in an announcement offering more detail on the expectations. He noted specific kinds of facts to share about the school districts, comparisons and contrasts to be made, value judgments to be articulated on whether particular things were the "most appropriate" or serving students "well," the appropriateness of the methods for the particular student population, and whether the materials support the methods. Students were also to offer their assessment of their students' levels of "enjoy[ment]" of school as well as feelings of "value" and equality.

The grading rubric reveals that a high value was placed on the descriptive portion of the task. Of the 25 possible points for the paper, 16 addressed "good description[s]" of the school demographics, policies, resources, student outcomes, and what the programs were like in practice. The remaining nine points were divided between tasks at the integration and resolution phase. Six of the points were students synthesizing information as they evaluated whether the programs were both appropriate and congruent with the policies and their personal philosophies. The final three points prompted students to create a solution by describing what they would change. While this was at the integration phase, several students also defended their solution and reached the resolution phase.

Student Cognitive Presence in Final Projects

As seen in Figure 8, most of the students in both groups reached the levels of integration and resolution in their final projects. Only one student in each group (12.50% of Group A and 25.00% of Group B) remained at the exploration phase of their final projects. Five students (62.50%) in Group A and one student (25.00%) in Group B concluded at the integration phase. The remaining students (n = 2, 25.00% in Group A; n = 2, 50.00% in Group B) reached the resolution phase.

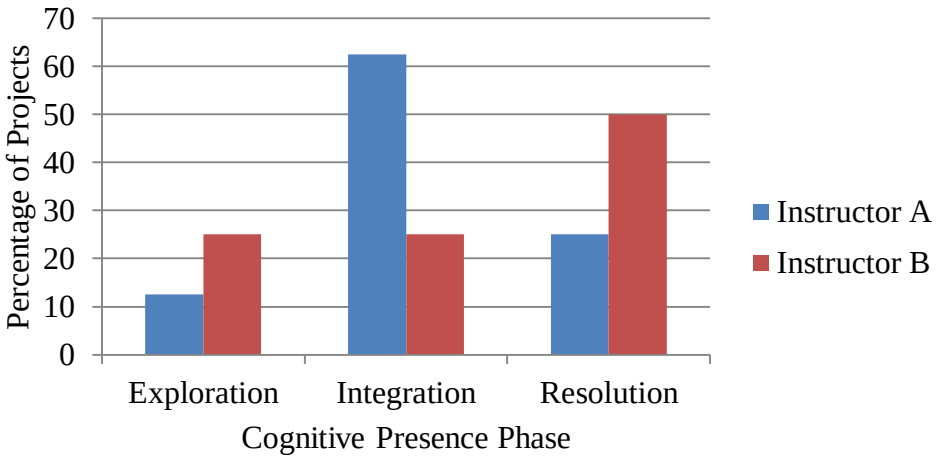

Figure 8. Percentage of students reaching each cognitive presence phase in their individual projects. Data is shown in percentage of the group due to the difference in sample size.

An interesting pattern of relationship between the data for individual students reaching the integration and resolution phase in the discussion board and those meeting these levels in their final project is shown in Table 19. None of the students who reached the resolution phase in their projects had also reached that phase in any of their discussion board posts. In

Table 19

Student Cognitive Presence in Discussion Board and Final Project

Student	Discussion Board				Project
	% posts at Integration	% posts at Resolution	% posts at High Level CP	Rank in Group for High Level CP in Discussions	
Group A					
1	62.86	0.00	62.86	5	Integration
2	62.50	4.17	66.67	4	Exploration
3	78.26	4.35	82.61	1	Integration
4	77.27	0.00	77.27	2	Integration
5	68.18	4.55	72.73	3	Integration
6	62.50	0.00	62.50	6	Integration
7	60.71	0.00	60.71	7	Resolution
8	60.71	0.00	60.71	7	Resolution
M	66.62	1.63	68.26		
Group B					
1	60.00	0.00	60.00	3	Resolution
2	59.09	0.00	59.09	4	Integration
3	71.88	0.00	71.88	2	Exploration
4	86.36	0.00	86.36	1	Resolution
M	69.33	0.00	69.33		

Note. Percentages shown are the percentage of the student's total posts. Project data are the highest phase exhibited by the student in her class project. High level CP = integration and resolution phases of cognitive presence.

fact, one of the students who did reach the resolution phase in the discussion board for Group A did not even reach the integration phase in her paper, and remained at the exploration phase.

However, summarizing each paper with only one phase may imply that many of the papers that demonstrated similar levels of higher-order cognition when, in fact, within a cognitive presence phase there was a great variation in levels of depth of thinking. This was especially true of the papers coded at the integration and resolution phase. Some brief examples from the papers illustrate this point.

The two papers at the exploration phase (one in each group) primarily addressed the grading rubric points of providing a "good description" of the district and school demographics, policies and programs (CP-EX-3). In one paper, this made up more than four of the five and one-half pages. The description was sometimes followed by an unsupported opinion (CP-EX-6). For example, after the student described her district's programs she stated, "In my opinion, English language learners should never be pulled out during academic time for services, nor should they miss out on recess, library time, or other enhancement activities just for services." No statement of support was added for this opinion. One student did offer solutions or suggestions (e.g., "I would also like to see professional development…" or "I believe all ELL students in the high school should have…") but did not defend, justify, or develop them. Therefore this post was coded as brainstorming (CP-EX-5) and not an integration phase indicator such as presenting a justified, developed yet tentative hypothesis (CP-IN-2) or creating a solution (CP-IN-4).

At the integration phase most papers only had one or two examples of integrating the text or an article with their observations. They cited information from the textbook and

integrated it with their experiences as they assessed their district's program or described a practice in their school that was congruent with the ideal presented in the text. However, the remaining parts of the paper were either lengthy descriptions (CP-EX-3) or unsupported suggestions (CP-EX-4). In fact, four of the five integration phase papers in Group A and the integration phase paper in Group B were characterized by this minimal evidence of integration. In some papers the students would use additional quotes but fail to connect them to the points being made. For example, one student concludes by describing a concern about a need that is developing in her school and raises a question, but offers no solution to the issue. Further, she inserts a quote that doesn't answer the question:

> What steps could we take to ensure the proper education of that student? According to the textbook, 'One conclusion is that change will always occur…' [cites reference]. The hope is that this change will be positive and serve all of our student population.

Another common characteristic of the integration phase papers was the presentation of a description of the problems present in the district but a failure to present solutions. In fact, even papers with more than one example of integrating text and experience, while coded at the integration phase, gave the reader the feeling of sitting in the teacher's lounge on a dark, dreary, rainy day. The sun is not shining, the children can't go outside for recess, but there's nothing we can do about it! One student integrated the district materials and her observations with four different references to or quotes from the textbook, but concluded that many of the district's students simply could not be served properly:

> Considering the circumstances that this school system is in the US and is on a public budget, no change can realistically be made…It would be neither practical nor feasible to attend to the multiple minority languages in the community. From a fiscal perspective, it is not practical…Therefore, the minority languages, other than Spanish must fall to the wayside in the US education system…."

Similarly, another student concluded, "From looking into options at [my private school], as much as I hate to say it, it would be best for the student to attend the public school a few blocks away rather than a private school…." This student did achieve the integration phase by integrating two references from an article used in the course and one from the textbook (CP-IN-3), and even offered a solution (CP-IN-4). However, the solution was the antithesis of her recognition of lack of resources and no rationale or supporting statements were offered for it. Again, when looking for problem solving and presenting a solution with support for why it would work or how to implement it, a clear void was present.

In the one paper with strong indicators of integration, the student integrated official policy from the school district web site with her observations as she provided a quote from district policy and called it a "misnomer" in relationship to the reality of resources offered for students (CP-IN-3). She also integrated quotes from the textbook in her evaluation of the programs. For example, she quoted the textbook's description of what is possible followed by the statement, "Unfortunately, this practice is neither utilized nor encouraged throughout the classrooms of [my district], more than likely due a [*sic*] lack of knowledge in how the native language influences the second language [another citation of the text]." The paper goes on to offer suggestions for solutions to the problem (CP-IN-4), but stops short of resolution phase processes of describing possible ways to implement the solutions or even defending the solutions as possibilities to consider. In fact, she concludes that "Unfortunately, with recent budget cuts, I am not confident that this support will occur."

The four papers reaching the resolution phase did present solutions with suggestions for how to implement them (CP-RE-1), defense of why that would be an appropriate solution (CP-RE-2), or both. One student presented several solutions throughout her paper. For

example, she describes her concern about the placement of ELL students in her district. She explains that there are assistants or teachers in the building who are fluent in the same languages as some of the students, but they are not matched in the same classroom. She suggests that the district should utilize the "natural resources" available to it by placing students in the classroom of a teacher who shares their culture and language, when available. The paper goes on to defend why this would be a good solution (CP-RE-2), as well as presenting potential obstacles to its success. Another student suggested that she would like to see her district have "more regular education teachers throughout the school trained on having an ELL student in their classroom." She supported this proposal with both a suggestion for how it could occur (i.e., "offer more professional development or even have teachers get their ELL endorsement") as well as a rationale for why it would benefit the students.

Teaching Presence in Instructor Feedback

Instructor feedback on the papers, found in the grading tool of Blackboard, revealed no clear pattern of relationship between the phase of cognitive presence in the paper and the category of teaching presence in the response. Each of Instructor A's feedback posts had a reinforcing indicator (TP-FD-3), both acknowledgement of a specific part of the paper (e.g., "Thanks for including…" or "Thanks for quoting…") and general concluding statements (e.g., "Great job here!," "Nice job!," or "Excellent job"). Each also had several opinion statements, reactions, or both. Many of the opinions began with phrases like "I'm glad…," "I like the idea…," or "I hope…." The reactions often included an observation, summary of the student's content, or a statement of empathy for the student. For example, for one student he observed "Your district is very impressive in its academic results." Others had a general

reaction to a particular part of the content, such as "interesting…" or "What a lovely story…." For another he summarized part of the content (i.e., "It sounds like your district offers a variety of programs…"). Many of the comments expressed understanding of or empathy for the student's challenges (e.g., "I'm sorry you're seeing…," "Oh dear, I can see how…," or "I feel terrible for…"). This instructor also asked many questions of clarification. Five of the eight papers had one or more questions of clarification or sought more information.

Papers at a particular level of cognitive presence did not elicit a specific corresponding teaching presence category response. The exploration phase paper had only facilitating discourse indicators (i.e., reinforcing contributions, TP-FD-3 and prompting discussion, TP-FD-5). Three of the integration phase papers also received facilitating discourse responses, all with only indicators of TP-FD-3 and TP-FD-5. The feedback posts to the remaining four papers in Group A (two at the integration phase and two at the resolution phase) were primarily confirming understanding through assessment and explanatory feedback (TP-DI-4). Three of these also had one or both of the facilitating discourse indicators (i.e., TP-FD-3 and TP-FD-5). However, they were primarily marked with phrases of evaluation such as "It's true," "You're right," and "Yes, ..." followed by explanation of concepts students had misunderstood or offering additional information.

Instructor B posted the same feedback to all students for their paper, "Your examination of your district's model for ESL/bilingual education as written and in practice was very succinct. You also presented an objective critic [*sic*] of your district's program." These were considered acknowledging or reinforcing the contribution (TP-FD-3) and did not correspond to any particular level of cognitive presence since one was at the exploration phase, one at the integration phase, and two at the resolution phase.

Research Question 3

At the end of the course, students completed the Community of Inquiry Survey (Arbaugh et al., 2008) along with five open-ended survey questions added by the researcher. This section describes the relationship between the survey results and the content-based data from the class sections in response to Research Question 3 (RQ3), "What is the relationship between student-reported cognitive presence and content-based cognitive presence?" Specifically, two relationships were examined:

RQ 3a. What is the relationship between student-report cognitive presence and content-based cognitive presence in the discussion forum?

RQ 3b. What is the relationship between student-reported cognitive presence and content-based cognitive presence in the final projects?

The examination of these questions begins with a description of the student responses in the CoI survey. The cognitive presence data for the discussion board are then compared to this data, followed by a comparison of the CoI responses and the cognitive presence data for the final project.

CoI Survey Results

To summarize the perceptions of cognitive presence for each of the groups, a mean score was computed for each individual student and a group score was computed by calculating the mean of the individual students' means. Because the responses were based on five-point Likert items, a response of 4 or 5 indicated that the student *agreed* (i.e., 4) or *strongly agreed* (i.e., 5) with the statement. The scores on each question were clustered in the

groups of questions at each of the phases of cognitive presence. Items 23 through 25 were questions corresponding to the triggering event phase:

23. Problems posed increased my interest in course issues.
24. Course activities piqued my curiosity.
25. I felt motivated to explore content related questions.

Items 26 through 28 corresponded to the exploration phase:

26. I utilized a variety of information sources to explore problems posed in this course.
27. Brainstorming and finding relevant information helped me resolve content related questions.
28. Online discussions were valuable in helping me appreciate different perspectives.

Items 29 through 31 addressed the integration phase of cognitive presence:

29. Combining new information helped me answer questions raised in course activities.
30. Learning activities helped me construct explanations/solutions.
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.

Items 32 through 34 corresponded to cognition at the resolution phase:

32. I can describe ways to test and apply the knowledge created in this course.
33. I have developed solutions to course problems that can be applied in practice.
34. I can apply the knowledge created in this course to my work or other non-class related activities.

Table 20 summarizes the mean score for each group at each phase of cognitive presence using the valid survey responses (n = 6 in Group A and n =4 in Group B). It also presents a composite score for each group's cognitive presence at a "low" phase (i.e., triggering event and exploration) and at a "high" phase (i.e., integration and resolution). As Figure 9 demonstrates, Group B's perceptions of cognitive presence scores (i.e., scores on the survey items) were slightly higher than Group A's in all phases. While the mean score in

both groups was "agree" (i.e., $3.5 < M > 4.5$) for all phases, both groups had slightly less agreement in the lower phases of cognitive presence than in the higher.

Table 20

Mean Scores on the Community of Inquiry Survey – Perceptions of Cognitive Presence

Group	Low Levels				High Levels				
	Triggering Event	Exploration	Low Levels Combined		Integration	Resolution	High Levels Combined		All Levels Combined
A	3.83	3.94	3.89		4.28	4.22	4.25		4.07
B	4.25	4.08	4.17		4.33	4.42	4.38		4.27

Note. Scores are the mean scores for the three CoI survey items corresponding to each phase of cognitive presence. Low levels combined = mean of all triggering event and exploration items; High levels combined = mean of all integration and resolution items; All levels combined = mean of the 12 cognitive presence items combined. All were Likert items on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

An examination of individual scores reveals further information on student perceptions. Only one student (in Group A) had a composite mean score for all cognitive presence items of less than *agree* (i.e., < 3.5). This student's overall score was in the *neutral* range ($M = 2.8$), with a *disagree* response to three of the six items in the triggering event and exploration phases ($M = 2.5$). In the integration and resolution phases, she was at a *neutral* level ($M = 3.2$). Two other students in Group A each had an average in the *neutral* range for one cognitive presence phase, one in the triggering event phase ($M = 3.3$) and the other in the exploration phase ($M = 3.3$). Both of these students were in agreement ($M = 3.5$) in all other

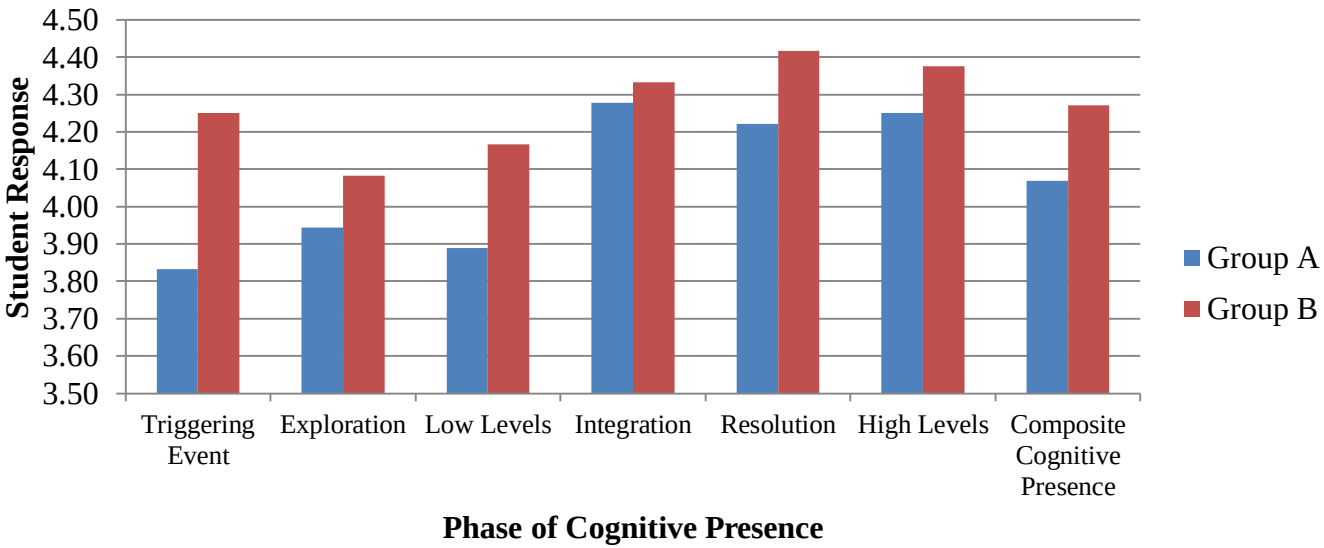

Figure 9. Mean Perception Scores for CoI Survey Cognitive Presence Items.

Note. Student perceptions of cognitive presence as measured by mean scores on the Community of Inquiry Survey cognitive presence items (i.e., items 23-34). Mean scores were calculated using responses to the three CoI survey items corresponding to each phase of cognitive presence. Low levels = mean of all triggering event and exploration items; High levels = mean of all integration and resolution items; All levels combined = mean of the 12 cognitive presence items combined. All were Likert items on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

phases. Group B had only one student with a *neutral* average, in both the exploration and resolution phases (M = 3.3 in each). This student agreed in the triggering event (M = 3.7) and integration phases (M = 4.0). The remaining students in both groups either agreed or strongly agreed at all phases of cognitive presence. In Group A, one student agreed in all phases, except in integration where she strongly agreed. In Group B, one student agreed in the triggering event and exploration phases (M = 4.2) and strongly agreed in the higher levels (i.e., integration and resolution, M = 4.7). The third student agreed with items in the first three phases (M = 4.3, 4.3, and 4.0, respectively) and strongly agreed in the resolution phase (M = 4.7) statements. Two students in Group A and one in Group B were in strong agreement with all cognitive presence items.

RQ 3a. What Is the Relationship Between Student-Reported Cognitive Presence and Content-Based Cognitive Presence in the Discussion Forum?

Table 21 presents the percentage of each group's discussion board posts at each phase according to the content analysis as well as the mean scores on the CoI survey. The most evident contrast is found in the resolution phase in both groups. While only 1.46% of the posts in Group A and 0.00% of the posts in Group B reflected the resolution phase, the group as a whole expressed agreement that they could perform the tasks at the resolution phase on the survey. Looking at individual scores, five of the six students completing the survey in Group A agreed that they "could describe ways to test and apply" knowledge, "have developed solutions," and "can apply" the knowledge but only three students (all in Group A) actually demonstrated these skills in the discussion board. Further, each of these students only had one post at the resolution phase (out of 22, 23, and 24 total posts). None of the

students in Group B actually reached the resolution phase in the discussion board, while three of the four agreed that they could or had exhibited such skills in the class.

Table 21

Discussion Board Content Analysis and CoI Survey Perceptions of Cognitive Presence

	Cognitive Presence Phase							
	Triggering Event		Exploration		Integration		Resolution	
Group	Content-based %	*M*	Content-based %	*M*	Content-based %	*M*	Content-based %	*M*
A	(0.49)	3.83	(27.67)	3.94	(66.50)	4.28	(1.46)	4.22
B	(0.94)	4.25	(27.36)	4.08	(68.87)	4.33	(0.00)	4.42

Note. Content-based % = percentage of the group's total discussion board posts that reached that phase; *M* = mean score for the three survey items corresponding to that phase. Content-based percentages are based on all study participants (n = 8 in Group A, n = 4 in Group B); Perceived means are based on valid survey responses (n = 6 in Group A, n = 4 in Group B). Discussion board posts were recorded in the highest phase with indicator(s) observed. Student perceptions of cognitive presence as measured by mean scores on the Community of Inquiry Survey cognitive presence items (i.e., items 23-34). All items were based on a Likert scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

It is also interesting to note the number of responses for items in the triggering event and exploration stages that were *neutral* (f = 11, 18.33% of the combined groups' responses) or *disagree* (f = 4, 6.67%) in contrast to the *neutral* (f = 5, 8.33%) or *disagree* (f = 1, 1.67%) responses for items in the integration and resolution phases. In Group A, three of the six respondents agreed or strongly agreed on all integration and resolution items, but were neutral or expressed disagreement with one or more of the triggering event and exploration phase items. While one student in Group B did respond as "neutral" on multiple items, these were

at both lower and higher level phases. Because the higher level phases "borrow characteristics" (Garrison et al., 2001, p. 17) from the lower phases and the coders followed the practice of "coding up" (p. 17) when multiple phases were present, students who reached the integration phase are assumed to have also achieved the lower phases for that post. Therefore, students who perceived that they engaged in the higher level skills should have also engaged in the lower level phases.

Student responses on the open-ended survey questions provide further insight into student perceptions of both the course and their performance. When asked what aspects of the course were most helpful to them in learning, in "integrat[ing] new information with prior learning" (i.e., integration phase) or "creat[ing] and test[ing] solutions to related problems" (i.e., resolution phase), five of the ten respondents pointed to the discussion board. One student stated that "the readings and good discussion helped me to better understand the concepts." Another noted that the discussions, along with the textbooks and articles, gave her many ideas for how to teach ELL students. She went on to discuss integrating the course material into practice when she predicted that she will "utilize" and "incorporate" it into her teaching.

Instructor A echoed these ideas when he discussed his assessment of whether students could apply the material to another situation. Noting that the students were all practicing teachers and that what they were "reading and thinking about has a direct relationship to what they're doing every day," he believed that the students were led to "consider the implications of what they're learning for what they're doing."

RQ 3b. What Is the Relationship Between Student-Reported Cognitive Presence and Content-Based Cognitive Presence in the Final Projects?

Because the CoI survey questions do not focus specifically on the discussion board, the content-based data from the final project were also compared to the student survey results. This was a paper that was due in Week 6 of the eight-week course. Similar to students pointing to the discussion board as the most helpful aspect of the course, four students pointed to the paper. Two of these students had also found the discussion board to be helpful, but one felt that the project contributed to her learning while the discussion board hindered it. She explained:

> I would have posed a specific question for each week… or at least have everyone post about the same chapter. To be honest, I rarely read what I was supposed to read because I only had to come up with a short paraphrase of something that stood out to me. I got away with doing very little, which in turn, meant I learned very little.

However, this student felt that the paper required her to use her knowledge from other courses as well as the material in this course to "make sense of" the policies and practices in her school district. Another described the paper as what "really opened [her] eyes to what [she] believe[s] out to be done to help all of [her district's] students."

As described in RQ 2c, there were students who did not reach the resolution phase in their discussion posts but did reach it in their paper, and vice versa. In fact, there were no students who reached the resolution stage in both the discussion board and their paper. As Table 22 shows, considering a student to have reached resolution phase if she demonstrated it at *any* time in the course, whether in one discussion post or in the final paper, brings the content-based data closer to the student perceptions.

Table 22

Students Reaching the Resolution Phase in Content-Based and Perception Measures

	Content-Based Measures				Perception Measure
Student	Discussion Board Reached Resolution	Phase of Project	Reached Resolution Overall	Content-Based %	CoI Survey %
Group A					
1	No	IN	No	62.50	83.33
2	Yes	EX	Yes		
3	Yes	IN	Yes		
4	No	IN	No		
5	Yes	IN	Yes		
6	No	IN	No		
7	No	RE	Yes		
8	No	RE	Yes		
Group B					
9	No	RE	Yes	50.00	75.00
10	No	IN	No		
11	No	EX	No		
12	No	RE	Yes		

Note. Content-based % = percentage of the group exhibiting resolution phase indicator(s) in either the discussion board or individual projects; CoI survey % = percentage of students in the group responding "agree" or "strongly agree" on CoI survey items corresponding to the resolution (i.e., composite of $3.5 \leq M \leq 5$ on items 32-34). All items were based on a Likert scale of 1 (Strongly Disagree) to 5 (Strongly Agree). Content-based percentages are based on all study participants ($n = 8$ in Group A, $n = 4$ in Group B); Perceived means are based on valid survey responses ($n = 6$ in Group A, $n = 4$ in Group B).

The two students (one in each group) who were "neutral" in their perception of achieving the resolution phase items also lacked an emphasis on application of material in their response to the open-ended question, "How will you use the information you learned in this course in other situations, such as your future vocation or in other course(s)?" One of these students indicated that the course had primarily made her "more aware of bilingualism and what it means to so many" and given her a "new appreciation for multilingual families and students." The other student also pointed to awareness as her application of course material as she shared that this course (and "all of the courses in general so far") had made her "think about language in general on a daily basis." While another student began by stating that she would apply knowledge from this course "in other courses and… in [her] classroom with [her] own students," she pointed primarily to an affective benefit from the course:

> This class allowed for a new perspective to be formed. It is allowed for the [ESL] student perspective to shine as opposed to what we as educators see. I really feel as though my own thoughts on the ESL child [*sic*] changed and it is for the better.

Interestingly, most of the students who expressed agreement or strong agreement about being able to apply the knowledge made general statements about *how* they would use what they had learned in the course in other situations. For example, one student simply said that she applies what she learns in each course to her "current teaching position, working with ELL students." Similarly, another student said that she would "utilize the information in [her] ELL classes to better support [her] students' needs." Yet another student indicated no immediate plan for using the knowledge, but that she would incorporate the "tips" from other students along with the textbook information "once [she] complete[s] the ELL courses and begin[s] to utilize the new certifications." Only two students emphasized specific knowledge they had gained and how it would be used in a specific situation. For example, one student

declared that she is now "more knowledgable [*sic*] of the History of ESL and Perspectives on it" which would help her in working with both children and administration. Another pointed to what she had learned about different learning styles, noting that she would use that to help ESL students learn and to help their parents in supporting their child's success.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

Nearly fifteen years after the Community of Inquiry (CoI) framework was first published as a template or tool for researchers to use in examining the dynamics of critical thinking in an online course, the article outlining this framework (Garrison, Anderson, & Archer, 1999) has arguably become the most widely studied model for understanding online learning. Although the framework was also designed to guide educators in "optimal" (Garrison et al., p. 87) use of online conferences to facilitate learning, the amassment of research has met with criticism for a failure to link CoI processes to learning outcomes (Maddrell, 2011; Maddrell, Morrison, & Watson, 2011; Rourke & Kanuka, 2009; Xin, 2012). This study responded to that criticism as well as to the recognition by both those who developed the model (Garrison, Anderson, & Archer, 2010) and others who support it that studies linking the CoI process to learning outcomes are necessary (Akyol & Garrison, 2011b; Garrison, Cleveland-Innes & Fung, 2010). The goal of the present research was to examine specifically the relationship between teaching presence and cognitive presence as both a process and an outcome.

This chapter discusses the findings presented in Chapter 4 and offers conclusions based on these data. The chapter addresses the development of teaching and cognitive presence over time, the relationships between teaching and cognitive presence, and interpretations of the Community of Inquiry survey data. The chapter then summarizes the

limitations of this study as well as its unique contributions to the literature. Recommendations for future research that emerged from the study are also offered. Finally, a brief summary of the study and conclusions are presented.

Discussion of Findings

This section discusses the findings on the development of teaching and cognitive presence over time, including student teaching presence in the discussion board, instructor teaching presence in both the discussion board and in other instructional materials (i.e., course syllabus, announcements, assignment instructions, and grading feedback), and student cognitive presence in the discussion board and in a course project. Relationships between teaching and cognitive presence are considered in individual student data, group data, and instructor data. Finally, relationships between the survey data and the content-analysis data are reviewed.

Development of Teaching Presence and Cognitive Presence Over Time

Although the CoI framework proposes that both instructors and students exhibit each of the presences, the findings of this study (albeit influenced by the rubrics established by the coders for determining whether a particular unit of content was exhibiting teaching or cognitive presence) are consistent with delineations that have emerged in the literature. First, while students engage in teaching presence, it has generally been assumed to be primarily the role of the instructor (Anderson, Rourke, Garrison, & Archer, 2001; Arbaugh et al., 2008; Garrison et al., 1999; Garrison & Cleveland-Innes, 2005; Shea, Li, & Pickett, 2006) and was predominantly exhibited by the instructors in the two class sections in this study. Secondly,

student posts were primarily characterized by cognitive presence indicators. This section summarizes the findings for both presences for students and instructors.

Teaching Presence

Due to the methods established in this study for application of the coding schemes (i.e., instructors only coded as teaching presence or "no teaching presence observed" and students coded primarily as cognitive presence), it is not surprising that, as a whole, students accounted for only 17.31% of the total teaching presence in the study. Although Arbaugh (2007) was referring to student perceptions, the content analysis data in the present study corroborate his conclusion that we may be evaluating "teach*er* presence" (p. 81, emphasis added) rather than teach*ing* presence. This is especially evident if examining the discussion board data, where all participants had equal opportunity to engage in teaching presence, particularly in Group A, in which only 40 student discussion posts exhibited teaching presence (19.42% of the total posts), while the instructor had 144 teaching presence posts. In contrast, in Group B the students and instructor had an equal number of discussion board posts (f = 9, 8.49% of the total student board posts) exhibiting teaching presence. However, this was due in part to the instructor's practice of using the individual grading feedback section to respond to students and not the public discussion board forum.

The categories of teaching presence most frequently exhibited in the discussion board also differed between students and instructors. Instructor A most frequently posted in the direct instruction category, followed by facilitating discourse, but the students showed the opposite. This instructor pattern mirrored the findings of Anderson et al.'s (2001) examination of instructor discussion board posts while developing the coding scheme. In

contrast, Instructor B primarily posted design and organization content followed by facilitating discourse. However, this should be interpreted by remembering that eight of the nine (88.89%) posts for the instructor were the discussion board prompts from the course template. Because these gave directions for the student posts, they were in the design and organization category. Group B students mirrored the students in Group A by posting primarily in the facilitating discourse category, followed by direct instruction. Further, in both groups the primary category of teaching presence posts remained consistent throughout the course. While student data demonstrating a virtual lack of design and organization are consistent with the evaluation of student discussion board data by Akyol and Garrison (2008), the data in the other categories contrast. In the present study, students in both groups exhibited higher levels of facilitating discourse than direct instruction for the duration of the course. Akyol and Garrison found higher levels of facilitating discourse in the first three weeks, but a significant shift to direct instruction in the last six weeks of a nine week course. The lack of direct instruction in the present study could have been due to the unchanging, and therefore non-content specific, discussion prompt or the type of instructor involvement.

Considering all sources of instructor activity, Instructor A's pattern of content by teaching presence category remained the same as in the discussion board (i.e., direct instruction had the highest frequency, followed by facilitating discourse and design and organization). However, Instructor B shifted to primarily facilitating discourse, followed by design and organization and direct instruction. Instructor B's high level of design and organization was due to his amount of participation (31.03%) through the course template materials (i.e., syllabus, assignment instructions, and discussion board prompts) that were primarily coded in the design and organization category. Because the design and organization

content in the syllabus accounted for 17.24% of his total participation in the course, an examination of total teaching presence after Week 1 reveals that both the students and the instructor in Group B, like the students in Group A, primarily demonstrated the role of facilitating discourse followed by direct instruction with the least in design and organization. However, it must also be noted that both the quantity and content of Instructor B's feedback posts influenced his overall participation by category. If his posts reinforcing the students' contributions using an encouraging phrase followed by a qualitative statement (e.g., "Great reading response: you connected the readings to your personal experience") were considered simply feedback and not a facilitating discourse post due to their lack of specificity, his total number of teaching presence posts would have been reduced by 46.55% (f = 27). Further his facilitating discourse activity would have shifted from being his primary category for overall teaching presence to his lowest. If these repetitive feedback posts were considered to be reinforcing the methods established in the design and organization category, the category he most frequently exhibited would have shifted to design and organization. Similarly, if repetitive feedback posts (i.e., the same post verbatim for each student for the week) were each counted only once, his facilitating discourse posts would have been reduced by 68.97%, making design and organization his primary category of overall class activity. However, all posts for both instructors were counted independently without regard to repetition. Therefore, facilitating discourse was the primary category of teaching presence overall for the course.

A closer look at the content reveals that the primary indicator in the facilitating discourse category for both students and instructors was encouraging or reinforcing a contribution (TP-FD-3). Although this indicator alone accounted for 31.09% of the total teaching presence in the course, this content was not likely to have been the cause of

facilitation of discourse in either group. This conclusion is supported by the fact that, although the posts of students not participating in the study were unavailable to the researcher, only one of the 25 total student posts with this indicator generated further discourse (i.e., even one response) from another study participant. Similarly, only one of Instructor A's 49 posts with a TP-FD-3 indicator prompted more discourse (i.e., a response from a student), and that response was to a specific question asked of the student (i.e., also including a TP-FD-5 indicator). Although Instructor B's feedback posts in the discussion board with the TP-FD-3 indicator (f = 23) cannot be connected to posts through threading, these were also not likely to have generated a response due to their lack of specificity.

Another type of facilitating discourse indicator that was somewhat a misnomer was that of "prompting discussion" (TP-FD-5). While the study participants generated seven posts with this as the primary indicator, only three of them (42.86%) generated a response from another study participant. Likewise, Instructor A generated three such posts (all in the discussion board), with only two responses (66.67%) by students. However, both responses were brief and specific answers to a specific question posed by the instructor (i.e., asking for a link to a resource and asking about a student experience). The lack of dialogue with the instructor may have been due to his practice of posting in the module from the previous week, when students were engaged in another topic.

This lack of response to posts coded as facilitating discourse may reflect the nature of the CoI model as a process model, and be explained by the interactive character of the presences and categories. At the level of the three presences, because 47.42% of the discussion board posts coded as TP-FD-3 occurred in the first three weeks of the course (i.e., when social presence is being established), these posts may have been considered part of the

interactive category of social presence with the indicator of "complimenting, expressing appreciation" (Rourke et al., 1999, p.61). These posts may have served the purpose of developing social presence rather than facilitating discourse. Within teaching presence, the lack of responses to facilitating discourse posts may be a reflection of the effect of the design and organization category on students' posting behaviors. The syllabus established the expectation that students would post three responses (i.e., one response to the readings plus two responses to peers) each week. Most students met only this minimum, with only two students posting an average of four or more posts per week. Students may simply have already responded to two other posts (i.e., posts without a teaching presence indicator) and, having met the minimum, moved on to another task.

There were five teaching presence indicators absent from all sources (i.e., instructor and student content) in both class sections. Two of these, establishing netiquette (TP-DE-5) and responding to technical concerns (TP-DI-7), could have been absent because this was not the first online course for these students or in the program. Therefore, students were already familiar with the pattern of netiquette in the classes and with the mechanics of technical matters. There was also a separate department at the university that could respond to technical concerns. The other absent indicators may have resulted from neither instructor exhibiting a presence in the discussion board while students were engaged in the topic. Seeking to reach consensus (TP-FD-2), assessing the efficacy of the process (TP-FD-6), and focusing the discussion on specific issues (TP-DI-2) were all activities that would be done during a discussion rather than after it was completed. Because Instructor A posted after the module was completed by the students and Instructor B posted only in the private feedback area, these types of posts may have been "too late." Further, students were likely to have

thought it the responsibility of the instructor to tell students when they were "off track" or to negotiate consensus when two or more participants disagreed. The relationship of the absence of these indicators to cognitive presence is discussed in a later section of this chapter.

Several important findings emerged regarding the design and organization category that support the conclusions of other researchers. Although studies questioning the construct of teaching presence and its conceptualization (Akyol & Garrison, 2008; Arbaugh, 2007; Arbaugh et al., 2008; Diaz, Swan, Ice, & Kupczynski, 2010) used student perception data (i.e., CoI survey responses), the content analysis data in this study reinforce the conclusion that design and organization is not like the other categories of teaching presence. This was evident in two ways. First, these data corroborate the speculation that the primary effort in the design and organization category occurs before the course begins, and once the course is underway, it decreases while the other teaching presence categories increase. In the present study this was especially evident in the data for total instructor teaching presence by week, reflecting that 48.00% of Instructor A's and 61.11% of Instructor B's design and organization messages were in Week 1 when the syllabus and the first discussion prompt were presented. If the other template materials written before the course began were included (i.e., other discussion prompts and assignment instructions), the percentage of design and organization messages written before the course began was 69.23% in Group A and 100.00% in Group B. Further, including the announcements posted by Instructor A that repeated syllabus content verbatim or added a clarifying statement to syllabus content (e.g., posting the calendar due date for an assignment when the syllabus said "Sunday of Week 5") increased Instructor A's "pre-course" posts to 88.46% of the total design and organization posts. Secondly, although

students can engage in teaching presence, this is the only category that was virtually absent from student content (i.e., only one of the 312 total student posts).

In summary, this study supported two points regarding teaching presence that have met the general consensus of the literature: 1) the instructor generally engages in higher levels of teaching presence than students, especially in the design and organization category; and 2) design and organization occurs primarily before the course begins. Consensus on the dynamics of the categories of facilitating discourse and direct instruction are not apparent in the literature and are likewise mixed in this study. First, this study found that students in both groups engaged primarily in facilitating discourse, where other researchers (Akyol, Garrison, & Ozden, 2009; Anderson et al., 2001) found them to primarily exhibit direct instruction. Secondly, Instructor A engaged primarily in direct instruction, consistent with the findings of Anderson et al., but Instructor B engaged primarily in facilitating discourse. Third, unlike most studies, the present study included content outside of the discussion board and found that Instructor B's patterns of activity changed (i.e., from primarily design and organization in the discussion board to primarily facilitating discourse), while Instructor A's activity remained the same (i.e., primarily direct instruction). Finally, this study's data on teaching presence at the indicator level revealed that the most frequent indicator in both groups was that of facilitating discourse – encouraging, acknowledging or reinforcing student contributions (TP-FD-3), while several indicators were not present at all (i.e., TP-DE-5, TP-DI-2, TP-DI-7, TP-FD-2, and TP-FD-6). The relevance of the findings at the indicator level of teaching presence is discussed in the section on the relationship between teaching and cognitive presence.

Cognitive Presence

In contrast to early studies (Garrison, Anderson, & Archer, 2001; Garrison et al., 2001; Garrison & Cleveland-Innes 2005; Kanuka & Anderson 1998; Kanuka, Rourke, & Laflamme, 2007; Meyer 2003; Rourke & Kanuka 2009) using the CoI coding schemes that found students to stall at the exploration phase, the primary phase of student posts in the discussion board in the present study in both groups was the integration phase (66.50% of posts in Group A and 68.87% in Group B). The exploration phase had the next highest frequency with 27.67% of the posts in Group A and 27.36% in Group B. Consistent with both early and more recent research (Akyol & Garrison, 2011b; Akyol, Garrison, et al., 2009; Akyol, Vaughan, & Garrison, 2011; Kanuka et al., 2007; Meyer, 2003, 2004), the least common phase in Group B was in the resolution phase (0.00%). In Group A, the triggering event phase occurred least frequently (0.49%), with the resolution phase occurring only slightly more frequently (1.46%). While Shea and Bidjerano (2009a) concluded that evidence of neither advanced stage in the learning cycle (i.e., integration and resolution) is likely to appear in the threaded discussion, this study found integration to be not only present but predominant, while the resolution phase was lacking.

There was little change over time in the frequency of the various phases, except between Modules 1 and 2. The posts in Module 1 were all in the exploration phase, moving to the integration phase in Module 2 and remaining primarily in integration for the rest of the course (except in Group A, which moved back to exploration phase for the last module). Another development over time was that the three resolution posts were found at the end of the course in Modules 7 and 8. While this supports the idea that time is required to reach the

higher stages of cognitive presence as found by Akyol et al. (2011), it is not supported by the findings of Akyol and Garrison (2008) in which a significant time by category effect was not present.

The finding that integration was the most frequent phase of cognitive presence is consistent with more recent studies using content analysis guided by the CoI coding schemes (Akyol & Garrison, 2008, 2011b; Akyol et al., 2009; Akyol et al., 2011). While the present study supported those findings, it is also consistent with studies (Garrison et al., 2001; Maddrell, 2011) finding that distinctions between the exploration and integration phases are the most difficult to detect. The high frequency indicators at both a lower level (i.e., exploration) and a higher level (i.e. integration) as possible interpretations in the most challenging types of content to evaluate in this study (Appendix M), demonstrates the challenges in observing the nuances of cognitive presence as a *process*.

Further, the heuristic of "coding up" (Garrison et al., 2001, p.17) resulted in some discussion board posts being coded as integration when only a glimpse of integration was present. Many of the posts at the integration phase still lacked deep analysis by the student, such as analyses comparing specific elements of the issue being discussed or solving a problem. Likewise, some of the projects were coded at the resolution phase with very little evidence of presenting solutions (CP-RE-1) or analyzing their effectiveness (CP-RE-2), whether in proposing possible obstacles to implementation or in articulating why they would be effective if implemented. Projects were also coded at the resolution phase if they presented a solution, but the solution was not well-thought out and defended. Because the integration and resolution phases are, according to the CoI framework, considered indicative

of higher order thinking, their content at the more specific indicator level is also presented here.

Consistent with the Practical Inquiry (PI) model's pragmatic focus that stresses the importance of the educational context being applied to real-life situations (Garrison et al., 1999), most of the posts at the integration phase (87.59% of the total integration posts in Group A and 93.15% of the total integration posts in Group B) involved students integrating their experience with the readings (CP-IN-3), with that of a peer (CP-IN-1), or both. This was also true specifically of Module 6 in which the percentage of posts in the integration phase for the module was higher than any other module in Group A and fourth highest percentage of all modules in Group B. In this module, in which 87.88% of the integration posts were CP-IN-1 and/or CP-IN-3, students were reflecting on strategies for teaching English Language Learners and used many examples from their classrooms. However, while the coding scheme calls CP-IN-3 "connecting ideas, synthesis" (Garrison et al., 2001, p. 16), most of these posts did not fit Bloom's (1956) notion of synthesis, the fourth level on his five-level taxonomy in which students combine ideas to form something new. Instead, they would have fit a lower level, such as the third level (application). The two indicators of integration (i.e., CP-IN-2 and CP-IN-4) with the lowest frequency in both groups are those that correspond to higher level cognition in Bloom's cognitive model, such as the fourth level (synthesis) or the final, fifth, level in which the students evaluate and make judgments about the material according to some criteria. In this study, while students evaluated situations in their classroom based on the course content, they did not evaluate any newly formed ideas. Further, students in this study who integrated experience with that of a peer (CP-IN-1) or with other information (CP-IN-3) generally stopped short of developing justified and defendable theories or hypotheses

for why situations existed or what might be causing the problems they were facing (CP-IN-2) or suggesting possible solutions to the problems (CP-IN-4). These indicators combined were present in only 34.31% of the integration posts in Group A and 30.13% in Group B. Although Richardson and Ice (2010) found nearly equal frequencies of CP-IN-1 + CP-IN-3 and CP-IN-2 + CP-IN-4, in an examination of a similar type of discussion (i.e., open-ended), the overall percentage of students reaching the integration phase was similar (i.e., 60% in Richardson and Ice, 66.5% and 66.87% for the groups in this study). This illustrates the care that is necessary in interpreting CoI research at the phase level of cognitive presence. While overall results may be similar, examination of the posts at the indicator level reveal that not all integration phase posts demonstrate higher levels of *critical* thinking.

The final phase (i.e., resolution) indicators, providing examples of how problems were solved (CP-RE-1) or defending why a problem was solved in a particular way (CP-RE-2), were not present in the discussion board for Group B and only present in three posts in Group A. All of these posts provided examples of how a student had solved a problem (CP-RE-1), with one also explaining why it was solved in that way (CP-RE-2). This lack of posts at the resolution phase is consistent with the preponderance of the CoI research (e.g., Akyol & Garrison, 2008, 2011b; Darabi, Arrastia, Nelson, Cornille, & Liang, 2011; Richardson & Ice, 2010).

The lack of integration posts that proposed a hypothesis or a solution, as well as the low frequency of posts at the resolution phase, supports Yang, Richardson, French, and Lehman's (2011) suggestion that "AOD's [Asynchronous Online Discussions] do not always involve problem solving or require students to respond at the highest level of critical thinking" (p. 46). Similarly, other researchers have contended that it is necessary to look

beyond the threaded discussions for evidence of resolution because the discussions are designed to only initiate the learning cycle (Shea & Bidjerano, 2009a) and because students reserve their best thoughts for the papers and assignments that are a larger portion of their grade (Archer, 2010). For this reason, this study examined students' final projects for evidence of cognitive presence and found results that did not support those conclusions, but suggest that where a student displays her highest level of critical thinking may vary according to the individual. While three students reached the resolution phase (with only one post each) in the discussion board and four reached the resolution phase in their projects, no student reached resolution in both. Further, most students reaching the resolution phase in their projects were in the lower half of their group rankings for percentage of posts in the discussion board that reached the integration or resolution phases. One possible explanation for this is that students may demonstrate their best thoughts in the type of activity they perceive to be most helpful. The student open-ended survey responses would support this conjecture, as five of the ten students who responded to the survey pointed to the discussion board as the element of the course that was most helpful in "integrat[ing] new information with prior learning" (i.e., integration phase) or "creat[ing] and test[ing] solutions to related problems," while four of the remaining students pointed to the course project. While these responses could not be connected to individual students' performance data due to confidentiality issues, this raises the possibility that the part of the course where students achieved their highest levels of thinking may have been a reflection of their personal preference for type of learning activity.

In summary, this study found that most students reached the integration phase, both in the discussion board and in the class project. Further, students who reached the resolution

phase did so in either the class discussions or the class project, but not both. Students reached the integration phase quickly (i.e., in Module 2) but took longer to reach the resolution phase (i.e., Week 6 for the project and Modules 7 and 8 in the discussion board). However, not all of the content in these "higher" phases demonstrated problem solving or creation of new ideas and hypotheses. Data at the indicator level was more illustrative of the levels of critical thinking than data at the phase level.

Relationships Between Teaching and Cognitive Presence

This section will describe relationships between student teaching presence and higher levels of cognitive presence in the discussion board as well as the relationship between instructor teaching presence in the discussion board and student cognitive presence. It will also describe instructor teaching presence exhibited outside the discussion board and its relationship to student cognitive presence both in the discussion board and in a course project.

Student Teaching and Cognitive Presence in the Discussion Board

Although there was little overall student teaching presence (19.42% of total posts in Group A and 8.49% in Group B), almost all of the student posts with teaching presence (87.50% in Group A and 100.00% in Group B) also exhibited cognitive presence. An examination of the frequency of these posts for individual students suggests a possible inverse relationship between the percentage of an individual student's teaching presence posts and the percentage of her posts at the integration and resolution phases of cognitive presence. In both groups the student with the highest percentage of total posts that included a teaching presence indicator (Student 8 in Group A, 35.71%; Student 1 in Group B, 20.00%) was in the lower

half of her group in percentage of posts at the integration and resolution phases (Student 8 in Group A, 60.71%, ranked seventh of eight; Student 1 in Group B, 60.00%, ranked third of four students). An even greater contrast was found in the students with the highest percentage of integration and resolution posts in each group (Student 3, 82.61% in Group A; Student 4, 86.36% in Group B) having the lowest levels of teaching presence (4.35%, ranking eighth of eight; and 0.00%, ranking fourth of four, respectively). However, caution is warranted in making generalizations about a potential relationship for several reasons. First, there was not a statistically significant correlation between individual student levels of teaching presence and the percentage of posts at either the integration or resolution phase (r = -.51, p = .087). Secondly, the small sample size made it relatively easy for a student to move several ranks in their group, especially in Group B with only four participants (e.g., if Student 4 would have had only two posts with a TP indicator, she would have ranked second of the four instead of last). Third, the caution suggested by Shea, Hayes et al. (2010) against using "quantity rather than quality as criteria for evaluating cognitive presence" (p. 15) applies here to teaching presence because the evidence of teaching presence is influenced by the high prevalence of TP-FD-3 indicators (i.e., acknowledging or reinforcing phrases, like "good job" or "thanks for sharing…"; 51.02% of teaching presence posts). A student who is encouraging by nature could have a much higher level of teaching presence than one who shared information related to course content or who asked questions to prompt further discussion. Nevertheless, the potential inverse relationship between teaching and cognitive presences for some individual students is an important consideration for educators. Is it possible that teaching presence and cognitive presence cannot go hand-in-hand, and that if a student exhibits high levels of teaching presence she will not reach the integration and resolution phases? Conversely, if a

student is highly engaged in reflection and constructing meaning can the student also be engaged in teaching presence? The answers to these questions would influence both the design of the discussion board, especially the content of the prompts, as well as the instructors' involvement. If, as Shea, Hayes et al. suggest, students have a "floor threshold" (p. 14) and exhibit higher teaching presence when the instructor teaching presence drops to zero and if, as the present study suggests, higher student teaching presence may be related to students remaining at lower levels of cognitive presence, instructors must be cautioned to maintain strong levels of teaching presence throughout the course. A more specific examination of the relationship between the two presences, at the category/phase level, sheds further light on what characteristics this instructor teaching presence may need.

Based on the overall category/phase frequency data for teaching and cognitive presences, the combination of category and phase in the posts that exhibited both presences followed the frequency pattern one would expect in both groups. As discussed previously and reviewed in Table 23, the overall teaching presence in both groups was primarily in the facilitating discourse category, followed by direct instruction. The most prevalent overall cognitive presence phases were integration followed by exploration. Consequently, the highest frequency combination for posts exhibiting both presences (f = 20, 9.71% of total posts for Group A; f = 3, 2.83% of total posts for Group B) was facilitating discourse (i.e., the highest frequency teaching presence category) with the integration phase (i.e., the highest frequency cognitive presence phase). This was followed by facilitating discourse with the exploration phase (i.e., highest frequency teaching presence category + second highest frequency cognitive presence phase). The pattern then continued with the second highest frequency teaching presence category (i.e., direct instruction) accompanied by the cognitive

Table 23. Percentage of Posts in Teaching Presence, Cognitive Presence, and Combined Presence Categories by Phase and Group

			Cognitive Presence Phase			
	Teaching presence category		Integration	Exploration	Resolution	Triggering event
		All posts[1]	66.50	27.67	1.46	0.49
Group A	Facilitating discourse	16.99	9.71	5.34	0.49	
	Direct instruction	1.94	0.97	0.49		
	Design and organization	0.49				
		All posts[1]	68.87	27.36	0.94	0.00
Group B	Facilitating Discourse	5.66	2.83	2.83		
	Direct Instruction	2.83	1.89	0.94		
	Design and organization	0.00				

Note. The first column represents the percentage of the group's total posts (f = 206 in Group A and f = 106 in Group B) exhibiting that category of teaching presence. The first row represents the percentage of the group's total posts exhibiting that phase of cognitive presence. The percentages in the shaded area are the percentage of the group's total posts that contained indicators of both the teaching presence category and the cognitive presence phase corresponding to that cell.

presence phases in order of frequency (i.e., integration followed by exploration) and one post in the lowest frequency teaching presence category (i.e., design and organization) + the highest frequency cognitive presence phase (i.e., integration).

The observed pattern of the composition of posts exhibiting both presences suggests that the frequency of a particular type of combined post (e.g., a post at the integration phase that also has a facilitating discourse indicator) may simply be indicative of the overall frequencies for categories and phases. For example, because posts at the integration phase were observed more than twice as frequently as exploration posts, one would expect that posts containing both presences would have a high prevalence of integration phase indicators. The observed relationships cannot be generalized beyond this study due to the small sample size, especially in Group B with only nine posts demonstrating teaching presence. Further, this reporting of individual posts as a combination of teaching presence categories and cognitive presence phases is unique to the literature. Therefore these data cannot be compared directly with other research. While some studies have examined two or three of the presences using the same data set (i.e., discussion board posts from the same class sections), they have not indicated frequencies of posts with combinations of presences or which combinations of categories and/or phases were evident together in the same post. In some cases (Akyol & Garrison, 2008; Akyol et al., 2011), the frequency counts of categories or phases for each presence are reported separately with each including a "no category detected" (e.g., Akyol & Garrison, p. 7) frequency count, meaning that particular category or phase was not detected. In the same manner, others reported only frequency percentages in separate tables (Akyol, Garrison et al., 2009) or only total frequency counts by presence, not delineating the makeup by category or

phase (Shea, et al., 2010). For comparison of results, further studies reporting the specific composition of individual posts with multiple presences is needed.

While the coders in this study would agree with the supposition that coding at the indicator level is difficult (Garrison & Arbaugh, 2007), the data demonstrates the value of examining posts at this level. The specificity of data at the indicator level appeared to provide the most useful information for instructional designers, curriculum developers, and instructors in relationship to cognitive presence. Three indicators and relationships were especially noteworthy.

First, the most prominent overall teaching presence indicator in both groups was that of acknowledging or reinforcing contributions (TP-FD-3). As one might expect, this was also the most frequent teaching presence indicator in those posts exhibiting both teaching and cognitive presence. Further, it accompanied cognitive presence indicators at both the exploration and integration phases. Due to the general nature of phrases marking this indicator (e.g., “Thank you for sharing”, “What an interesting story”, or “Great job!”), no clear pattern of relationship between it and cognitive presence indicators was evident. In Group A, it was primarily associated with the most prevalent overall cognitive presence phase, integration phase posts (CP-IN-1, $f = 6$; CP-IN-3, $f = 5$; CP-IN-2, $f = 3$), followed by the second most prevalent, the exploration phase (CP-EX-3, $f = 4$; CP-EX-5, $f = 1$) and one resolution phase indicator (CP-RE-1). But in Group B, it was primarily paired with a cognitive presence indicator (CP-EX-2) that was one-fourth as frequent as the predominant overall indicator (CP-IN-3) for the group, followed by pairing with an indicator (CP-EX-6) one-third the frequency of the predominant cognitive presence indicator. Again, the small sample size and low frequency of posts containing both teaching and cognitive presence ($f =$

9) counts must be noted. With the cognitive and teaching presence indicator combinations ranging from only one to three in Group B, these diverging patterns are, again, inconsequential. In fact, the lack of consistent pattern both with the overall data and between groups seems to reinforce the speculation that the TP-FD-3 indicator is general enough to accompany any phase of cognitive presence and may not have a direct relationship or impact on any particular phase.

Secondly, while it appears that the facilitating discourse indicator of setting the climate for learning (TP-FD-4) almost always accompanied posts exchanging personal information (CP-EX-3, 85.71% of the posts with both TP-FD-4 and a cognitive presence indicator), it must be noted that this teaching presence indicator appeared only in Modules 1 and 2 when students were getting to know one another by sharing personal background and experiences (CP-EX-3) and expressing their expectations for the course (TP-FD-4). The nature of this teaching presence indicator suggests that, when used by students, it is likely to appear early in the course and could therefore be expected to accompany exploration phase posts as students are exploring the material and engaging in initial course interactions.

A third combination of teaching and cognitive presence indicators that emerged was the facilitating discourse indicator of drawing in participants or prompting discussion (TP-FD-5), which surfaced only in posts at the integration phase. While these posts ranged from a post aimed at making sense of the theory described in the week's readings to posts seeking practical resources for the classroom, exploration of the course content in the weeks in which they appear hints that the design and organization of a course may influence their presence. Four of the seven posts with this indicator appeared during Module 7 when two components of the course design may have contributed to the search for input from classmates. First, the

focus in the readings for the week was very practical, as it addressed strategies for intervention with ELL students. This prompted the students to share experiences they had or problems they had encountered that were similar to the readings (CP-IN-3) or to that of a peer (CP-IN-1). Secondly, three of these posts actually appeared in Week 6, when at the beginning of the week, students had submitted a critique of their district's programs. In this critique, students were tasked with not only evaluating the programs but making suggestions for what they would change as well. This seemed to carry over to the discussion board as students evaluated the strategies proposed in the readings in light of their experience (CP-IN-3, $f = 3$ of the four posts with TP-FD-5 in Module 7). Both instructors felt that such opportunities to use course content in their work had a positive impact on students' ability to apply the content to other situations. As Instructor A pointed out, "What they are reading and thinking about has a direct relationship to what they're doing every day, and so part of what they do in the course is to consider the implications of what they're learning for what they're doing." While this kind of integration may be influenced by the type of course content (Arbaugh, Bangert, & Cleveland-Innes, 2010), it is nevertheless an important consideration in course and curriculum design.

In light of the discussion on the divergent levels of cognition within the integration phase and the apparent lack of evidence for students developing new hypotheses (CP-IN-2) or creating solutions to problems (CP-IN-4), it is interesting to note that, of the posts displaying these cognitive presence indicators along with teaching presence ($f = 7$ in Group A and $f = 2$ in Group B), 57.14% in Group A were accompanied by the TP-FD-5 indicator. Looking more specifically at the CP-IN-2 indicator (i.e., developing a new hypothesis), in the overall discussion board 8.82% of the posts with this indicator in Group A were accompanied by the

TP-FD-5 indicator. However, due to the low frequency of CP-IN-2 posts, this percentage represented only three posts and the combination was absent in Group B, therefore prohibiting any reliable conclusions about a relationship between the two factors. Nevertheless, if students who are asking questions of their peers are also engaging in the cognitive processes of generating hypotheses or creating solutions, the link would be of pedagogical consequence. Course designers and instructors could embed a directive in the discussion board prompts and/or rubrics that encourages students to ask questions of peers or to seek resources for problem solving. The potential of a relationship between the TP-FD-5 teaching presence indicator and these higher levels of cognition is, therefore, worthy of further study.

In summary, two seemingly contradictory patterns of relationships emerged in this data. First, in examining individual student engagement, it appeared that students who are more actively engaged in high phases of cognitive presence are less involved in teaching presence. Similarly, those students who had high levels of teaching presence had lower frequencies of posts demonstrating the higher phases of cognitive presence. However, in examining the individual posts that demonstrated both presences at the category/phase level, the data seemed to merely reflect the overall frequency data in each presence (e.g. integration phase posts were predominantly more frequent in both groups, so posts that also exhibited teaching presence were most often in this phase). An examination of the data at the indicator level offered a possible explanation for this discrepancy. The high frequency of certain teaching presence indicators (i.e., TP-FD-3 and TP-FD-4) impacted the overall prevalence of teaching presence at both the group and individual level. While these posts were often simple phrases of a more relational or reactionary nature (e.g., “I found your personal story interesting”), they were quantified with the same value (i.e., $f = 1$) as a post asking, “Looking

at all those approaches on literacy – which approach are you? What do you aspire to? What have you practiced?" (TP-FD-5). If the TP-FD-3 indicators were excluded due to their general and social nature, only 40.00% of the teaching presence posts in Group A and 44.44% of the teaching presence posts in Group B would also exhibit cognitive presence indicators. For some students, this would cause a notable shift in the contrast between their percentage of posts with teaching presence and the percentage of posts with cognitive presence. Only one teaching presence indicator, TP-FD-5 (i.e., drawing in participants, prompting discussion), was found exclusively in posts exhibiting a higher level phase of cognitive presence (i.e., integration). Further study is required to examine these relationships. Nevertheless, this examination of posts exhibiting both teaching and cognitive presence demonstrates the value in reporting of data at the indicator level, especially for pedagogical implications.

Instructor Teaching Presence and Student Cognitive Presence

As previously discussed, the two instructors interacted with students in different ways and through different course management tools. Similar to Shea, Vickers and Hayes's (2010) discovery, much of this interaction occurred outside the discussion board. In this section, the relationship between instructor teaching presence and student cognitive presence in the discussion board are discussed, followed by instructor teaching presence and student cognitive presence from all data sources.

Relationships in the discussion board. The discussion board data revealed two important insights for course designers and for instructors that resonate with Garrison and Cleveland-Innes' (2005) conclusion that "teaching presence contributes to the adoption of a deep approach to learning and interaction by itself does not promote a deep approach to

learning" (p. 140). This was apparent in two areas: the course design and the instructor presence after the course started.

The influence of course design on students using "a deep approach to learning" (Garrison & Cleveland-Innes, 2005, p. 140) was first apparent in the discussion prompts. As others (Meyer, 2004; Park, 2009; Pisutova-Gerber & Malovicova, 2009) have suggested, this study provided evidence that the writing prompt or question posed in the discussion forum influences the level of cognition in the student response. Because there were only two different prompts, this influence was primarily evident in the cognitive presence levels for Modules 1 and 2. In Module 1, the prompt asked students to "reflect" on their language development and people or experiences that influenced it and to "share" their goals. This was couched in the purpose of getting to know one another and looking back on their development. These types of phrases led students to share information, with 100.00% of the responses at the exploration phase in both groups. The second prompt, for Modules 2-8, provided a general direction (i.e., not connected to any particular course content) establishing clear expectations that students were to exhibit "critical, personal engagement with the issues" in the readings. It further prompted students to integrate ideas as they were directed to reflect upon where their experiences "intersect" with the content in the readings. The syllabus reinforced this expectation, as it offered suggestions for types of responses (e.g., "engage" with peers whether "agreeing with or challenging them", "resonating" with a peer's response, or "offer and support an opinion"). This was also reflected in the rubric for the discussion board where one category of evaluation was "evidence of critical thinking," with a demonstration of "application, analysis, synthesis and evaluation; well supported arguments and originality" as one of the evaluation criterion. As seen in the cognitive presence data, the

majority of the posts were at the integration phase in each of Modules 2-8 (except in Group A where the majority of students were in the exploration phase in Module 8). This was more likely to be influenced by the prompt than the development of the course (i.e., time elapsed) or establishment of relationships because some of these integration posts occurred during the first calendar week when several students responded to the Module 2 prompt. Further, by Week 2 both groups already had the majority of their posts in the integration phase.

For instructors, the second insight drawn from the data is perhaps more informative. The examination of instructor activity in the discussion board in relationship to student cognitive presence seems to echo the title of Garrison and Cleveland-Innes's (2005) article, "Facilitating cognitive presence in online learning: Interaction is not enough." This is very evident in comparing the level and type of involvement in the discussion board for the two instructors as well as the cognitive presence levels in the two groups. While Instructor A had 16 times the number of posts as Instructor B (f = 144 and 9, respectively), levels of student posts in the integration or resolution phase were almost identical in the two groups (67.96% in Group A and 68.87% in Group B). If considering only the two integration phase indicators that marked problem solving and hypothesis building skills, CP-IN-2 and CP-IN-4 (as discussed above) along with the resolution phase indicators, the levels were still very similar (24.27% in Group A and 20.75% in Group B). When including material outside the discussion board (e.g., student projects) as suggested by Shea, Vickers et al. (2010), the percentage of students reaching the resolution phase at *any* time in the course was still nearly equivalent (62.50% in Group A and 50.00% in Group B) and, due to the small sample size, only one fewer student reaching the resolution phase in Group A would have made them equal (i.e., 50.00% in each group). Each of these analyses of the data supports the idea that

the *quantity* of instructor posts is not the most important factor in guiding students to higher levels of cognition. A high level of interaction does not, in and of itself, facilitate higher order cognition (Abrami, Bernard, Bures, Borokhovski, & Tamim, 2011; Gunawardena, Lowe, & Anderson, 1997; Maddrell, 2011). As Garrison and Cleveland-Innes suggest, "Interaction directed to cognitive outcomes is characterized more by the qualitative nature of the interaction and less by quantitative measures" (p. 135).

Because the group with a very active instructor and the group with an instructor who was virtually absent from the discussion board had remarkably similar percentages of high level cognitive presence, the *quality* of the instructor posts was examined. In doing so, attention was directed to the timing, location and composition of the instructor posts. First, the timing of Instructor A's participation (i.e., participating in the module's discussions at the beginning of the week corresponding to the next module) is one factor in the seeming equalization of instructor impact on cognitive presence. While data on the number of student views for the posts were not available, only two responses were generated by Instructor A's 144 posts. Further, none of the study participants returned to a previous week's discussion to respond to peers or add further insights. This, along with similar margins of higher phases of cognitive presence in the two groups, leads to the conclusion that, in this study, instructor teaching presence (even at a high frequency) provided after the discussion had ended was inconsequential. Similarly, Instructor B's posts that were provided only to individual students and not visible in the public forum may have been ineffective. It is also possible that the timing and location factors had equal effects on student cognitive presence. The data set was too small to make broad generalizations, but it did support a foundational premise of the

framework: that "*active* teaching presence" (Garrison et al., 2001, p. 10, emphasis added) is required to "ensure continuing cognitive development" (p. 10).

The third factor, the composition of the posts, may have had a comparable influence. This is evident in the general nature of some of the interaction for both instructors. For example, when Instructor A's posts addressed multiple students in one post it often resulted in the content on any particular student's idea being limited to one or two sentences, usually a reaction or an opinion-type statement (e.g., "I agree with…" or "I'm sorry to hear…"). Further, although an examination of social presence was beyond the purview of this study, these short comments were often a part of establishing social presence, such as empathizing with students or encouraging them in their roles as parent or teacher. Similarly, while Instructor B was only addressing one student, his posts were also very general and, after Module 2, identical for each student.

Perhaps a more important consideration in the composition of the instructor posts was the observed lack of modeling higher level cognitive tasks as well as the absence of questions to move students through the phases of cognitive presence. While Instructor A often modeled higher level cognitive tasks such as supporting his agreement with a student or integrating information, only a few posts contained examples of problem solving or presenting a hypothesis. While he also prompted discussion (TP-FD-5) by asking questions, most of these were merely rhetorical questions, asking for specific information (e.g., a web link to a resource a student mentioned) or yes/no questions. Instructor B displayed none of these indicators in the discussion board. At the same time, the student posts that reflected higher level cognitive skills, such as creating a hypothesis (CP-IN-2), creating a solution (CP-IN-4), testing a solution (CP-RE-1) or defending a solution (CP-RE-2), made up less than one-fourth

of the posts in each group (24.27% in Group A, 20.75% in Group B). It would appear that the students did not experience the "cognitive conflicts" (Anderson et al., 2001, p. 7) resulting from encountering ideas contrary to their own that are necessary for higher levels of cognition. This is also seen in the absence of teaching presence posts (by both the instructors and students) that guided students through these conflicts. These indicators that were either absent or infrequent include: 1) identifying areas of agreement or disagreement (TP-FD-1, f = 3 in Group A; f = 1 in Group B); 2) seeking to reach consensus (TP-FD-2, f = 0 in both groups); 3) guiding the discussion to stay focused on the task (TP-FD-6 f = 0 in both groups); and 4) focusing the discussion on particular issues (TP-DI-2, f = 0 in both groups). Although one could argue that the lack of conflicting ideas and lack of disagreement evident in the student posts resulted in no demand for use of these indicators, they are also roles that would be assumed during a discussion, rather than after it was completed. Further, they would be present in the public forum, rather than in posts to individual students as with Instructor B.

If students need guidance to move to advanced phases of cognitive presence (Garrison et al., 2001), to what can the levels of integration that were achieved be attributed? One possible suggestion is that the teaching presence category of design and organization present in the course template materials (i.e., course syllabus, assignment instructions, and discussion prompts that were identical in both class sections), offered sufficient guidance to lead to integration. These materials accounted for only 14.20% of Instructor A's class participation and 43.10% of Instructor B's. Of the total message or thematic units in these materials, 72.00% were in the design and organization category. As described previously, the directions for the discussion board participation included several qualitative phrases that could elicit thinking at the integration phase (e.g., "offer and support an opinion," share "well supported

arguments," and express "resonances" with a peer's thoughts). While there is no evidence of a causal relationship between these types of prompts and the integration achieved, they are one of the constants between the two groups. However, a factor that may equally contribute to students reaching integration is the demographic fact that all were graduate students that one would expect to reach the types of integration most prevalent in the class sections (i.e., linking course readings or a peer's discussion to an experience or other resources, CP-IN-1 and CP-IN-3).

Nonetheless, only three posts (0.96% of all posts) reached the resolution phase and, as noted previously, the integration posts that developed hypotheses or created solutions to problems were the least frequent indicators in the integration phase. Although a growing body of research emphasizes the efficacy of various course designs or discussion strategies for facilitating higher order learning (Darabi et al., 2011; Dringus, Snyder, & Terrell, 2010; Kanuka, 2005; Kanuka et al., 2007; Richardson & Ice, 2010; Rourke & Kanuka, 2009; Rovai, 2007), these data suggest that the design in this course could only lead students to a certain level and, in the discussion board, generally did not lead to problem solving and evaluation skills. While one student felt that the generality of the prompts (i.e., for Modules 2 through 8) in the course design allowed students to make connections "with the content based on our on [*sic*] classrooms and instruction," another student felt that the lack of a specific question hindered her learning. She suggested that students should be required to ask a question "about the text and what we are learning or… about how it is playing out in the classroom" each week.

As Garrison and Cleveland-Innes (2005) suggest, it is important for instructors to provide clear expectations for content, length, and timeliness of participation. But the

instructor must also "provide engaging questions, focus discussion, challenge and test ideas, model appropriate contributions, and ensure that the discourse is progressive" (p. 145). The discussion board data in this study suggests that, just as interaction is not enough, design and organization is not enough. Both a strong course design and productive facilitation (not just interaction), both while the students are engaged and in the public forum, are necessary to move forward.

Relationships in content outside of the discussion board. Some would argue that the level of integration achieved in this study is all that should be expected in the discussion board due to the short length of discussions or because students' "resolution thoughts" (Akyol & Garrison, 2008, p. 16) are being reserved for the course project which may be a larger portion of the grade (Akyol & Garrison, 2011b; Richardson & Ice, 2010; Shea, Vickers et al., 2010). Therefore, this study also examined student projects in relationship to teaching presence, particularly the design and organization category. Both the assignment instructions and the grading rubrics guided students to various levels of cognitive presence, including problem solving and the resolution phase. The writing prompts were aimed, albeit unknowingly by the course designer, at each phase of cognitive presence. As Garrison et al. (2001) found, the instructor often articulates challenges that become the triggering event. In this case, the course template presented students with the problem of critiquing their school district's programs, methods and materials for English Language Learners (i.e., the triggering event). The rest of the writing prompt addressed the other phases, as seen in Table 24. It should be noted, however, that the prompt that could lead to resolution did not direct students to discuss *why* or *how* they would make the changes they suggested, therefore leading them to remain at the integration level of creating a solution (CP-IN-4).

Table 24

Project Assignment Instructions Prompting Cognitive Presence Phases

Cognitive Presence Phase	Corresponding Assignment Instruction
Triggering Event (presented by instructor)	Critique: district's programs, methods and materials for English Language Learners
Exploration	Describe: demographics, policies, resources (CP-EX-3)
Integration	Evaluate: policies, programs, student outcomes in light of course materials and discussions (CP-IN-3)
	Analyze: congruence of policies and personal philosophy (CP-IN-3)
Integration and/or Resolution	Create: what would you change? (CP-IN-4) or if ways to overcome obstacles is presented (CP-RE-1) or if supported with rationale (CP-RE-2)

Note. Corresponding assignment instruction = Quote from the assignment description in the syllabus and how it was coded.

The student cognitive presence data for the projects offered interesting results. While three students in Group A reached the resolution phase in the discussion board, they did not reach resolution in the projects with specific directives instead of a general writing prompt. In contrast, four students who did not reach resolution in the discussion board reached it in their projects. One possible reason for this may be student learning styles and/or preferences for interaction. Garrison et al. (2001) describe the process of moving from one phase to another as "iteratively moving between the private and shared worlds – that is, between critical reflection and discourse" (p. 10). Some students may benefit more from the "critical reflection" (p. 10) that was especially inherent in the individual project, while others may have excelled with the discourse that is characteristic of the discussion board.

In summary, students in both groups attained similar levels of high level cognitive presence, although there were marked differences in instructor presence. Instructor A had a

very high frequency of participation in the discussion board while Instructor B participated primarily through individual student feedback. Instructor A offered specific posts in response to student content with direct instruction as the highest frequency category of teaching presence. In contrast, Instructor B's posts were primarily in the facilitating discourse category. These posts offered general reinforcement and were often identical for all students in the class section. The similarities in levels of student cognitive presence may be a result of the design and organization of the course, the teaching presence factor that was similar for both class sections. However, most students did not demonstrate cognitive skills such as problem solving or construction of new ideas. In these two groups either something was absent that was necessary to move the students to the final phase (e.g., cognitive conflict, time, challenging questions) or something was present that prohibited them from moving forward.

Community of Inquiry Survey

The final question in this study examined the relationship between student-reported cognitive presence as measured by the Community of Inquiry survey and the content analysis data. While a student-to-student comparison could not be conducted due to the need for providing anonymity in the survey, an analysis of group data was completed and frequency data were reported. Two interesting patterns emerged from an examination of the 10 valid responses.

First, as seen in Table 25, both groups had a mean of 3.50 or above (i.e., *agree* or *strongly agree*) for the items corresponding to each of the phases of cognitive presence. However, when examining responses at the individual level, students were more likely to

agree or *strongly agree* with the items at the higher phases of cognitive presence (i.e., integration and resolution) than the lower phase items (i.e., triggering event and exploration). Overall, there were 2.50 times more *neutral* or *disagree* responses (f = 15, 25.00% of possible responses) for items in the triggering event and exploration phases than in the integration and resolution phases (f = 6, 10.00% of possible responses). Further, only two of the ten respondents had mean scores for the combined integration and resolution phase items that were higher than the mean score for the combined triggering event and exploration phase items. These results are curious because the higher level phases "borrow characteristics" (Garrison, Anderson & Archer, 2001, p. 17) from the lower phases. Therefore, a student who perceived that she engaged in the higher levels should also have engaged in the lower level phases upon which they are built.

Table 25

Mean Scores on the Community of Inquiry Survey – Perceptions of Cognitive Presence

	Low Levels			High Levels			
Group	Triggering Event	Exploration	Low Levels Combined	Integration	Resolution	High Levels Combined	All Levels Combined
A	3.83	3.94	3.89	4.28	4.22	4.25	4.07
B	4.25	4.08	4.17	4.33	4.42	4.38	4.27

Note. Scores range from 1 (*strongly agree*) to 5 (*strongly disagree*). Triggering event scores are the mean of items 23-25; Exploration scores are the mean of items 26-28; Integration scores are the mean of items 29-31; Resolution scores are the mean of items 32-34. See Appendix G for the complete survey.

Secondly, only two students (of the 10 completing the survey) gave one or more *neutral* responses on the resolution phase items of the survey. The other eight students (80.00% of respondents) either *agreed* or *strongly agreed* that they could do the three survey items corresponding to the resolution phase. However, only 58.33% (f = 7) of the students actually reached the resolution phase in either the discussion board or in their final projects. As noted, due to the manner of survey distribution, individual comparisons cannot be made. One possible explanation for these discrepancies is that the items corresponding to the triggering event phase, along with one of the exploration phase items (i.e., items 23-26) are the cognitive presence survey items most clearly directed at the processes engaged in during the course (e.g., "problems increased my interest…" or "the course activities piqued my curiosity"). These statements evaluating things *outside* of the student (e.g., course activities), the students' reaction to them (e.g., "I felt motivated…") or the students' use of them (e.g., "I utilized a variety of information") had the highest number of students (f = 5) who were either *neutral* or *disagreed* on one or more items. In contrast, the resolution phase items (i.e., items 32-34) were those most clearly reflecting course outcomes and student competencies (e.g., "I have developed…" or "I can apply"). These items evaluating the *student herself* had the lowest number (f = 2) of students responding with either *neutral* or *disagree*. It is possible that the lower level items reflected student perceptions of the course itself and the higher level items more closely reflect the students' self-efficacy. Therefore, the higher resolution scores could simply indicate that students were more willing to negatively evaluate the course than to negatively evaluate themselves (Guri-Rosenblit & Gros, 2011; Lee, Carter-Wells, Glaeser, Ivers, & Street, 2006).

Limitations

Four limitations to this study are worth noting. First, while both the primary investigator and the second coder had extensively researched the literature on the Community of Inquiry framework and both were familiar with the coding schemes, neither was trained in using these tools for data analysis. While this increased concerns about whether the interpretations and application of the schemes were consistent with other researchers, the coders extensively reviewed the literature to gain an understanding of how the schemes are generally used. Addressing this limitation also led to useful information about the utility of the schemes for researchers who have limited resources for hiring a trainer to assist them.

Secondly, although the small sample size allowed for manageability of the study and a more thorough examination of the data, it nevertheless limited generalizations about the findings beyond the sample in this study. The purposeful criterion based sampling procedure and the subsequent convenience sampling of cases limited the study to an online, graduate-level course with two class sections, taught from a course template that had already been used at least once. Further, the course was specific to one discipline (i.e., education) and highly discussion based. Within each case the sample was also limited by the number of students who agreed to participate, especially in Group B with only 28.57% of the students participating. While both groups received the same number and type of invitations for participation from the researcher, only Instructor A posted the invitation in the announcements for the course. This difference may have contributed to the difference in participation between the groups. Reliance on students to volunteer also introduced the possibility of self-selection bias, limiting the sample to female students who had at least some

experience in the online learning environment (i.e., at least two prior courses).

The low student response rate also contributed to the third limitation, not having access to all data from the class sections. Challenges in acquiring institutional approval as well as confidentiality issues led to the researcher not having access to the discussion posts of all the students. This made it impossible to follow the complete threads in the discussion board and to fully see the types of responses generated by posts with various indicators. The lack of access to instructor-student emails, especially for Instructor B, limited the examination of instructor teaching presence occurring outside of the public forum.

Finally, potential issues of bias were present in the study in both the coding process and the survey. While identifying information was removed from data before it was seen by the second coder, the primary investigator had the names of both the instructors and the participants through the consent process. Although she had only a minimal acquaintance with one of the instructors, coding could have been affected by perceptions of a particular teacher's reputation or abilities. Similarly, because both coders were familiar with the institution and its faculty, it is possible that the instructors' identities could have been deduced by the second coder due to course content. In addition, while steps were taken to assure students of anonymity in their end-of-course evaluations, it is possible that students were reluctant to share honest evaluations of the instructor and the course due to the researcher's shared faculty status and assumed connections with the instructors.

Contributions to the Literature

Despite these limitations, this research offers several important contributions to the literature. Perhaps most importantly, the study engaged three research design components

worthy of replication. First, while the study utilized existing coding schemes (Anderson et al., 2001; Garrison et al., 2001) and replicated the process used by others (Akyol & Garrison, 2011b; Richardson & Ice, 2010) to achieve acceptable levels of inter-rater reliability, it also addressed areas of ambiguity in the coding schemes by offering a useful protocol for distinguishing between presences, categories/phases, and indicators. Secondly, in contrast to most CoI research, the study provided a holistic picture of the dynamics of online class interactions by examining not only the discussion board interactions of both students and the instructors, but the teaching and learning process outside the discussion board as well. Course artifacts (i.e., a student project, course syllabus, announcements, assignment instructions, and grading feedback) were analyzed to provide a more complete understanding of both teaching and cognitive presence. Finally, the study extended the CoI research by providing an example of content analysis at the indicator level. While this level of specificity comes with inherent challenges of reliability, this study demonstrated that differentiating the *quality* of content within categories and phases holds the potential for generating useful pedagogical conclusions.

Suggestions for Future Research

This research raises several suggestions for future research. First, the reliability of the coding schemes would be enhanced by developing a protocol for their application and use. This could be informed by a meta-analysis of the literature tracing their development, the characteristics of content causing low inter-rater agreement in coding, modifications made to the schemes, and the criteria researchers have used to delineate evidence of presences, categories and phases that are, by definition, interdependent. Secondly, the integration phase

of cognitive presence particularly warrants further study. Does it represent too wide a range of cognitive processes? Should the generation of new knowledge (i.e., developing hypotheses and creating solutions to problems) be viewed distinctly from integrating materials or ideas? Particularly when Garrison et al.'s (2001) heuristic of "cod[ing] up" (p.17) is employed does the integration phase mean that students are engaging in *higher* order thinking? Would more indicators assist in capturing the essence of the phase(s)? Studies triangulating the data by coding the same content with multiple frameworks such as the CoI framework, Bloom's taxonomy (1956) or Henri's cognitive framework (1992) may be particularly helpful in examining the conceptualization of the integration phase. Third, in spite of the challenges of coding at the indicator level, further examinations of the relationships between teaching presence indicators and evidence of students developing hypotheses or creating, supporting and evaluating solutions to problems may be the most helpful research for moving the framework from a tool for "understanding and explaining the complexities of online conferencing and educational discourse" (Garrison, Cleveland-Innes, Koole, & Kappelman, 2006, p. 4) to one that guides educators in "the optimal use of computer conferencing as a medium to facilitate an educational transaction" (Garrison et al., 1999, p. 87). Do high levels of a particular indicator (e.g., asking questions) prompt higher order thinking? Effects of other factors, such as the timing of instructor posts would also be instructive. Finally, just as Garrison and Arbaugh (2007) suggest that increasing student metacognitive awareness might enhance student cognitive presence, research into the impact of instructor awareness of the teaching presence indicators would be useful from a practical pedagogical perspective. While research has not yet clearly linked specific teaching presence indicators to students'

emonstration of cognitive activities such as problem solving and hypothesis building, would faculty training and awareness of them influence such achievement?

Summary

This case study provided a holistic view of the dynamics of two class sections of a graduate-level online course through the lens of the Community of Inquiry framework. The examination of teaching presence in both teacher and student discussion board posts found that one instructor had a much higher frequency of teaching presence than either his students or the other instructor, and the other instructor had an equal number of posts to his students. The student cognitive presence in the two groups, however, was similar between groups, with most of the posts in the integration phase. With identical pre-course design and organization elements for both groups, the overall teaching presence data led to the conclusion that a qualitative factor (i.e., the timing of instructor participation, the composition of the posts, or both) may have influenced the effectiveness of the participation of the more active instructor in leading students to higher levels of cognition. Instructors, faculty development leaders and administrators should therefore balance the importance of frequent communication with the need for purposeful interaction.

Individual student posts were evaluated for coexistence of teaching and cognitive presence within the post. While at the category/phase level no conclusive patterns were observed, at the indicator level the student teaching presence indicator of prompting discussion almost always appeared with integration phase content. Although the small sample size and resulting low frequency of posts with both teaching and cognitive presence prohibit

conclusions of causality, the data raises the suggestion that encouraging students to ask questions of their peers might also be prompting them to be engaged in integration of ideas.

The study also revealed insights into the use and interpretation of the cognitive and teaching presence coding schemes. The approach to data analysis and reporting at the indicator level used in this study suggests that high frequency indicators, such as the teaching presence indicator of reinforcing contributions or the cognitive presence indicator of agreeing with and building upon the ideas of another participant or connecting the reading to personal experience, skewed the data toward the category/phase of those indicators (i.e., facilitating discourse in teaching presence and integration in cognitive presence). Issues of clarity of indicator descriptions also influenced the data. Perhaps most importantly, in the cognitive presence construct an important variance in cognitive tasks was detected in the integration phase. Content demonstrating the process of synthesizing information in the text or another student's ideas with one's own were classified at the same level (i.e., integration) as posts with the higher level cognitive processes of creating a solution to a problem or formulating a new hypothesis. The data in this study suggest that an additional phase between integration and resolution may be useful to distinguish from integrating ideas and creating new ones.

Finally, the study examined student perceptions of cognitive presence in relationship to the content-based data and two patterns of discrepancy were found. First, more students agreed with items related to the higher level phases (i.e., integration and resolution) than with the lower level phases (i.e., triggering event and exploration). While this is inconsistent with the foundational premise of the Practical Inquiry (PI) model that the higher level phases build upon the lower levels, it is possible that, due to the phrasing of the items, in the lower level items students were evaluating the process in which they were engaged (i.e., the course

components) at a lower level than their course performance and self-estimation of their abilities to apply the information in the future, as the higher level items reflected. Secondly, a higher percentage of students perceived that they did the cognitive tasks addressed in the higher level items than demonstrated them in the content analysis data. The discrepancy, however, may have been influenced by survey items phrased in the future tense (i.e., "I can…"). Because the survey results of student perceptions reflect students' self-efficacy, the data reveals the caution necessary in interpreting CoI survey results as students *achieving* higher levels of cognitive presence.

Conclusion

This study examined the relationship between teaching and cognitive presence through content analysis of both student and instructor contributions as well as through participant perceptions. The results demonstrate the value of including data outside the discussion board for both students (e.g., a student assignment) and instructors (e.g., course syllabus or announcements) to gain a holistic view of the teaching and learning transaction. The data also raise important questions about the scope of cognitive processes included in the integration phase as well as the precision of teaching presence indicators and suggests the need for further refinement of the coding schemes. The necessity of careful interpretation and cautious generalizations of the research utilizing these coding schemes is therefore suggested. Finally, the data suggest that examining course content at the indicator level may provide the most constructive information for both researchers and educators to use in maximizing the capacity of interactions between student, content and instructor in the online environment to promote students' higher order thinking.

REFERENCES

Abrami, P. C., Bernard, R. M., Bures, E. M., Borokhovski, E., & Tamim, R. M. (2011). Interaction in distance education and online learning: using evidence and theory to improve practice. *Journal of Computing in Higher Education, 23*(2-3), 82-103.

Akyol, Z., Arbaugh, J. B., Cleveland-Innes, M., Garrison, D. R., Ice, P., Richardson, J., & Swan, K. (2009). A response to the review of the Community of Inquiry framework. *Journal of Distance Education, 23*(2), 123-136.

Akyol, Z., & Garrison, D. R. (2008). The development of a Community of Inquiry over time in an online course: Understanding the progression and integration of social, cognitive and teaching presence. *Journal of Asynchronous Learning Networks, 12*(3), 3-22.

Akyol, Z., & Garrison, D. R. (2011a). Assessing metacognition in an online community of inquiry. *The Internet and Higher Education, 14*(3), 183-190.

Akyol, Z., & Garrison, D. R. (2011b). Understanding cognitive presence in an online and blended Community of Inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology, 42*(2), 233-250. doi: 10.1111/j.1467/8535.2009.01029.x

Akyol, Z., Garrison, D. R., & Ozden, M. Y. (2009). Online and blended Communities of Inquiry: Exploring the developmental and perceptional differences. *International Review of Research in Open and Distance Learning*, 10(6), 65-83.

Akyol, Z., Vaughan, N., & Garrison, D. R. (2011). The impact of course duration on the development of a Community of Inquiry. *Interactive Learning Environments, 19*(3), 231-246. doi: 10.1080/10494820902809147

Allen, I. E., & Seaman, J. (2003). Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003. Retrieved from: Sloan Consortium website: http://sloanconsortium.org/publications/survey/sizing_the_opportunity2003

Allen, I. E., & Seaman, J. (2011). Going the distance: Online education in the United States, 2011. Retrieved from: Sloan Consortium website: http://sloanconsortium.org/publications/survey/going_distance_2011

Allen, I. E., & Seaman, J. (2012). *Conflicted: Faculty and online education, 2012.* Retrieved from http://www.eric.ed.gov/pdfs/ed535214.pdf

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives.* New York: Longman.

Anderson, T. (2004). Teaching in an online learning context. In T. Anderson & F. Elloumi (Eds.), *Theory and Practice of Online Learning,* (pp. 273-294). Retrieved from: http://jugense.pbworks.com/f/TPOL_book.pdf#page=305

Anderson, T., Rourke, L., Garrison, D.R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks, 5*(2), 1-17.

Aragon, S. R. (2003). Creating social presence in online environments. *New Directions for Adult and Continuing Education, 2003*(100), 57-68. doi: 10.1002/ace.119

Arbaugh, J.B. (2007). An empirical verification of the Community of Inquiry framework. *Journal of Asynchronous Learning Networks, 11*(1), 73-85.

Arbaugh, J. B., Bangert, A., & Cleveland-Innes, M. (2010). Subject matter effects and the Community of Inquiry (CoI) framework: An exploratory study. *Internet and Higher Education, 13*(1), 37-44.

Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C., & Swan, K. P. (2008). Developing a Community of Inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. *Internet and Higher Education, 11,* 133-136. doi: 1.1016/j.iheduc.2008.06.003

Archer, W. (2010). Beyond online discussions: Extending the community of inquiry framework to entire courses. *Internet and Higher Education,13,* 69.

Bacow, L. S., Bowen, W. G., Guthrie, K. M., Lack, K. A., & Long, M. P. (2012). *Barriers to adoption of online learning systems in U.S. higher education.* Retrieved from ITHAKA S + R website: http://sr.ithaka.org/research-publications/barriers-adoption-online-learning-systems-us-higher-education

Bekele, T. A., & Menchaca, M. P. (2008). Research on internet-supported learning: A review. *The Quarterly Review of Distance Education, 9*(4), 373-405.

Biggs, J. (1979). Individual differences in study processes and the quality of learning outcomes. *Higher Education, 8*(4), 381-394.

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals.* New York: David McKay.

Bloom, B. S., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain.*

Bruner, J. S. (1966). *Toward a theory of instruction* (Volume 59). Cambridge, MA: Harvard University Press.

Casner-Lotto, J., & Barrington, L. (2006). *Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. Workforce.* Washington, D.C.: Partnership for 21st Century Skills.

Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications, Incorporated.

Darabi, A., Arrastia, M.C., Nelson, D.W., Cornille, T., & Liang, X. (2011). Cognitive presence in asynchronous online learning: A comparison of four discussion strategies. *Journal of Computer Assisted Learning, 27*(3), 216-227. doi: 10.1111/j.1365-2729.2010.00392.x

De Wever, B., Schellens, T., Valcke, M., & Van Keer, H. (2006). Content analysis schemes to analyze transcripts of online asynchronous discussion groups: A review. *Computers and Education, 46,* 6-28.

Dewey, J. (1938). *Logic: The theory of inquiry*, 1938. New York, NY: Holt, Rinehart, and Winston.

Diaz, S. R., Swan, K., Ice, P., & Kupczynski, L. (2010). Student ratings of the importance of survey items, multiplicative factor analysis, and the validity of the Community of Inquiry survey. *The Internet and Higher Education, 13*(1), 22-30. doi: 10.1016/j.iheduc.2009.11.004

Dringus, L. P., Snyder, M. M., Terrell, S. R. (2010). Facilitating discourse and enhancing teaching presence: Using mini audio presentations in online forums. *The Internet and Higher Education, 13*(1), 75-77. doi: 10.1016/j.iheduc.2009.11.001

Dziuban, C., Moskal, P., & Hartman, J. (2005). Higher education, blended learning, and the generations: Knowledge is power-no more. In J. Bourne & J.C. Moore (Eds.), *Elements of quality online education: Engaging communities.* Needham, MA: Sloan Center for Online Education.

Garrison, D. R. (2007). Online Community of Inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks, 11*(1), 61-72.

Garrison, D. R., & Anderson, T. (2003). *E-learning in the 21st century: A framework for research and practice.* London, England: RoutledgeFalmer.

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2), 87-105.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education,15*(1),7-23. doi: 10.1080/08923640109527071

Garrison, D. R., Anderson, T., & Archer, W. (2010). The first decade of the Community of Inquiry framework: A retrospective. *The Internet and Higher Education, 13*(1), 5-9. doi: 10.1016/j.iheduc.2009.10.003

Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. The Internet and Higher Education, 10(1), 157-172. doi: 10.1016/j.iheduc.2007.04.001

Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: Interaction is not enough. *The American Journal of Distance Education, 19*(3), 133-148.

Garrison, D. R., Cleveland-Innes, M., & Fung, T.S. (2010). Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the Community of Inquiry framework. *The Internet and Higher Education.13*(1), 31-36. doi: 10.1016/j.iheduc.2009.10.002

Garrison, D. R., Cleveland-Innes, M., Koole, M., & Kappelman, J. (2006). Revisiting methodological issues in transcript analysis: Negotiated coding and reliability. *Internet and Higher Education, 9*(1), 1-8.

Gibson, A. M., Ice, P., Mitchell, R., & Kupczynski, L. (2012). An inquiry into relationships between demographic factors and teaching, social, and cognitive presence. *Internet Learning, 1*(1), 7-17.

Gunawardena, C. N., Lowe, C. A., & Anderson, T. (1997). Analysis of a global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research, 17*(4), 397-431.

Gunawardena, C.N., Ortegano-Layne, L., Carabajal, K., Frechette, C., Lindemann, K., & Jennings, B. (2006). New model, new strategies: Instructional design for building online wisdom communities. *Distance Education, 27*(2), 217-232. doi: 10.1080/01587910600789613

Guri-Rosenblit, S., & Gros, B. E. (2011). E-learning: Confusing termminology, research gaps and inherent challenges. *The Journal of Distance Education, 25*(1), 1-14.

Harasim, L. (2000). Shift happens: Online education as a new paradigm in learning. Internet and Higher Education, 3(1), 41-61.

Hart Research Associates. (2013). Employer priorities for college learning and student success: An online survey among employers conducted on behalf of the Association of American Colleges and Universities (AACU). Retrieved from AACU Web site: http://www.aacu.org/leap/presidentstrust/compact/2013SurveySummary.cfm

Henri, F. (1992). Computer conferencing and content analysis. In A. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden papers* (pp. 117-136). Berlin, Germany: Springer Berlin-Heidelberg.

Kanuka, H. (2005). An exploration into facilitating higher levels of learning in a text-based internet learning environment using diverse instructional strategies. *Journal of Computer-Mediated Communication, 10*(3), article 8. http://jcmc.indiana.edu/vol10/issue3/kanuka.html

Kanuka, H., & Anderson, T. (1998). Online social interchange, discord, and knowledge construction. *The International Journal of E-learning and Distance Education, 13,*(1), 57-74.

Kanuka, H., Rourke, L., & Laflamme, E. (2007). The influence of instructional methods on the quality of online discussion. *British Journal of Educational Technology, 38*(2), 260-271. doi: 10.1111/j.1467-8535.2006.00620.x

Kupczynski, L., Ice, P., Wiesenmayer, R., & McCluskey, F. (2010). Student perceptions of the relationship between indicators of teaching presence and success in online courses. *Journal of Interactive Online Learning, 9*(1), 23-43.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge, U.K.: Cambridge University Press.

Lee, J., Carter-Wells, J., Glaeser, B., Ivers, K., & Street, C. (2006). Facilitating the development of a learning community in an online graduate program. *The Quarterly Review of Distance Education, 7*(1), 13-33.

Maddrell, J. A. (2011). *Community of Inquiry framework and learning outcomes* (Unpublished doctoral dissertation). Old Dominion University, Norfolk, VA.

Maddrell, J. A., Morrison, G. R., & Watson, G. S. (2011, November). *Community of Inquiry framework and learner achievement*. Paper presented at the annual meeting of The Association of Educational Communication and Technology, Jacksonville, FL.

McDonald, J. (2002). Is "as good as face-to-face" as good as it gets? *Journal of Asynchronous Learning Networks, 6*(2), 10-23.

McLoughlin, D., & Mynard, J. (2009). An analysis of higher order thinking in online discussions. *Innovations in Education and Teaching International, 46*(2), 147-160. doi: 10.1080/14703290902843778

Means, B., Toyama, U., Murphy, R., Bakia, M., & Jones, K. (2010). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies*. Washington, D.C.: U. S. Department of Education Office of Planning, Evaluation, and Policy Development.

Merriam, S. B. (2001). Qualitative research and case study applications in education. San Francisco, CA: Jossey-Bass.

Meyer, K.A. (2003). Face-to-face versus threaded discussions: The role of time and higher-order thinking. *Journal of Asynchronous Learning Networks, 7*(3), 55-65.

Meyer, K.A. (2004). Evaluating online discussions: Four different frames of analysis. *Journal of Asynchronous Learning Networks, 8*(2), 101-114.

Mezirow, J. (1991). *Transformative dimensions of adult learning.* San Francisco, CA: Jossey-Bass.

Nonaka, I., Toyama, R., & Konno, N. (2000). SECI, *Ba* and Leadership: A unified model of dynamic knowledge creation. *Long Range Planning, 33*(1), 5-34.

Osman, G., & Herring, S. (2007). Interaction, facilitation, and deep learning in cross-cultural chat: A case study. *Internet and Higher Education, 10*(2), 125-141.

Park, C. L. (2009). Replicating the use of a cognitive presence measurement tool. *Journal of Interactive Online Learning, 8*(2), 140-155.

Parker, K., Lenhart, A., & Moore, K. (2011). *The digital revolution and higher education: College presidents, public differ on value of online learning*. Pew Internet & American Life Project. Retrieved from Pew Research Internet Project website: http://www.pewinternet.org/2011/08/28/the-digital-revolution-and-higher-education/

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Thousand Oaks, CA: SAGE Publications, Inc.

Piaget, J. (1964). Part I: Cognitive development in children. *Journal of Research in Science Teaching, 2*(3), 176-186.

Pisutova-Gerber, K., & Malovicova, J. (2009). Critical and higher order thinking in online threaded discussions in the Slovak context. *The International Review of Research in Open and Distance Learning, 10*(1).

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1-6.

Radford, A. W. (2011). *Learning at a distance: Undergraduate enrollment in distance education courses and degree programs.* Stats in Brief. (Report No. NCES 2012-154). Washington, D.C.: National Center for Education Statistics.

Richardson, J. C., & Ice, P. (2010). Investigating students' level of critical thinking across instructional strategies in online discussions. *Internet and Higher Education, 13*(1), 52-59. doi: 10.1016/j.iheduc.2009.10.009

Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks, 7*(1), 68-88.

Rourke, L., & Anderson, T. (2004). Validity in quantitative content analysis. *Educational Technology Research and Development, 52*(1), 5-18.

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (1999). Assessing social presence in asynchronous text-based computer conferencing. *The Journal of Distance Education, 14*(2), 50-71.

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education, 12*, 3-15.

Rourke, L., & Kanuka, H. (2009). Learning in communities of inquiry: A review of the literature. *Journal of Distance Education, 23*(1), 19-48.

Rovai, A. P. (2007). Facilitating online discussions effectively. *Internet and Higher Education 10*(1), 77-88. doi: 10.1016/j.iheduc.2006.10.001

Russo, T., & Benson, S. (2005). Learning with invisible others: Perceptions of online presence and their relationship to cognitive and affective learning. *Educational Technology & Society, 8*(1), 54-62.

Shea, P., & Bidjerano, T. (2009a). Cognitive presence and online learner engagement: A cluster analysis of the Community of Inquiry framework. *Journal of Computing in Higher Education,21*(3) 199-217. doi: 10.1007/s12528-009-9024-5

Shea, P., & Bidjerano, T. (2009b). Community of Inquiry as a theoretical framework to foster "epistemic engagement" and "cognitive presence" in online education. *Computers & Education, 52*, 543-553. doi: 10.1016/j.compedu.2008.10.007

Shea, P., Fredericksen, E. E., Pickett, A. M., & Pelz, W. E. (2003). A preliminary investigation of "teaching presence" in the SUNY learning network. *Elements of Quality Online Education: Practice and Direction*, Volume 4 in the Sloan-C series. Needham, MA: Sloan-C, 2003.

Shea, P., Hayes, H., Vickers, J., Gozza-Cohen, M., Uzuner, S., Mehta, R., Valchova, A., Rangan, P. (2010). A re-examination of the community of inquiry framework: Social network and content analysis. *Internet and Higher Education, 13*(1), 10-21.

Shea, P., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *The Internet and Higher Education, 9*(3), 175-190. doi: 10.1016/j.iheduc.2006.06.005

Shea, P., Li, C. S., Swan, K., & Pickett, A. (2005). Developing learning community in online asynchronous college courses: The role of teaching presence. *Journal of Asynchronous Learning Networks, 9*(4), 59-82.

Shea, P. J., Pickett, A. M., & Pelz, W. E. (2003). Follow-up investigation of "teaching presence" in the SUNY learning network. *Journal of Asynchronous Learning Networks, 7*(2), 61-80.

Shea, P., Vickers, J., & Hayes, S. (2010). Online instruction effort measured through the lens of teaching presence in the Community of Inquiry framework: A re-examination of measures and approach. *International Review of Research in Open and Distance Learning,11*(3), 127-154.

Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education, 22*(2), 306-331.

Swan, K., Richardson, J., Ice, P., Garrison, D. R., Cleveland-Innes, M., & Arbaugh, J. B. (2008). Validating a measurement tool of presence in online communities of inquiry. *E-mentor, 2*(24), 1-12.

Swan, K., & Shih, L. F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks, 9*(3), 115-136.

Takaya, K. (2008). Jerome Bruner's theory of education: From early Bruner to later Bruner. *Interchange, 39*(1), 1-19. doi: 10.1007/s10780-008-9039-2

Trochim, W. M. (1985). Pattern matching, validity, and conceptualization in program evaluation. *Evaluation Review, 9*(5), 575-604.

Vaughan, N. D. (2010). A blended Community of Inquiry approach: Linking student engagement and course redesign. *The Internet and Higher Education, 13*(1), 60-65. doi: 10.1016/j.iheduc.2009.10.007

Veerman, A., & Veldhuis-Diermanse, E. (2001, March). Collaborative learning through computer-mediated communication in academic education. In Dillenbourg, P., Eurelings, A. & Hakkarainen, K. (Eds.) *European perspectives on computer supported collaborative learning. Proceedings of the first European conference on computer supported collaborative learning.* Maastricht McLuhan Institute, Maastricht.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wallace, R. M. (2003). Online learning in higher education: A review of research on interactions among teachers and students. *Education, Communication and Information, 3*(2), 240-280. doi: 10.1080/1463631032000092046

Wenger, E. (2006, June). Communities of practice: a brief introduction. Retrieved from http://www.ewenger.com/theory

Wilson, B. G., Ludwig-Hardman, S., Thornam, C. L., & Dunlap, J. C. (2004). Bounded community: Designing and facilitating learning communities in formal courses. *The International Review of Research in Open and Distance Learning, 5*(3), 1-22. Retrieved from http://www.irrodl.org/index.php/irrodl/article/viewArticle/204/286

Xin, C. (2012). A critique of the Community of Inquiry framework. *The Journal of Distance Education, 26*(1).

Yang, D., Richardson, J. C., French, B.F., & Lehman, J. D. (2011). The development of a content analysis model for assessing students' cognitive learning in asynchronous online discussions. *Educational Technology Research and Development, 59*(1), 43-70. doi: 10.1007/s11423-010-9166-1

Yin, R. K. (1994) *Case study: Design and methods.* Newbury Park, CA: Sage Publications.

Yin, R. K. (2014). *Case Study Research: Design and Methods.* Los Angeles: Sage Publications.

APPENDIX A

EMAIL INVITING INSTRUCTOR PARTICIPATION

Email to instructors inviting participation

Dear [instructor name],

I am a faculty member at [name of university] and am writing to ask for your assistance in a research project. I am a doctoral student in Educational Technology at Northern Illinois University, currently working on my dissertation, "Examining teaching and cognitive presence in an online Community of Inquiry." I would like to use your class for my research.

Your participation would require you to grant me permission to view your course for content analysis of both the course materials and interactions. Since teaching an online course involves so much more than the discussion board, this would include not only viewing the posts, but also the syllabus, course announcements and other documents providing direction on assignments. In addition, at the end of the course I would like to interview you about your perceptions of the experience. I would also be asking students at the end of the course to complete a survey on their perceptions of both the course and their personal performance.

With your permission, the Blackboard administrator at [name of university housing the course] can give me access to your blank course template for the syllabus and course materials. Once the course has begun, he will assist me to access only the content of the discussion board and the course announcements without actually entering the course. I will only be able to access the posts of students who agree to participate and will not have access to your grade book or assignment feedback.

Allowing me to use your course would not add any extra time or responsibilities to your teaching load for the course. However, I would appreciate it if you would include a statement of "optional activity" (which I can provide for you) in your syllabus to inform students of the opportunity to participate. The interview at the end of the course would be conducted at a time and place of your choosing and will require about 60 minutes of your time.

I will be following the IRB procedures both from Northern Illinois University and [name of university housing the course]. As part of that, if you would agree to participate, I would appreciate it if you could complete the attached consent form and return it to me at your earliest convenience. If you have any questions, please feel free to contact me at [phone number] or [email].

I appreciate your consideration of this project and look forward to hearing from you soon.

Sincerely,
Jennie Asher

APPENDIX B

INSTRUCTOR INFORMED CONSENT

Instructor Informed Consent

I agree to participate in the research project titled "Examining teaching and cognitive presence in an online Community of Inquiry" being conducted by Jennie J. Asher, a graduate student at Northern Illinois University. I have been informed that the purpose of the study is to examine the design, interactions, and learning outcomes of online courses.

I understand that if I agree to participate in this study, I will be asked to do the following:
1. Allow the researcher to examine my course materials, including syllabus, instructions for assignments, and all other materials posted on Blackboard for [course number and title].
2. Allow the researcher to examine my posts in the online discussions.
3. Invite students to participate in this project by including a paragraph about it in my syllabus (as provided by the researcher).
4. Post an announcement in the Blackboard course site the first day of class inviting students to participate (announcement provided by the researcher).
5. Upon completion of the course, participate in a one-hour interview with the researcher, at a time and place of my choosing, to discuss my experience with and beliefs about online teaching and learning.

I am aware that my participation is voluntary and may be withdrawn at any time without penalty or prejudice, and that if I have any additional questions concerning this study, I may contact Jennie Asher at [phone number] or her faculty advisor, Pi-Sui Hsu at [phone number]. I understand that if I wish further information regarding my rights as a research subject, I may contact the Office of Research Compliance at Northern Illinois University at (815) 753-8588 or at [name of university housing the course] at [email of the IRB office at the university housing the course].

I understand that the intended benefits of this study include contributing to the field of educational technology by helping to increase the understanding of online course delivery, interactions, and outcomes. I understand that my students will be asked to complete an evaluation which is not a part of the normal faculty or course evaluation process of the university but which includes questions on the overall course experience, the course activities, as well as my teaching. While I will not be identified in the reporting of results, I understand that due to the small number of instructors participating, my identity may be deduced by administrators who, in the process of granting permission for use of courses, know which courses were used for the study.

I understand that information gathered in this study will be kept confidential. While in reporting conclusions about the online teaching and learning process content examples or brief quotes from posts may be used, neither my identity nor that of the university will be given.

I realize that no compensation will be provided for my participation.

I understand that my consent to participate in this project does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have received a copy of this consent form.

☐ By checking this box, I acknowledge that I have read this consent form and agree to participate as described herein.

☐ By checking this box, I grant my permission for the audio-recording of an interview between myself and the researcher upon completion of the course.

☐ By checking this box and submitting this form as an attachment through my [name of university housing the course] email address I agree and certify that this process fully substitutes for my personal written signature as if I had personally affixed my signature to this form.

APPENDIX C

EMAIL INVITING STUDENT PARTICIPATION

Email inviting student participation

This email was sent to students' university email addresses through the email function in the "dummy course" prior to the start of class. If a student had the function set up, the email was automatically forwarded to the student's personal email address which they have set up upon enrollment at the university.

Dear (student),

Greetings! I am a doctoral student at Northern Illinois University and am writing ask for your assistance in helping me to complete my dissertation. I will be using a course in which you are registered, [course number and title], for my research on online course teaching and learning and would really appreciate it if you would participate. The study, "Examining teaching and cognitive presence in an online Community of Inquiry" will look at the design, interactions, and learning outcomes in online courses.

As a busy college student, you'll be pleased to know that your participation will require as little as ½ hour of your time. Here's what you'll need to do:

1. Complete the "consent form" which is found in a special "course" on Blackboard (*insert link to dummy course*) and grants me permission to examine your discussion board posts and your final project.
2. Complete a demographic survey (only 8 questions) found in the same Blackboard course. This survey will be available to you only after you've submitted the consent form.
3. Complete an end-of-course survey (36 ranking questions and 5 short answer). This will be available to you on the [name of the dummy course] the last week of class.

All information will be kept confidential. Reporting of results will not identify [name of university housing the course] or any individuals by name. Further, your instructor will not know who has agreed to participate or have access to any individual end-of-course surveys.

Details on your participation and assurance of confidentiality are further explained in the attached consent form. If you are willing to participate in this study, please complete this form and return it to me prior to the start of your class. Your participation may be revoked at any time. However, all students who consent to participate and complete both surveys will be entered to win one of four $25.00 amazon.com gift cards to be awarded at the end of the course.

If you have any questions, please feel free to contact me at [phone number] or [email]. I appreciate your assistance with this project!

Jennie Asher

APPENDIX D

BLACKBOARD ANNOUNCEMENT INVITING PARTICIPATION

Announcement appearing in the course site on Blackboard when the course opened

All students are invited to participate in the online learning research project being conducted with our class as subjects. You should have received an email from the researcher, Jennie Asher, describing the project and what it means to agree to participate. Participation will have NO impact on your grade and is strictly voluntary. However, completion of the study gets you the chance to win a $25.00 amazon.com gift card! If you wish to participate and have not yet completed the consent form, please go to [link to the dummy course] and do so ASAP. The email explaining the project can be found in the "course documents" section.

APPENDIX E

STUDENT INFORMED CONSENT

I agree to participate in the research project titled "Examining teaching and cognitive presence in an online Community of Inquiry" being conducted by Jennie J. Asher, a graduate student at Northern Illinois University. I have been informed that the purpose of the study is to examine the design, interactions, and learning outcomes in online courses.

I understand that if I agree to participate in this study, I will be asked to do the following:
1. Complete a demographic questionnaire.
2. Allow the researcher to examine my posts in the online discussions and my final project for the course.
3. Complete an end-of-course survey regarding my perceptions of: the overall course experience, my learning, my interactions with peers, the course activities, and my instructor. This will consist of 36 ranking questions as well as 5 short answer and will require approximately 30 minutes of my time.

I am aware that my participation is voluntary and may be withdrawn at any time without penalty or prejudice, and that if I have any additional questions concerning this study, I may contact Jennie Asher at [phone number] or her faculty advisor, Pi-Sui Hsu at [phone number]. I understand that if I wish further information regarding my rights as a research subject, I may contact the Office of Research Compliance at Northern Illinois University at (815) 753-8588 or at [name of university housing the course] at [email of the IRB office at the university housing the course].

I understand that the intended benefits of this study include contributing to the field of educational technology by helping to increase the understanding of online course delivery, interactions, and outcomes. I have been informed that my participation in this study involves no foreseeable risks to me.

I understand that information gathered in this study will be kept confidential. Survey data will be collected through a secure website with identifying information accessible to the researcher only (and technical support staff, if needed). My instructor will not know whether I'm participating in the study or have access to my survey data, including the end-of-course evaluation. Further, the final surveys will not be analyzed by the researcher until after grades have been submitted. Reporting of the data related to my discussion posts or assignments will not identify either myself or the university.

I realize that no compensation will be provided for my participation, but that I will be entered to win an amazon.com gift card.

I understand that my consent to participate in this project does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have received a copy of this consent form.

☐ By checking this box, I acknowledge that I have read this consent form and agree to participate as described herein.
☐ I do not wish to participate in this study.

☐ By checking this box, I verify that I am 18 years old or older.

☐ By checking this box, I give my permission to be contacted for future studies should follow-up studies be conducted.
☐ I do not wish to be contacted for follow-up studies.

☐ By checking this box and submitting this through my secure account in the [name of university housing the course] Blackboard site I agree and certify that this process fully substitutes for my personal written signature as if I had personally affixed my signature to this form.

APPENDIX F

EMAILS TO NON-RESPONDING STUDENTS INVITING PARTICIPATION

Reminder emails sent to students who did not respond

1. Email sent during first week of class to students who did not yet respond:

Greetings!

Prior to the start of your course, [course number and title], you should have received an email from me inviting you to participate in a research study on online teaching and learning. I see that, to date you have not yet completed the consent form. If you are willing to participate in this study, please go to [link to dummy course] and complete the consent form. If you have questions or would like to discuss the project further, please feel free to contact me at [email] or [phone number].

Your decision to participate will have no impact on your grade for this course. However, you will have the chance to win one of four $25.00 amazon.com gift cards. Further, you can say that you assisted a fellow student in completion of her dissertation! ☺
If you do not have the initial email and would like to review details, it can be found in the course documents section of Blackboard. Thanks for your consideration of this project!

Jennie Asher

note: If you no longer wish to receive emails regarding participation in this study, please let me know at [email].

2. Email sent at the end of the first week of class to students who had not yet responded:

Dear [name of student],

As a student I know that the first week of classes can be very hectic. With all the expectations, your mind's list of "things to do" fills fast and it's easy to overlook something. Prior to the start of your [course number and title] course I sent you an email inviting you to assist me with my dissertation research and participate in my study on online teaching and learning. I see that you have not yet completed the consent form. I would greatly appreciate it if you would complete the form at [link to dummy course] as soon as possible. If you have questions or need more information, please feel free to contact me at [email] or [phone number].

Thank you for your time and consideration!
Jennie Asher

APPENDIX G

COMMUNITY OF INQUIRY SURVEY

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	The instructor clearly communicated important course topics.	5	4	3	2	1
2.	The instructor clearly communicated important course goals.	5	4	3	2	1
3.	The instructor provided clear instructions on how to particiipate in course learning activities.	5	4	3	2	1
4.	The instructor clearly communicated important due dates/time frames for learning activities.	5	4	3	2	1
5.	The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	5	4	3	2	1
6.	The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	5	4	3	2	1
7.	The instructor helped to keep course participants engaged and participating in productive dialogue.	5	4	3	2	1
8.	The instructor helped keep the course participants on task in a way that helped me to learn.	5	4	3	2	1
9.	The instructor encouraged course participants to explore new concepts in this course.	5	4	3	2	1
10.	Instructor actions reinforced the development of a sense of community among course participants.	5	4	3	2	1
11.	The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	5	4	3	2	1
12.	The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.	5	4	3	2	1

13.	The instructor provided feedback in a timely fashion.	5	4	3	2	1
14.	Getting to know other course participants gave me a sense of belonging in the course.	5	4	3	2	1
15.	I was able to form distinct impressions of some course participants.	5	4	3	2	1
16.	Online or web-based communication is an excellent medium for social interaction.	5	4	3	2	1
17.	I felt comfortable conversing through the online medium.	5	4	3	2	1
18.	I felt comfortable participating in the course discussions.	5	4	3	2	1
19.	I felt comfortable interacting with other course participants.	5	4	3	2	1
20.	I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	5	4	3	2	1
21.	I felt that my point of view was acknowledged by other course participants.	5	4	3	2	1
22.	Online discussions help me to develop a sense of collaboration.	5	4	3	2	1
23.	Problems posed increased my interest in course issues.	5	4	3	2	1
24.	Course activities piqued my curiosity.	5	4	3	2	1
25.	I felt motivated to explore content related questions.	5	4	3	2	1
26.	I utilized a variety of information sources to explore problems posed in this course.	5	4	3	2	1
27.	Brainstorming and finding relevant information helped me resolve content related questions.	5	4	3	2	1
28.	Online discussions were valuable in helping me appreciate different perspectives.	5	4	3	2	1

29.	Combining new information helped me answer questions raised in course activities.	5	4	3	2	1
30.	Learning activities helped me construct explanations/solutions.	5	4	3	2	1
31.	Reflection on course content and discussions helped me understand fundamental concepts in this class.	5	4	3	2	1
32.	I can describe ways to test and apply the knowledge created in this course.	5	4	3	2	1
33.	I have developed solutions to course problems that can be applied in practice.	5	4	3	2	1
34.	I can apply the knowledge created in this course to my work or other non-class related activities.	5	4	3	2	1
35.	Overall, I was satisfied with this course	5	4	3	2	1
36.	Overall, I learned a great deal in this course	5	4	3	2	1

Note: Your responses to this survey will be confidential and only used for esearch purposes. Your instructor will not have access to your individual responses.

Adapted from "Developing a Community of Inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample," by J. B. Arbaugh, M. Cleveland-Innes, S. R. Diaz, D. R. Garrison, P. Ice, J. C. Richardson, and K. P. Swan, 2008, *Internet and Higher Education, 11*, p. 135.

APPENDIX H

OPEN-ENDED STUDENT SURVEY QUESTIONS

1. In this course, what one thing did the instructor do that helped you the most in learning? Why was this important for you?
2. If you were the instructor for this course, what would you have done differently to help students learn? Why would you do this?
3. What do you believe is the most important thing for an online instructor to do in order to help students understand the material?
4. What aspect(s) of this course (if any) helped you to integrate new information with prior learning or to create and test solutions to related problems?
5. How will you use the information you learned in this course in other situations, such as your future vocation or in other course(s)?

APPENDIX I

TEACHING PRESENCE CODING SCHEME

Teaching Presence Coding Scheme				
Elements	**Categories**	**Indicators**	**Code**	**Examples**
Teaching Presence • The design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes.	Design & Organization • Design is but a flexible template, created with the expectation that specific issues and needs will inevitably arise that will necessitate alterations in the course of action • Organization should reflect the flexible and non-prescriptive nature of any educational experience	•Setting curriculum	TP-DE-1	• "This week we will be discussing…"
		•Designing methods	TP-DE-2	• "I am going to divide you into groups, and you will debate…"
		•Establishing time parameters	TP-DE-3	• "Please post a message by Friday…"
		•Utilizing medium effectively	TP-DE-4	• "Try to address issues that others have raised when you post"
		•Establishing netiquette	TP-DE-5	• "Keep your messages short"
		•Making macro-level comments about course content	TP-DE-6	• "This discussion is intended to give you a broad set of tools/skills which you will be able to use in deciding when and how to use different research techniques"
	Facilitating Discourse •Enabling and encouraging the construction of personal meaning as well as shaping and confirming mutual understanding •Fusion of purpose, process and outcome •Convergence of interest, engagement and learning	•Identifying areas of agreement/disagreement	TP-FD-1	• "Joe, Mary has provided a compelling counter-example to your hypothesis. Would you care to respond?"
		•Seeking to reach consensus	TP-FD-2	• "I think Joe and Mary are saying essentially the same thing"
		•Encouraging, acknowledging, or reinforcing student contributions	TP-FD-3	• "Thank you for your insightful comments"
		•Setting climate for learning	TP-FD-4	• "Don't feel self-conscious about 'thinking out loud' on the forum. This is the place to try out ideas, after all"

Teaching Presence Coding Scheme, continued				
Elements	**Categories**	**Indicators**	**Code**	**Examples**
	Facilitating Discourse, continued	• Drawing in participants, prompting discussion	TP-FD-5	• "Any thoughts on this issue?" • "Anyone care to comment?"
		• Assessing the efficacy of the process	TP-FD-6	• "I think we're getting a little off track here"
		• Sharing Experience	TP-FD-7	• "This is what we did…"
	Direct Instruction • Most often associated with specific content issues such as diagnosing misconceptions • Disciplinary expertise and efficient shaping of the learning experience are essential aspects of any educational experience • Systematically building learning experiences (i.e., scaffolding) to achieve intended, higher-order learning outcomes	• Present content/questions	TP-DI-1	• "Bates says…what do you think"
		• Focus the discussion on specific issues	TP-DI-2	• "I think that's a dead end. I would ask you to consider…"
		• Summarize the discussion	TP-DI-3	• "The original question was…Joe said…Mary said…we concluded that…We still haven't addressed…"
		• Confirm understanding through assessment and explanatory feedback	TP-DI-4	• "You're close, but you didn't account for…" • "…this is important because…"
		• Diagnose misconceptions	TP-DI-5	• "Remember, Bates is speaking from an administrative perspective, so be careful when you say…"
		• Inject knowledge from diverse sources e.g. textbook, articles, internet, personal experience (includes pointers to resources)	TP-DI-6	• "I was at a conference with Bates once, and he said… • "You can find the proceedings from the conference at http://www…"
		• Responding to technical concerns	TP-DI-7	• "If you want to include a hyperlink in your message, you have to…"

Note. Coding scheme adapted from "Assessing teaching presence in a computer conferencing context," by T. Anderson, L. Rourke, D.R. Garrison, and W. Archer, 2001, *Journal of Asynchronous Learning Networks, 5*(2), p. 6-10.

APPENDIX J

COGNITIVE PRESENCE CODING SCHEME

Cognitive Presence Coding Scheme						
Elements	**Phase**	**Descriptor**	**Indicators**	**Code**	**Socio-cognitive processes**	**Examples**
Cognitive Presence • The extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry	Triggering Event	Evocative (inductive) • Stimulate one's curiosity • Core organizing concept or problem • Dilemma or problem that learners can relate to from their experience or previous studies • Framing the issue and eliciting questions or problems that learners see or have experienced • Assessing state of learners' knowledge and generating unintended but constructive ideas	• Recognize problem	CP-TE-1	• Presenting background information that culminates in a question	It has been argued that the only way to deliver effective distance education is through a systems approach. However, this approach is rarely used. Why do you think that is?
			• Sense of puzzlement	CP-TE-2	• Asking questions • Messages that take discussion in a new direction	
	Exploration	Inquisitive (divergent) • Understand the nature of the problem and then search for relevant information and possible explanations • Group activities – brainstorming • Private activities – literature searches • Manage and monitor this phase of divergent thinking in such a way that it begins to be more focused	• Divergence – within the online community	CP-EX-1	• Unsubstantiated contradiction of previous ideas	One reason that I think a systems approach is seldom used is that it is too complicated to get cooperation. Another may be the mind-sets of those in charge to change practices.
			• Divergence – within a single message	CP-EX-2	• Many different ideas/themes presented in one message	
			• Information exchange	CP-EX-3	• Personal narratives/descriptions/facts (not used as evidence to support a conclusion)	
			• Suggestions for consideration	CP-EX-4	• Author explicitly characterizes message as exploration, e.g., "Does that seem about right?" "Am I way off the mark?"	
			• Brainstorming	CP-EX-5	• Adds to established points but does not systematically defend/justify/develop	

Cognitive Presence Coding Scheme, continued						
Elements	**Phase**	**Descriptor**	**Indicators**	**Code**	**Socio-cognitive processes**	**Examples**
	Exploration, continued	Inquisitive (divergent), continued	• Leaps to conclusions	CP-EX-6	• Offers unsupported opinions	
	Integration	Tentative (convergent) • Focused and structured phase of making meaning • Decisions are made about integration of ideas • Teacher must probe for understanding and misconceptions	• Convergence – among group members	CP-IN-1	• Reference to previous message followed by substantiated agreement (e.g., "I agree because…") • Building on, adding to others' ideas	We also had trouble getting cooperation. Often the use of new tools requires new organizational structures. We addressed these issues when we implemented a systems approach, and I think that's why we were successful.
			• Convergence – within a single message	CP-IN-2	• Justified, developed, defensible, yet tentative hypotheses	
			• Connecting ideas, synthesis	CP-IN-3	• Integrating information from various sources – text book, articles, personal experience	
			• Creating solutions	CP-IN-4	• Explicit characterization of message as a solution by participant	
	Resolution/Application	• Resolution of the dilemma or problem • Reducing complexity by constructing a meaningful framework or discovering a contextually specific solution • Confirmation or testing phase may be accomplished by direct or vicarious action	• Vicarious application to real world testing solutions	CP-RE-1	• Providing examples of how problems were solved	How we solved this problem was…?
			• Defending solutions	CP-RE-2	• Defending why a problem was solved in a specific manner	

Coding scheme from "Critical thinking, cognitive presence, and computer conferencing in distance education," by D.R. Garrison, T. Anderson, and W. Archer, 2001, *American Journal of Distance Education,15*(1), p. 15-16.

APPENDIX K

INSTRUCTOR INTERVIEW QUESTIONS

Instructor Interview Questions

1. Tell me about your previous experience in online teaching and learning (both taking course and teaching).
2. In your view, what are the benefits of online learning?
3. Describe your view of the role of the online teacher.
4. If you could "design" an ideal online teacher, what would s/he be like (personal qualities, personality, etc.)?
5. What do you believe is your most important role as an online teacher: designing and organizing the course (including altering course elements as needed), facilitating the discourse in the course to assist students in gaining understanding, or providing direct instruction such as presenting content or diagnosing misconceptions and confirming students' understanding? Why do you believe that to be the most important?
6. What pleased you about the course you just taught? (i.e. regarding student performance, your teaching, etc.)
7. What do you wish would have been different in the course you just taught?
8. Is this (#6 answer) something you would be able to change if you taught this course again? If so, what would you do to change it?
9. Overall, how would you assess the students' understanding of the material presented in the course? How capable do you think they would be in using this knowledge in another situation?
10. What advice would you give to an instructor teaching his/her first online class?

APPENDIX L

DEMOGRAPHIC SURVEY

Demographic survey completed on Blackboard

Name Click here to enter text.

1. Class ☐ Freshman ☐Sophmore ☐Junior ☐Senior
2. Age Click here to enter text.
3. Gender ☐Male ☐Female
4. Major Click here to enter text.
5. Registration Status ☐Full time ☐Part time
6. Employment Status ☐Full time ☒Part time
7. Number of previous online courses Click here to enter text.
8. Level of computer proficiency ☐novice ☐basic ☐proficient ☐ expert

Note: Your responses to this survey will be confidential and only used for research purposes. Your instructor will not have access to your individual responses.

APPENDIX M

CODING SCHEME CLARIFICATIONS

Coding Scheme Clarifications

Content	Possible Category	Possible Codes	Indicator	Cognitive Processes	Guideline = Source	Guideline = Implied Intent	Guideline = Supports conclusion?
Sharing experience	TP-Facilitating Discourse - enabling and encouraging personal construction of meaning; shaping and confirming group understanding; convergence of purpose, interest, outcome, process	TP-FD-7	Sharing Experience	NA	Teacher post or student post meeting guide-line 2 &/or 3	Benefit of (another) student - engage in discourse, to encourage construction of meaning, to shape understanding.	NA
	TP- Direct Instruction - specific content issues, sharing expertise, shaping and building learning experiences	TP-DI-6	Inject knowledge from diverse sources (e.g. personal experience)	NA	Teacher post or student post meeting guideline 2 &/or 3	Benefit of (another) student - giving more information for integration in understanding the issue	NA
	CP- Exploration - inquisitive, understanding the problem, search for information, brainstorming, move toward focus	CP-EX-3	Information Exchange	Personal narratives/description s/facts	Student post	Exploring an aspect of the topic to gain understanding	Not used as evidence to support a conclusion; simply added another example or more information
	CP- Integration - Convergent, focused & structured meaning making, integration of ideas	CP-IN-3	Connecting ideas, synthesis	Integrating information from various sources	Student post	Integrating experience with other information to make sense of the topic	Supports a conclusion or defends a hypothesis

Sharing Experience, cont.	CP- Resolution - resolution of the problem, constructing meaningful model or solution, confirm through testing	CP-RE-1	Vicarious application to real world testing solutions	Provide examples of how problems were solved	Student post	Tells how a problem was solved	Solution had been proposed and the experience shows whether or not it worked OR demonstrates why the solution was appropriate.
Questioning or "wondering"	TP - Facilitating Discourse -	TP-FD-5	Drawing in participants, prompting discussion	NA	Instructor post OR student post meeting criteria 2 &/ or 3	Directly invites a response from another student; asks for clarification or resource(s)	NA
	CP - Triggering Event - stimulate curiosity, organizing concept or problem, present dilemma or problem, eliciting questions	CP-TE-1	Recognize Problem	Presenting background information culminating in a question	Student post	reflects personal curiosity; "thinking out loud"	not integrated or part of a solution/ hypothesis
	CP - Triggering Event -	CP-TE-2	Sense of Puzzlement	Asking questions; taking discussion in a new direction	Student post	reflects personal curiosity; "thinking out loud"	not integrated or part of a solution/ hypothesis
Statements about curriculum &/or content	TP- Design and Organization - creating and communicating a flexible template for the course of action	TP-DE-1	Setting Curriculum	NA	Instructor post or student post reinforcing established curriculum	Describing the curriculum (e.g. listing course objectives or units)	NA
	TP- Design and Organization	TP-DE-6	Making macro-level comments about course content	NA	Instructor post or student post reinforcing established curriculum	Primarily reflects the intent or purpose of the task (i.e. *why* it's being done/read/discussed or how it will benefit students)	NA

Quotation(s) from text- book or article(s)	TP - Direct Instruction	TP-DI-1	Present content/ questions	NA	Instructor post OR student post meeting criteria 2 &/or 3	Sharing knowledge with peers, non-class resource, shared to present background for question	not integrated or part of a solution/hypothesis; culminates in question
	TP - Direct Instruction	TP-DI-6	Inject knowledge from various sources	NA	Instructor post OR student post meeting criteria 2 &/or 3	Sharing knowledge with peers, non-class resource	not integrated or part of a solution/hypothesis; not culminating in a question
	CP - Exploration	CP-EX-2	Divergence - within a single message	Many different ideas/themes in one message	Student post	Course material or outside material; for making meaning	Restating course or other material; not connected to other ideas or a hypothesis/ conclusion
	CP- Integration	CP-IN-3	Connecting ideas, synthesis	Integrating information from various sources	Student post	Course material or outside material; for making meaning; comparison, contrast or synthesis	Integrated with other information (e.g. personal experience or another student's post) to support a hypothesis or create a solution
Technology issues	TP- Design and Organization	TP-DE-4	Utilizing medium effectively	NA	Instructor post or student helping a peer	Emphasizes how a certain way of using the course management system will enhance the learning experience	NA
	TP- Direct Instruction	TP-DI-7	Responding to technical concerns	NA	Instructor post or student helping a peer	Aims to make the technology easier or more efficient to use	NA

Statements of reinforcement (e.g. "You're right") or acknowledgment (e.g. "very interesting"),	TP - Facilitating Discourse	TP-FD-3	Encouraging, acknowledging, or reinforcing student contributions	NA	Instructor post or student responding to a peer	Conveys approval of post content, level of insight, &/or contribution	NA
	TP- Direct Instruction	TP-DI-4	Confirm understanding through assessment and explanatory feedback.	NA	Instructor post or student responding to a peer	Offers further information or correction (e.g. "I appreciated your… *however*…")	NA
	CP- Exploration	CP-EX-3	Information Exchange	Personal narratives/ descriptions/ facts	Student post	Not used to support conclusion	Not used to support a conclusion, just shares similar experience
	CP- Integration	CP-IN-1	Convergence among group members	Reference to previous message followed by substantiated agreement/ disagreement	Student post	Acknowledging peer and building on through agreement OR "However…" and disagreement	Integrates peer's post with additional information; adds more support for an idea/ hypothesis/ conclusion
	None- feedback	Feed-back	General feedback	NA	Instructor post	Reinforces methods or time parameters &/or connects grading criteria to comment	NA

Note. Descriptions of codes are found in Appendix ___ and ___. FD = teaching presence facilitating discourse; DI = teaching presence direct instruction; EX = cognitive presence exploration; IN = cognitive presence integration; RE = cognitive presence resolution.