DEVELOPMENT AND VALIDATION OF THE COMMUNITY OF INQUIRY PROGRAM-LEVEL INVENTORY

by

Carolyn Elaine Moen

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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ABSTRACT

Online education is becoming increasingly prevalent in higher education with many students and educators accepting its use. Because of the ubiquity of online education and the growth of technology in recent decades, it is important for educators to use educational methods that maximize the potential quality of online education. The Community of Inquiry (CoI) framework is a model of online education that emphasizes the importance of the learning community in the educational process. The CoI posits that effective learning environments must have strong cognitive, social, and teaching presences. There is numerous research that supports the use of the CoI in online learning environments. The purpose of the present research is to develop and validate an instrument, the Community of Inquiry Program-Level Inventory (CPI), for assessing the CoI in online academic programs. Students enrolled in online graduate degree programs completed the CPI and other measures in an online survey. Exploratory factor analysis revealed a four-factor model, and confirmatory factor analysis showed a good model fit with four factors. The subscales for the cognitive presence and social presence each emerged as single factors. The subscale for the teaching presence was divided into two distinct factors with items relating to instructional design in one factor and items relating to facilitating discourse and direct instruction in a second factor. These findings contribute to the research literature on the CoI and highlight the importance of the CoI in online academic programs.

Keywords: online education, community of inquiry, program evaluation

Dedication

To Jaxon

Thank you for your steadfast friendship and unconditional love.

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Dr. Fred Volk – You are the truest of scholars, mentors, and friends. I am ever inspired by your passion and the way you pour your heart into the work we do. Your intellect and academic rigor are extraordinary, but your greatest qualities are found in the person you are. Your genuine love for people, kind heart, generosity, deep compassion, ability to always see the good in people, and love of redemption stories are qualities unmatched in anyone I have ever met. Over the last five years as your teaching assistant, I have watched you take the time to mentor countless students with the goal of helping them find the best versions of themselves. I am proud to always be one of yours. Thank you for always being there to shake it off with me when things get hard. Thank you for the encouragement, confidence, criticism, recommendations, and tidbits.

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CHAPTER ONE: INTRODUCTION

With the growth of technology and the internet, online education has greatly expanded in recent decades (Allen & Seaman, 2016), but instructional methods and research have not adapted as quickly as technology has advanced and there is a need for information on effective online education in the current state of online higher education (Nguyen, 2015). In an effort to understand the dynamics of the increasingly popular online educational environments of higher education, Garrison, Anderson, and Archer (1999) proposed the Community of Inquiry (CoI) framework. The CoI framework posits that education based in computer-mediated communication must include strong elements of cognitive presence, social presence, and teaching presence. Research on the CoI framework supports its usefulness in predicting student learning and persistence (Garrison & Arbaugh, 2007), and a measurement instrument has been designed to measure the CoI of online courses (Arbaugh et al., 2008). However, there is still a need for an instrument to measure the CoI of online programs (Kumar, Dawson, Black, Cavanaugh, & Sessums, 2011). The purpose of the present research is to adapt the existing instrument to create a measure that assesses the CoI presences of online academic programs.

Background of the Problem

Online education has become increasingly popular over the last few decades and is gaining acceptance among students and academic leaders (Allen & Seaman, 2016). About 31.6% of college students are enrolled in online courses with almost half of them (14.9% of all college students) enrolled exclusively in online courses (Seaman, Allen, & Seaman, 2018). Academic leaders tend to be accepting of online education with 71.4% of them reporting that they believe

the quality of online education is equal to or better than traditional higher education (Allen & Seaman, 2016). Online education is growing in popularity with students and in acceptance with academic leaders, so it is important for educators to learn and use educational methods that are effective in online education (McPherson & Bacow, 2015).

The characteristics of online learning environments are distinctly different from those of face-to-face learning environments, and designers of online courses need to take the unique characteristics into account (McPherson & Bacow, 2015). Students may select online education because of the positive aspects of completing courses online. Online education has an enhanced potential for personalization to meet the needs of individual students (Willcox, Sarma, & Lippel, 2016). Students can work at a pace that suits their needs and select convenient times and places to complete their schoolwork. Online education is also more cost-effective for both students and schools, which makes education available to many people who would otherwise be unable to pursue a college degree (McPherson & Bacow, 2015). With the many inherent benefits of online education, it is clear why it is popular among students; however, some educators still have doubts about how the quality of online education compares to that of traditional education (Allen & Seaman, 2013).

Research comparing the quality and outcomes of online and residential education tends to have mixed results, but there is reason to believe that online education has the potential to be as effective as residential education. A literature review of research comparing online and residential education found that 92% of studies concluded that online education is as effective as or better than residential education, but the literature review also emphasized the tendency for studies in this area to have notable methodological limitations (Nguyen, 2015). When comparing students enrolled in online and traditional formats of the same course taught by the same

instructor, students tend to achieve similar grades and give similar evaluations of the course (Stack, 2015). Students in a traditional course have been shown to perform slightly better than students in a hybrid course, but researchers argue the slight reduction in grades is compensated for by the convenience of online courses (Joyce, Crockett, Jaeger, Altindag, & O'Connell, 2015). Other research contradicts this finding by showing that students in a hybrid course tended to earn better grades than students in a traditional course (Page, Meehan-Andrews, Weerakkody, Hughes, & Rathner, 2017).

In addition to the course-level comparison of online and residential education, there is also research that focuses on educational programs. When comparing grades, competency levels, and student satisfaction, students in the residential and online formats of the same master of social work degree program were found to be similar (Cummings, Chaffin, & Cockerham, 2015). Research on online education has shown promising results that suggest it may be as effective as residential courses; however, regardless of its average or potential quality, online education appears to be a permanent part of higher education, so it is important to find methods that make it effective (Nguyen, 2015). The goal of the present study is to advance the current research on online education by creating a measure for online program evaluation.

Purpose of the Study

Online education appears to be a lasting form of higher education, so it is important for educators to know how to implement online educational methods that lead to effective learning outcomes (Nguyen, 2015). The CoI framework is a model for effective online education that emphasizes the importance of strong cognitive presence, social presence, and teaching presence for learning in an online learning environment (Garrison et al., 1999). In order to assess the three CoI presences in online courses, the Community of Inquiry Framework Survey Instrument was

developed (Arbaugh et al., 2008). It has been shown to be a valid instrument (Bangert, 2009) and has been used in numerous publications to measure the CoI in online courses (Stenbom, 2018). While the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) measures the CoI in online academic courses, there is still a need for an instrument that assesses the CoI in online academic programs (Kumar et al., 2011). The purpose of this study is to develop, test, and validate a measure for assessing the CoI of online programs.

Research Questions

The purpose of this study is to develop a valid scale for measuring the CoI in online academic programs. The Community of Inquiry Program-Level Inventory (CPI) was created by modifying each question in the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) to reflect program-level inquiry instead of course-level inquiry. To test the validity of the new CPI, I used exploratory factor analysis to find the latent factor structure that emerges. I then used confirmatory factor analysis to determine if data from a second sample reveal a factor structure that matches the model fit from the data of the first sample. After determining the factor structure of the CPI, I tested its convergent validity by comparing its correlation with other scales that measure similar constructs.

In order to test the factor structure of my scale, I used the following research questions:

1. What are the latent constructs that emerge from the items in the CPI?
2. Does the data from a second sample have a good model fit with what was found in the first sample?
3. Are the CPI subscales related to other measures in a way that is theoretically consistent?

Assumptions and Limitations

This study has some inherent assumptions and limitations, which include the assumption that the CoI presences are important for learning and the limitations of self-report data and voluntary participation. The CoI framework is a conceptual model that posits that effective learning environments require strong cognitive, social, and teaching presences (Garrison et al., 1999). The assumption that the CoI presences are beneficial to learning is an inherent assumption of the CoI framework, which means that it is also an inherent assumption of the present research. The claim that the deepest and most meaningful learning occurs within a social context was widely held by educators before the introduction of the CoI framework, so the CoI's conceptualization of learning is deeply rooted in broadly accepted assumptions about learning (Garrison & Anderson, 2003).

All of the data for this study was obtained through voluntary self-report so it is important to acknowledge that the assumptions and limitations of self-report and voluntary participation should be considered. Participants were students recruited through an email from their academic programs. It is assumed that students were honest in their responses and that their responses were not affected by any possibility of negative social or academic consequences. While all students in the represented academic programs received emails requesting participation, only a subset of students chose to participate in this study. It is not known if or how the students who chose to participate differ from the students who chose not to participate, and it is not known if or how any differences may have affected the data for this study.

Definition of Terms

In this section, I will describe some pertinent terms that will be important to understand as I discuss my research.

Asynchronous Communication

Asynchronous communication is any social experience that occurs with people communicating at different times (Kirby & Hulan, 2016; Vogler et al., 2013). This term is used to describe any communication between people who are not engaging the discussion at the same time. In online education, asynchronous learning may take the form of text-based discussions (e.g., discussion boards), video recordings, or other mediums.

Blended Courses or Hybrid Courses

The terms blended courses and hybrid courses are both used to describe courses that are in between traditional and online (Joyce et al., 2015; Page et al., 2017). These terms are synonymous and are generally used interchangeably in research literature. There are usually strong online components intertwined with a reduced amount of classroom time. There is not a standard ratio for the combination of traditional and online instruction, and publications that use these terms may use them to apply to a broad range of courses.

Cognitive Presence

Cognitive presence is one of the three CoI presences, and it involves deep intellectual engagement with the subject matter (Garrison et al., 1999). Cognitive presence is an essential element of learning in the CoI, and it may be the most important presence for facilitating deep and meaningful learning (Garrison & Anderson, 2003). This construct is operationalized by the cognitive presence subscale of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008).

Community of Inquiry (CoI)

The Community of Inquiry (CoI) is a conceptual framework for educational environments suggesting that for deep and meaningful learning to occur in any learning

environment, it is important to cultivate strong cognitive presence, social presence, and teaching presence (Garrison et al., 1999). The CoI has two decades of research and practice that support its usefulness in developing effective online learning environments (Stenbom, 2018). It is operationalized by the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008), which measures the overall CoI in an online course and has subscales to measure each of the three presences in an online course.

Social Presence

Social presence is one of the CoI presences, and it involves discussions about course material and any class interactions that promote group cohesion among students (Garrison et al., 1999). Social presence is important because interactive discussions help promote the intellectual engagement of cognitive presence and because group cohesion helps to encourage feelings of belonging and commitment (Rourke, Anderson, Garrison, & Archer, 1999). This construct is operationalized by the social presence subscale of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008).

Synchronous Communication

Synchronous communication involves social interactions with all participants actively engaged at the same time (Benshoff & Gibbons, 2011; Thompson et al., 2017). It occurs in a variety of mediums including text-based, video, or audio discussions.

Teaching Presence

Teaching presence is one of the three CoI presences, and it involves all of the typical instructional roles of a teacher (Garrison et al., 1999). Teaching presence includes presenting information, providing critical feedback, and managing the content and calendar of courses

(Anderson et al., 2001). This construct is operationalized by the teaching presence subscale of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008).

Significance of the Study

The significance of the present research is that the resulting inventory will be a valuable tool for academicians to assess the CoI presences in online academic programs. There is currently a need for a measure that assesses the CoI in online academic programs (Kumar et al., 2011). If the CoI presences are essential for learning in online academic environments (Garrison et al., 1999), it is important for online academic programs to have strong cognitive, social, and teaching presences throughout the programs. A course-level evaluation measure, such as the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008), is insufficient to measure the CoI of academic programs because the whole program experience cannot be explained by simply considering the coursework. The present research will help bridge the current gap in the literature by developing and validating a measure to assess the CoI in online academic programs.

Theoretical and Conceptual Framework

In the current arena of higher education, online educational methods are quickly becoming part of the norm (Allen & Seaman, 2016) and there is a need for educators to find methods for effective education in online courses and programs (Nguyen, 2015). The CoI framework is a model built on the assumption that the aspects of traditional higher education that facilitate learning are the cognitive presence, social presence, and teaching presence and online higher education can produce quality learning if it possesses these three presences (Garrison et al., 1999). The purpose of the CoI framework is to give educators a model for effective education and guide them as they make decisions about educational methods and course design (Garrison

& Anderson, 2003). It helps give instructors a conceptual framework to decide what aspects of online educational environments are necessary for learning to occur.

The three CoI presences (i.e., cognitive presence, social presence, and teaching presence) are distinct constructs that influence and overlap with each other (Garrison et al., 1999). Cognitive presence is considered the most crucial presence because of its direct influence on learning, and it involves active critical thinking and meaningful engagement with the course material (Garrison & Anderson, 2003). Social presence includes interactive dialogue about course material and reflective responding to the ideas of others, which supports the cognitive presence because students are intellectually engaged as they dialogue (Rourke et al., 1999). Teaching presence is made up of instructors' roles as course facilitator, lecturer, and guide, which serve to support both the cognitive presence and the social presence (Anderson, Rourke, Archer, & Garrison, 2001). The three CoI presences have individual effects and a combined effect on learning outcomes, and they make up the essential elements of an effective learning environment (Garrison et al., 1999).

Since its introduction, the CoI framework has been the topic of numerous publications that support the importance of the three presences in online learning environments (Stenbom, 2018). The progression of research on the CoI over the past two decades includes the development of a scale (Arbaugh et al., 2008) and suggestions for increasing the strength of the three presences in online learning environments (Kumar et al., 2011). In an effort to create a measure for the CoI, the Community of Inquiry Framework Survey Instrument was developed to measure the three CoI presences in online courses (Arbaugh et al., 2008). It is a valid measure (Bangert, 2009) that is commonly used to measure the CoI presences in research literature (Stenbom, 2018). While the Community of Inquiry Framework Survey Instrument (Arbaugh et

al., 2008) is an effective measure of the CoI presences in online courses, there is currently a need for a measure to assess the CoI presences in online academic programs (Kumar et al., 2011). The development of a method for measuring the CoI in online academic programs is a logical next step in the progression of the development of the CoI framework, and it is the current gap in the research literature that the present study seeks to address.

Organization of the Remaining Chapters

In the next chapter (Review of the Literature), I will provide a description of relevant literature in the areas of online education, the CoI, and methods for program evaluation. In chapter three (Method), I will describe in detail each part of my research including the research design, participants, instrumentation, research procedures, data processing, and statistical analysis. In the fourth chapter (Results), I will present the results of my study. In the fifth chapter (Summary, Conclusions, and Recommendations), I will discuss the results of my study and describe conclusions and recommendations.

Summary

In this chapter, I gave an introduction to my research topic and demonstrated its importance. I described the background of online education, which included an emphasis on the ubiquitous presence of online education in current higher education (Allen & Seaman, 2016) and the need for educators to learn and use methods in online education that produce learning (Nguyen, 2015). I explained that the purpose of this study is to develop and validate a measure that assesses the CoI in online academic programs, which I accomplished by modifying the questions in the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008). I discussed and listed the research questions that I used to guide my inquiry, and I explained the assumptions associated with the CoI and the limitations of voluntary self-report data. I presented

and defined the terms that I use in this research. I discussed the significance of this study emphasizing the need for a measure for program-level assessment of the CoI (Kumar et al., 2011), and I described the theoretical and conceptual framework of the CoI as it relates to this study. In the next chapter, I will describe and discuss the research literature about online education, the CoI, and program evaluation.

CHAPTER TWO: REVIEW OF THE LITERATURE

In the previous chapter, I introduced my research on developing and validating a program-level Community of Inquiry (CoI) measure. Online education has become a staple of higher education that is continuing to increase in popularity and acceptance each year (Allen & Seaman, 2016). Because of the presence of online education, educators have the task of finding methods of online instruction that produce high-quality learning outcomes (Nguyen, 2015). The CoI framework, which was developed to give educators a conceptual model to guide their choices, posits that quality learning occurs in learning environments with strong cognitive presence, social presence, and teaching presence regardless of the delivery medium (Garrison et al., 1999). There is currently a measure for assessing the CoI presence in online courses (Arbaugh et al., 2008), but there is a need for a valid scale that measures the CoI of online academic programs (Kumar et al., 2011). The purpose of this study is to design and validate a scale that measures the CoI of online academic programs.

In this chapter, I will present the relevant research literature about online education, the CoI, and program evaluation. I will describe the growth and prevalence of online mediums in higher education (Allen & Seaman, 2016), give an overview of literature that compares traditional and online educational environments, emphasize that online education appears to be here to stay regardless of its quality, so educators need to find methods to make it effective (Nguyen, 2015), and discuss the current best practices in online education. I will then discuss the CoI, describe its theoretical foundations, and provide details about the characteristics and promotion of the cognitive, social, and teaching presences. I will describe the Community of

Inquiry Framework Survey Instrument (Arbaugh et al., 2008) and demonstrate the need for a program-level measure of the CoI. Finally, I will present other program evaluation methods and explain why they are not sufficient to measure the CoI of online academic programs. This chapter demonstrates the need for the development of a measure to assess the CoI of online academic programs. I will begin my review of the literature in the next section with a discussion of the research on online higher education.

Online Higher Education

Growth in Acceptance

Over the last several decades, the popularity of online education has increased and resulted in a fundamental change in higher education in the United States. The percentage of college students enrolled in online courses steadily increases each year without any signs of reaching a plateau (Allen & Seaman, 2016). In 2016, 31.6% of college students in the United States were enrolled in at least one online course with 14.9% of all students enrolled exclusively in online courses (Seaman et al., 2018). Academic leaders are also accepting of online education with the majority (71.4%) reporting they believe that the quality of online education is similar or superior to the quality of face-to-face courses (Allen & Seaman, 2016). With both students' and academic leaders' acceptance of online educational methods, there is a need for information on how to develop practices that produce effective and satisfactory learning experiences for students (McPherson & Bacow, 2015).

The trends in online education suggest that it will continue to have a lasting presence in higher education, and it is the responsibility of educators to ensure the quality of education in whatever format it is offered. Surveys of academic leaders show that they are somewhat reluctant to fully embrace online education because of the greater need for self-discipline in students and

the potential for lower retention rates (Allen & Seaman, 2013). A primary benefit of and rationale for online educational courses is that they tend to be more cost-effective for students and schools, but the reduction in cost may be accompanied by a reduction in educational quality if educators do not develop methods for providing quality education in the online format (McPherson & Bacow, 2015). Supporters of online education emphasize its potential to offer a personalized educational experience to meet the needs of each student (Willcox, Sarma, & Lippel, 2016). The reduced cost, potential for personalization, and flexible nature of online coursework give higher education access to populations of people who would be unable to pursue a face-to-face education due to financial and time constraints (McPherson & Bacow, 2015).

In their important review of the history of online education, McPherson and Bacow (2015) published a summary of the history of online education that included some conclusions about its current state and suggestions for future directions. Most importantly, they use empirical literature to make arguments about important topics for researchers and educators, and they ultimately conclude that the future of online higher education has the possibility of being very fruitful or it could permanently damage the quality of higher education. The other sources cited in the above paragraph (Allen & Seaman, 2016; Seaman, Allen, & Seaman, 2018; Willcox et al., 2016) were all reports of the status and statistics of online education, which are appropriate sources of information on the current state of online higher education.

Online education appears to be a permanent part of higher education with many educational leaders accepting its presence and its continued expansion in use (Allen & Seaman, 2016). This is a pivotal time in the development of online higher education, which could result in the development of practices that produce quality education or in the diminishment of

educational standards in higher education, so it is important to focus on finding methods for achieving high educational standards in online education (McPherson & Bacow, 2015). Because online higher education is an extension of residential higher education, I will start my description of online education by reviewing the research on how it compares to residential educational methods.

Compared to Residential Courses

There is promising research showing that educational outcomes tend to be similar when comparing students in residential and online formats of the same courses. Students enrolled in either an online or residential format of an otherwise identical course in criminology were found to be comparable in both final grades and their evaluations of the course (Stack, 2015). One study found that hybrid course sections, which have less classroom instruction time than traditional courses and supplement lectures with online resources, in microeconomics may produce slightly lower tests scores than the traditional course format, but researchers argue that the slight decline in test scores is worth the reduction of financial and time commitments (Joyce et al., 2015). However, another study showed that students in a hybrid format of a physiology course achieve better grades than students in traditional or online formats (Page et al., 2017). Educational outcomes may also be similar for students enrolled in online and residential formats of the same program. Students enrolled in an online format or a traditional format of the same master of social work degree program were found to produce similar grades, competency levels, and satisfaction evaluations upon graduation (Cummings, Chaffin, & Cockerham, 2015).

In addition to the empirical findings that support the effectiveness of online education compared to traditional education, there are also published findings with mixed or negative results. A review of the literature showed that 92% of the reviewed publications concluded that

online education is at least as effective as residential courses while also noting the tendency for research in this area to have selection bias and other methodological limitations that could nullify results (Nguyen, 2015). Research on graduation rates in community college students is inconclusive with some research showing that students who take online courses are more likely to graduate than students who only take residential courses (Shea & Bidjerano, 2014) and other research showing that they are less likely to graduate than their counterparts (Xu & Jaggars, 2013). Employers may be slower than academicians to accept the rise of online education. One study showed that employers across multiple fields favor job candidates who graduated from residential programs over those who graduated from online programs and were otherwise identical in their credentials (Deming, Yuchtman, Abulafi, Goldin, & Katz, 2016). After noting the general ambiguity in results and biases in methodology of research that compares face-to-face and online educational methods, Nguyen (2015) suggested that finding ways to effectively implement online education would be more prudent than continuing to compare the two methodologies as though one is better than the other. The current environment of higher education contains both residential and online courses, which students select based on personal preference and access, so researchers and educators should focus on improving the educational experiences of students in the existing formats.

Online Graduate Education

In an effort to determine the differences in online and face-to-face graduate programs, Cummings and colleagues (2015) compared the educational outcomes of an online format and a traditional format of a master of social work degree program. Graduates from each program over the course of two years were compared, which resulted in a total sample of 345 graduates. They determined that students in the two programs scored similarly on the comprehensive exam,

which assessed their knowledge of core competencies for the field of social work. The average GPA for residential students (3.75) was statistically significantly higher than the average GPA for online students (3.67), but both averages reflected high GPAs. Students in both program formats showed significant increases in self-efficacy for social work, and there were no significant differences in self-efficacy between the two groups at the beginning or end of the program. Online students received statistically significantly higher ratings in seven of the eight social work field competencies and in the overall rating for field competencies. Online students also gave statistically significantly higher satisfaction ratings in their evaluations of their faculty and program. These findings suggest that online master's degree programs may be as effective and satisfactory in training students even in a field that focuses on applied work such as social work.

Undergraduate and graduate students tend to differ in their view of online discussions. When asked to report their experiences with discussion methods in online education, undergraduates tend to evaluate online discussion based on the amount of effort required while graduate students tend to base their evaluations on the depth of the content discussed and the sense of community that was built (Kirby & Hulan, 2016). Because of the different characteristics that undergraduate and graduate students tend to value, different discussion formats may be appropriate for different levels of courses. Undergraduates may prefer the simplicity and ease of text-based discussion boards, and graduate students may prefer the depth of discussion and closer relationships of video or audio discussion posts.

Kirby and Hulan (2016) studied undergraduate and graduate students' opinions of different methods for discussion in an online course. Researchers collected students' written responses to a questionnaire that assessed opinions of standard online discussion boards and

other interaction methods that were more innovative. As one medium for class discussions, students used an online program for discussion and social interaction that gives participants options for methods of participation (e.g., video recordings, audio recordings, text-based posts). Students were asked to write their opinions about the discussion methods that were used and explain their preferences for online discussions. Graduate students wrote that they preferred the interactive discussion method because it allowed them to engage in more meaningful discussions. Undergraduate students wrote that they preferred the standard discussion boards because they were easier to complete.

Online education appears to be an effective method for graduate education (Cummings et al., 2015), and there may be differences in the online discussion preferences of undergraduate and graduate students (Kirby & Hulan, 2016). For online learning to be effective at any level of education, educators must identify and maximize the characteristics that lead to effective learning in online courses.

Course Characteristics that Promote Learning

There is not currently a consensus on an optimal format for online education, but there is research on characteristics that may help promote educational outcomes. To increase the potential for successful outcomes, it is important for course developers to design each aspect of their courses to utilize instructional methods that promote learning (Thompson, Vogler, & Xiu, 2017). Maximizing the potential for personalization and flexibility may enhance student satisfaction with educational experiences (Young, 2006). Finding ways to promote social involvement between students in an online course is important for promoting deep learning (Reese, 2015). Students report that the active engagement of instructors in online courses is a critical aspect of the online learning experience (Gaytan, 2015). In addition to the characteristics

of the learning environment, the characteristics of the learner are very important for successful learning outcomes. To be successful in online courses, students must possess the self-discipline and time-management skills to complete assignments independently (Broadbent & Poon, 2015).

Flexibility. An advantage of online education is that it is characteristically flexible and can be modified to meet the needs of individual students (Willcox et al., 2016). Some students select online courses because they cannot accommodate the restrictions of residential courses into their lives, and educators should capitalize on this advantage of online education as they design their courses. Flexibility in the delivery of an online course is strongly related to students' satisfaction with their experiences (Young, 2006). To increase flexibility and optimize learning opportunities, online educators can offer optional resources and activities to students who need more scaffolding in order to meet the demands of a course (Willcox et al., 2016). By facilitating growth in a manner that is individualized to each student, teachers can help students rise to the standards of the course rather than lowering standards to accommodate students. In addition to online courses, flexibility is also important for academic programs. When the timing and course of academic requirements are flexible to meet the needs of students, they are empowered and take responsibility for achieving the necessary requirements (Berge, 2002).

Social engagement. Finding ways to engage students in social interactions can help promote learning. Critics of online education argue that the key to quality in education is social interaction, and they posit that social interaction tends to be inferior or nonexistent in an online setting (Reese, 2015). Experienced online instructors also believe that social involvement helps facilitate student learning in online courses (Lewis & Abdul-Hamid, 2006). If social involvement is important for student learning (Reese, 2015) and schools continue to offer online courses regardless of the concerns of critics (Nguyen, 2015), course developers must find ways of

including social engagement in online courses to ensure the quality of online education. Technological advances in recent decades have made it possible for students and instructors to have meaningful social interactions in online courses, but there is not yet an agreed-upon method for optimal social engagement (Sun & Chen, 2016).

There are many ways to encourage social engagement in online courses, and it may be helpful to incorporate a variety of methods into each course to enhance the potential for social interaction (Reese, 2015). When asked about strategies for promoting social engagement in online courses, experienced online teachers suggested that beginning the course by asking students to post introductions of themselves on discussion boards can help start the development of an atmosphere of collaboration that becomes deeper and more meaningful over time (Lewis & Abdul-Hamid, 2006). Instructors also suggest maintaining active discussions throughout the course, incorporating a variety of topics, and having both formal content-based discussions and informal opinion-based discussions to promote different levels of social engagement.

Group assignments, which are completed with a team of classmates, are another way of promoting interaction. Focus groups of online faculty members revealed that online professors believe group projects are important for learning and social interaction in online courses (Morgan, Williams, Cameron, & Wade, 2014). Group projects require students to build collaborative relationships with each other and work toward shared goals. Having students complete assignments in teams may help foster collaborative learning and promote social interactions (Berge, 2002). Instructors can facilitate group projects by creating discussion boards devoted to each group and grading participation based on how students behave in those discussion boards (Lewis & Abdul-Hamid, 2006). When instructors make contributions to group

discussions and monitor the participation of group members, they can help assuage the stress that group projects produce in many students.

Instructor involvement. It is important for instructors to be actively involved in online courses. Students in online courses report that they believe it is important to have instructors who are actively and consistently involved in courses, which may involve posting videos, lectures, or other materials that present the instructor teaching the course material (Gaytan, 2015). Instructors of online courses should be in a continuous intellectual dialogue with students to model cognitive engagement with the subject matter, reinforce learning, and inspire more scholarly thinking and writing (Berge, 2002). Students in online courses believe that interaction with their instructors is important for their learning (Page et al., 2017), and their belief is evidenced by their tendency to rate instructors as more effective when instructors are perceived as being more socially involved with students (Young, 2006). Instructors should remember that their interactions with students set the tone for the whole course, and they have the power to incite a passion for learning or damper student motivation with their communication (Lewis & Abdul-Hamid, 2006).

Thoughtful and thorough corrective evaluation is an important part of education. Students in online courses report that detailed feedback on assignments helps them to gain understanding and grow in their knowledge (Gaytan, 2015). Comprehensive feedback allows students to correct mistakes and improve their performance in the future, which are both important for learning. Instructors should work to provide clear instructions and expectations for each assignment so that students can accurately demonstrate their knowledge and understanding of the subject matter (Lewis & Abdul-Hamid, 2006). Evaluation of assignments gives students feedback on their level of understanding (Berge, 2002), and students report that explanatory feedback on graded work is

more important than speed of grading because feedback is needed to help improve future assignments (Gaytan, 2015).

Young (2006) found that 86.2% of the variance in how students rated the effectiveness of online instructors was accounted for by how students rated instructors on seven variables, which are being adaptable to meet the needs of students, presenting meaningful examples to explain concepts, inspiring students to work hard, effective course facilitation, perceived value of course content, clear communication, and concern for student learning. Young also argued that students are most satisfied with their education when they feel supported and genuinely cared for by teachers, when teachers find a balance between clear class expectations and flexibly meeting the needs of students, and when teachers seem to be invested in the education of each student. Even though they may never interact face-to-face, students need to believe that they are socially connected to teachers.

Learner Characteristics that Promote Learning

For students to successfully learn in online courses, they need to have the self-discipline to independently meet the course requirements and the ability to cognitively engage the course material. When students are offered quality online courses, they need to take the initiative to engage the learning process and get the most out of their education (Kauffman, 2015). Students who choose to spend more time interacting with optional online course material and studying tend to receive higher grades (Page et al., 2017), and those who demonstrate good time management skills and the ability to prioritize important tasks tend to perform better in online courses (Broadbent & Poon, 2015). Students who are enrolled in interactive online courses and choose to engage the learning process tend to earn higher grades and rate their experiences as more satisfying (Zhang, 2005). Conversely, students who do not have the self-discipline to

complete coursework autonomously are less likely to succeed in online courses (Kauffman, 2015). Students with the tendency to think critically about ideas are also more likely to be able to meet the demands of online education.

The research reported in the above paragraph includes a literature review (Kauffman, 2015), two research studies (Page et al., 2017; Zhang, 2005), and a meta-analysis (Broadbent & Poon, 2015); it is important to understand the characteristics of these publications in order to assess their applicability to the present state of online education. In a review of the literature, Kauffman (2015) provided a summary of the literature on this subject with some suggestions and implications based on the current state of research. In the first research study, Page and colleagues (2017) conducted cross-sectional research on students enrolled in an introductory physiology course designed for first-year college students. Between 2012 and 2014, this course underwent fundamental design changes as it transitioned from a traditional residential course to a blended course, and finally, to an online course. They measured course outcomes by grades and by surveying the opinions of their 1,360 participants. While there were many course design variables that were adjusted simultaneously (e.g., lecture time, worksheets, assignments, and test content), which makes it impossible to determine which specific elements contributed to changes, their reported findings seem to reflect the general changes that occur during a transition from face-to-face to online educational environments.

In the research study mentioned above, Zhang (2005) randomly assigned students to one of three conditions (i.e., traditional classroom, online presentation of recorded lectures and notes, and an interactive online presentation of lectures and course materials that allowed students to modify the presentation to fit their preferences) for learning algebra and measured learning and student satisfaction to compare the three conditions. The results showed that learning and

satisfaction were highest in the interactive online course, but there are also some limitations on how applicable these findings are to current online learning. First, the research was published in 2005, and online educational methods have changed greatly since that time. Second, the students in the two online formats were required to complete coursework in a campus computer lab, which is tremendously different from most current online coursework that allows students to complete assignments whenever and wherever is most convenient.

A meta-analysis by Broadbent and Poon (2015) of research on important factors in online education showed that the ability to concentrate, use metacognition, regulate effort, and demonstrate critical thinking skills were highly predictive of positive academic outcomes. To conduct this meta-analysis, researchers found articles that met search criteria relevant to self-regulated learning strategies in college students, included a statistic that showed the correlation between the self-regulated learning strategy and a measure of learning, and were published between 2004 and 2014. Effect sizes for each identified self-regulated learning strategy were converted to be comparable and averaged for comparison with other strategies. The results showed that learner characteristics are important for the successful completion of online education.

Conclusion

Online education is ubiquitous and appears to be here to stay in higher education (Allen & Seaman, 2016). There is research testing the effectiveness of online education; however, if online education is going to be a part of higher education, the focus of researchers and educators should be on how to make it effective instead of on comparing it to traditional educational methods (Nguyen, 2015). Important considerations for enhancing the quality of online education include flexibility and personalization (Young, 2006), social involvement in students (Reese,

2015), instructor engagement (Gaytan, 2015), and students' abilities to autonomously handle the requirements of online learning environments (Broadbent & Poon, 2015). In order to pursue excellence in online higher education, it is important to identify important factors and organize information into a unified theoretical framework. The CoI framework is a model of online education that emphasizes the roles of cognitive presence, social presence, and teaching presence in online learning environments (Garrison et al., 1999). The CoI model is helpful to educators as they seek to design and implement effective online educational methods.

Community of Inquiry (CoI)

The growth of technology and the internet has changed learning and triggered a need for the evolution of instructional methods. With an overwhelming abundance of information available on the internet, students need guidance on how to be consumers of knowledge (Garrison & Anderson, 2003). In online learning, much of the control of learning falls onto the students, but educators still have some important influence. Educators have the challenge of infusing into online learning environments the factors of traditional education that foster student learning (Garrison, 1997). It has long been accepted by educators and researchers that the critical thinking skills that characterize higher education can only be developed in an environment that involves reflective and informed discourse among members of the learning community (Garrison & Anderson, 2003). Some critics of online education argue that the social component of education is necessary for learning and that educators need to figure out how to have meaningful social interactions for deep learning to occur (Reese, 2015). Computer-mediated communication enables the existence of an online community with critical and reflective discussion of ideas (Garrison & Anderson, 1999). The CoI framework was applied to online learning to help guide educators in the development of a quality online learning environment, which involves the

cultivation of cognitive presence, social presence, and teaching presence (Garrison & Anderson, 2003).

The CoI model consists of three overlapping, yet characteristically distinct, presences (i.e., cognitive presence, social presence, and teaching presence) that form the essential elements of an effective learning environment (Garrison et al., 1999). The three presences are essential parts of face-to-face learning environments and are thought to be necessary to promote deep and meaningful understanding. These presences are not a natural part of text-based learning, so teachers need to find ways to infuse the three presences into online courses. Cognitive presence, social presence, and teaching presence are three separate factors that influence each other and have a joint benefit on learning outcomes (Garrison & Anderson, 2003). Cognitive presence is the fundamental component of learning; it is the process of gaining an understanding of the meaning of ideas (Garrison et al., 1999). Social presence deepens learning as students engage in reflective dialogue and respond to each other's ideas (Rourke, Anderson, Garrison, & Archer, 1999). Teaching presence facilitates the learning process and directs attention toward crucial subjects (Anderson et al., 2001). Both face-to-face and online learning environments must have each of the three presences to be successful, and stronger presences promote deeper and more meaningful learning (Garrison et al., 1999). As instructional methods change over time, it is important for teachers to reevaluate the learning environment to ensure that they are incorporating the three presences in the maximum capacity for the medium that is used (Garrison & Anderson, 2003).

Cognitive Presence

Cognitive presence is intellectual engagement and meaning construction, which is the most essential element of learning in higher education (Garrison et al., 1999). Because the

critical thinking that characterizes learning in higher education requires students to engage the subject matter, a strong cognitive presence is needed to facilitate deep and meaningful learning (Garrison & Anderson, 2003). Students need to learn information then consider and respond to the information in a critical and reflective manner. Higher levels of cognitive presence are highly related to students' ratings of course satisfaction and learning (Akyol & Garrison, 2008). When the cognitive presence of an online course is higher, as measured by qualitative analysis of depth of thought demonstrated in discussion board posts, students have higher perceived and actual learning outcomes (Akyol & Garrison, 2011). Cognitive presence in online courses is also strongly predictive of student retention in academic programs (Boston et al., 2009).

Phases of cognitive presence. According to Garrison and colleagues (1999), there are four phases of cognitive development, which are the triggering event, exploration, integration, and resolution. The triggering event is students' first interaction with some idea, and it may occur purposefully when teacher or student intentionally brings something to the attention of the class or accidentally when someone has a thought or question about an uncertainty (Garrison, Anderson, & Archer, 2001). In the exploration phase, students must gain a full understanding of the dilemma and decide what informational sources will be helpful for solving the dilemma (Garrison et al., 1999). Within a learning community, the exploration phase involves some intrapsychic reflective thought interspersed with critical dialogue. Discussing ideas with fellow learners helps students gain a broader perspective and a deeper understanding (Garrison et al., 2001). During the third phase, integration, students start to brainstorm about solutions and continue to reflect on their personal ideas while also responding to the ideas of classmates (Garrison et al., 1999). The integration phase requires the teacher to guide discussions to ensure that students continue the critical thinking process through to the end without settling on

premature conclusions (Garrison et al., 2001). The final stage is resolution, which involves agreeing upon a consensual resolution to the problem and discussing applications of the resolution (Garrison et al., 1999). In this final stage, the teacher has the role of challenging the resolution by applying scrutiny and proposing questions and alternative ways of thinking (Garrison et al., 2001). The ultimate solution must meet critical thinking standards and be congruent with what the teacher already knows about the subject.

Even though the four phases of cognitive presence are specifically related to cognitive presence, the importance of social presence and teaching presence in these phases is clear throughout the process which highlights the interconnection of the three CoI presences (Garrison et al., 1999). The triggering event usually involves some aspect of the social presence because questions are posed either by the teacher or by fellow classmates to the discussion forum. During the exploration phase, students discuss ideas and brainstorm about relevant information (Garrison et al., 2001). They gain more understanding of the dilemma by hearing the perspectives of classmates. Students continue to discuss ideas and respond to the comments of classmates during the integration phase. They have to be able to start discussing a solution in a collaborative manner, which involves using critical thinking skills to state and support their perspectives (Garrison et al., 1999). In the resolution phase, students must test their agreed upon solution using the standard of logical thinking to ensure that the solution can adequately solve the dilemma, and they discuss applications of the solution within the context of the course content (Garrison et al., 2001).

Similar to the social presence, the teaching presence is also an essential part of the phases of cognitive presence (Garrison et al., 1999). The teaching presence is important when a question is posed because it is the teacher's responsibility to direct the class's attention to relevant

content, which may involve directly asking a question or indirectly facilitating discussion as students ask questions (Garrison et al., 2001). The teacher should be involved in the triggering event to help students understand the meaningfulness of the topic. As the students reflect and discuss the dilemma during the exploration phase, the teacher should guide them as they attempt to evaluate relevant information (Garrison et al., 1999). Teachers should know more about the subject matter and have a greater understanding of the dilemma in their field of study so they can guide and correct students as discussion continues. Instructors' role in the transition into the integration phase is critical because students have the tendency to either continue the discussion of the exploration stage or skip the integration phase in favor of a premature solution (Garrison et al., 2001). Teachers must model the ability to focus in on pertinent information to move into the integration phase and the ability to critically evaluate different options to avoid jumping to the resolution phase. In the resolution phase, instructors must guide the class to a logical solution that is congruent with the teacher's knowledge of the subject and challenge the class by asking questions to test the logic of the solution (Garrison et al., 1999).

Facilitating cognitive presence. Cognitive presence involves deep consideration of the content and can be facilitated by learning activities that promote cognitive engagement (Garrison et al., 1999). Discussion boards may be used to promote cognitive presence through the social dialogue, but the level of cognitive presence depends on students' method of engaging the discussion boards. Vogler and colleagues (2013) found that students tend to complete discussion board assignments using different strategies, which range from meeting the minimum requirements for the assignment while minimizing cognitive engagement to actively engaging the discussion while thinking and reflecting upon the content. Students who only seek to meet the minimum requirements tend to start writing before they fully form their opinions, construct

posts as they read classmates' comments, do not revise writing before posting it, and have the least amount of cognitive presence. In contrast, students who choose to fully engage the discussion board process tend to start writing only after they have formed their initial ideas, revise their thoughts after reading the ideas of other students, consult outside literature for clarification, and have a strong cognitive presence. Participation styles tend to be fluid with students shifting between styles as they engage in different discussions.

Requiring students to submit video or audio recordings may help promote cognitive presence because they require students to engage the educational material in a different way (Thompson et al., 2017). In online courses that tend to rely heavily on readings, recordings may reengage the attention of students and help avoid passive complacency. Students report that when they are required to record their thoughts and reflective content, they are more likely to think more deeply about the subject matter because they need to produce a script, rehearse their statements, and deliver a performance that will be viewed by classmates (Kirby & Hulan, 2016). Having to record their thoughts in video or audio format causes the students to approach their discussion contributions in a more serious manner and reevaluate their opinions until they are confident enough to verbalize them in front of others. Instead of posting the first draft of their initial reactions to a discussion board, they revise their thoughts into a reflective and cohesive final product.

Social Presence

Social presence is the ability of members of a learning community to have genuine and meaningful social interactions (Garrison et al., 1999). A learning environment with a strong social presence is permeated by the personal characteristics of its members (i.e., teachers and students). Individuals bring their unique personalities, experiences, education, and perspectives

into the learning environment. Each learning environment is as unique as the makeup of its members, and it is important that members bring their authentic selves into the learning environment (Rourke et al., 1999). The ability of students and teachers to present themselves in an authentic way may be inhibited by using an online medium, which is less conducive of genuine natural interactions than a traditional classroom (Reese, 2015). Social presence takes a supportive role of cognitive presence because critical thinking, intellectual engagement, and the finding of meaning are continuously engaged while conversing with and considering the perspectives of fellow learners (Garrison et al., 1999).

Social presence also accomplishes the secondary role of promoting emotional connectedness among students, which increases the level of commitment to the course and the academic program (Garrison et al., 1999). Social presence has been shown to be a significant positive predictor of the retention of online students, and it is a stronger predictor of student retention than either of the other two presences (Boston et al., 2009). When students feel emotionally involved with classmates and teachers, they have a sense of belonging and feel supported (Garrison et al., 1999). Even though they may be separated by many miles, students can feel that they are a part of the community of their school by having a strong social presence. For members of the learning community to become personally engaged, there has to be a strong social presence so instructors should try to maximize social engagement between students and with teachers (Garrison & Anderson, 2003).

Strong social presence is important for learning because it allows the learner to feel fully emerged in the learning process as a member of a learning community (Armellini & De Stefani, 2016). Students in online academic programs who feel strong social connectedness with faculty and other students tend to be more satisfied in their education and have greater levels of

academic persistence (Rovai, 2002). One study showed that 60% of the variance in learning satisfaction is accounted for by social presence (Gunawardena & Zittle, 1997). Other researchers suggest that social presence is so important that it is the fundamental CoI presence and that the other two presences both require social presence and are infused by social presence (Armellini & De Stefani, 2016). Social presence is highly correlated with students' perceptions of learning outcomes and satisfaction with learning experiences (Kim, Song, & Luo, 2016). A meta-analysis examining published research studies found that students' rating of learning and their satisfaction is consistently found to be correlated with social presence (Richardson, Maeda, Lv, & Caskurlu, 2017).

Categories of social presence. There are three categories of communication within social presence that researchers use as they analyze transcripts of class interactions to determine the amount of social presence (Garrison et al., 1999). Affective (also called emotional expression), interactive (also called open communication), and cohesive (also called group cohesion) are the names of the three types of social presence (Rourke et al., 1999). Affective content is anything that involves emotional expression or personal disclosure (Garrison et al., 1999). Interactive content involves communication that is collaborative and responsive to other members of the learning community (Rourke et al., 1999). Cohesive content consists of communication that builds unity within a group, which may involve using social niceties or the simple acknowledgment by a group member of the existence of a shared experience or goal (Garrison et al., 1999). During a social learning interaction, group members use varying amounts of each type of social presence to build unity with other members (Armellini & De Stefani, 2016).

Communication in the affective category of social presence expresses the personal or emotional experiences of the learner in an attempt to build comradery through self-disclosure (Garrison et al., 1999). In face-to-face interactions, affective expression happens naturally, but it takes more effort to express emotion in a text-based learning environment where it is difficult to perceive the tones and facial expressions of fellow learners (Rourke et al., 1999). Examples of affective comments are students relating the material to their personal lives and sharing examples from their own experiences (Armellini & De Stefani, 2016). Any emotional responses, such as expressions of surprise or confusion, are also affective comments because they are intended to communicate the emotional state of an individual. Even the use of emoticons has been shown to enhance text-based emotional expression (Gunawardena & Zittle, 1997). Affective statements help demonstrate the unique personalities and experiences of members of a community of inquiry and help students build confidence that they know and understand the authentic persons of their classmates and teacher (Garrison et al., 1999).

Messages that are responding to the comments of others are in the interactive category of social communication (Rourke et al., 1999). As students discuss ideas and converse with each other, it is natural to reference and respond to previous statements. In a text-based environment, interactive communications may occur in response to an initial discussion prompt from the instructor or in response to specific comments of other students (Garrison et al., 1999). Students may state agreement or disagreement with a previous comment, or they may ask for more clarification on a previous comment (Armellini & De Stefani, 2016). When students reference the statements of another group member, they are turning the attention of the group onto the contribution of one member and adding a sense of united agreement within the group (Garrison et al., 1999). Because positive tones and physical expressions are absent in a text-based learning

environment, it is important for learners to state written affirmations of each other to express understanding and agreement (Rourke et al., 1999). The purpose of interactive communication is to strengthen the cohesion of the group and build feelings of a shared learning experience among learners (Garrison et al., 1999).

The cohesive category is present in comments that emphasize the unity of members or comments that meet a social responsibility for members of a group (e.g., greetings; Garrison et al., 1999). One basic requirement for any community of inquiry is that it consists of a *community*. Communication in the cohesion category is what turns separate individuals into a learning community with members who feel bonded by shared goals and experiences (Armellini & De Stefani, 2016). For people to feel united as a group, they must engage in communication that meets the societal expectations for group members (e.g., being kind to each other; Garrison et al., 1999). Examples of cohesive communication are greeting each other, using phatic statements, or any reference to the group as a united entity (Armellini & De Stefani, 2016). Phatic statements, which are polite but unnecessary statements (e.g., hello, good morning, have a nice day, talk to you later), serve an important function in text-based communication because they portray writers as authentic people and promote positive feelings (Rourke et al., 1999). Vocative statements, which occur when group member address each other by name in their dialogue, help build feelings of belongingness (Garrison et al., 1999). Using inclusive pronouns (e.g., we, us, or our) to refer to the group promotes a sense of unity and helps to bond the group together (Rourke et al., 1999).

Facilitating social presence. Social presence is encouraged any time students collaboratively engage the course material (Armellini & De Stefani, 2016). Using some creativity, instructors can incorporate social presence into activities that are already present in a

course. For example, instructors who use video or audio recordings may have students engage in reflective discussions with each other about the recordings to promote social interaction and deeper processing (Thompson et al., 2017). Teachers may choose to have students engage in text-based or video discussions. Graduate students report that using video recording as a method for engaging in asynchronous discussions with classmates, instead of text-based discussion board posts, helps to build deeper relationships and increase the quality of learning (Kirby & Hulan, 2016). Requiring students to post recordings of themselves discussing their thoughts and responding to the videos of other students may help build a sense of community among them and help students recognize their classmates as real people (Cummins & Gouripeddi, 2015). Because community with colleagues and learning quality are important factors for graduate students when they evaluate discussion formats in online courses, graduate students may prefer video discussion post even though they require more time and effort than text-based discussion formats (Kirby & Hulan, 2016).

Text-based discussion boards are also an option for promoting social presence, but teachers may need to be creative to avoid having students do the minimum to meet the course requirements while not truly engaging other students. If students fully engage the discussion process, discussion boards can be an effective learning tool, but there is great variability in the amount of engagement that students exhibit in online discussion boards (Vogler et al., 2013). Instructors have the challenge of designing assignments that promote deep social and cognitive engagements while impeding students' tendency to exert the less amount of effort required by the assignment instructions. One option for text-based online discussion is to have students engage in a real-time discussion that involves all members of the class interacting with each other and responding to each other at the same time (Thompson et al., 2017). Because

synchronous discussions can become fast-paced, students tend to become more engaged with each other and ideas. Synchronous text-based discussions may also allow more group members to actively participate than would be feasible in a face-to-face environment (Benshoff & Gibbons, 2011). However, the fast-paced nature of synchronous discussions may reduce the number of reflective thoughts before posts and may cause some students stress if they struggle to keep up with the pace of other students (Thompson et al., 2017).

Teaching Presence

Teaching presence is the function of the teacher to guide and facilitate learning experiences (Garrison et al., 1999). In online learning, students have strong autonomy and responsibility in their learning, and teachers take on the roles of guides and facilitators (Garrison & Anderson, 2003). However, the role of a teacher is still vitally important as students learn and explore new intellectual concepts. Teaching presence consists of three categories of tasks that teachers must maintain, which are instructional design, facilitating discourse, and direct instruction (Anderson et al., 2001). In a learning environment with a strong teaching presence, teachers serve as the learning administrator, the expert guide, and a fellow member of the learning community.

While teaching presence is not considered to be as fundamental to learning as cognitive presence, it is thought to play a vitally important role in establishing and maintaining the other two presences (Garrison et al., 1999). Garrison, Cleveland-Innes, and Fung (2010) suggest that a strong teaching presence can help facilitate social presence and cognitive presence. Teachers promote cognitive presence through modeling critical thinking for students by posting thoughtful, reflective, and informed comments into the class discussions. When teachers are

actively involved in the class and interacting with students, they encourage further interaction of students, which is crucial for social presence (Anderson et al., 2001).

Categories of teaching presence. Teaching presence is made up of three separate categories of behaviors, which are instructional design, facilitating discourse, and direct instruction (Anderson et al., 2001). Instructional design (also called instructional management) is defined by the teacher's ability to manage the logistics of online education including setting up the course in the online medium, planning the course schedule, and organizing learning activities (Garrison et al., 1999). Facilitating discourse (also called building understanding) consists of teachers' roles in facilitating discussion and shaping ideas (Anderson et al., 2001). Direct instruction is the aspect of teaching that involves knowledge contribution from the teacher, which may take the form of recorded lectures, written comments, or constructive feedback on assignments (Garrison et al., 1999).

The instructional design category of teaching presence encapsulates all of the teaching activities that relate to managing the course (Garrison et al., 1999). Teachers determine the curriculum and communicate details to the students about expectations (Anderson et al., 2001). They select and facilitate activities and assignments. They establish norms for communication and etiquette for discussions, which includes the level of professionalism that is expected of students (Anderson et al., 2001). This category of teaching presence requires administrative and organizational skills (Garrison et al., 1999). With the online format requiring pre-course organization and planning, this category of teaching presence involves all of the preparation necessary to ensure that classes run smoothly throughout the length of the course (Anderson et al., 2001).

The facilitating discourse category of teaching presence includes activities that promote group interactions and social investment (Garrison et al., 1999). As students interact in an online forum, there needs to be an actively engaged teacher to make connections between comments and use the statements of students to help guide the discussion into a deeper place (Anderson et al., 2001). Teachers draw attention to the posts of students and ask questions to build understanding. While students engage in the process of dialoguing about course content, teachers take the role of a group facilitator who monitors, reflects, and guides discussion (Garrison, 2007). Teachers should seek to bring attention to similarities and differences among students' comments to help students gain the skill of discriminating between ideas (Garrison et al., 1999). They should also monitor the activities of each member of the group and attempt to prompt participation from minimally involved members (Anderson et al., 2001).

The direct instruction category of teaching presence is the aspect of the teaching role that involves the presentation of knowledge from the teacher to the students (Garrison et al., 1999). Direct instruction may involve recordings of lectures, informative written posts, or corrective feedback. It involves some type of discourse from the instructor to convey knowledge or expertise (Garrison, 2007). In an online format, direct instruction must take a different form than face-to-face instruction. Teachers often use the medium of text-based discussions to add thoughts and direct students to outside resources to supplement knowledge (Anderson et al., 2001). The subtle differences between direct instruction and facilitating discourse may be difficult to distinguish at times, but direct instruction is distinct in its inclusion of some contribution of knowledge or expertise originating from the instructor (Garrison, 2007).

Facilitating teaching presence. Establishing a strong teaching presence in online education can be a challenge because teachers are physically separated from their students, but

there are some strategies that have been shown to promote teaching presence online. Different students tend to prefer different methods so incorporating a combination of video, audio, and text-based interactions may help support a wide range of students (Dringus, Snyder, & Terrell, 2010). Teachers may use video recordings to help students perceive instructors as real people who are actively involved in the educational process (Thompson et al., 2017). To further encourage teaching presence, teachers may engage in discussions with students about the content of recordings after students view recordings. Using audio recordings has also been shown to increase student perceptions of teaching presence by helping them to view the instructor as personally engaged and by providing additional clarification of the course content (Dringus et al., 2010).

Teaching presence can be established by modeling appropriate scholarly behaviors for students, which can be done in many formats. Teachers promote and model collaborative interaction through synchronous test-based discussions with students in online classes, which involve having the whole class involved at the same time in a text-based discussion of a topic (Thompson et al., 2017). Synchronous text-based discussions may be advantageous to video or face-to-face discussions because they allow multiple students to post and respond without waiting and students have the opportunity to edit their writing before they post it, which encourages deeper reflection than unedited speech. They also allow for more students to participate simultaneously without the learning environment disintegrating into chaos as a face-to-face classroom would with too many simultaneous contributors (Benshoff & Gibbons, 2011).

Relationships Between Presences

In the CoI framework, the presences are three variables that are characteristically distinct yet highly entangled and indivisible (Garrison et al., 1999). Research on the CoI framework

reveals that the three presences are highly correlated with each other (Kozan & Richardson, 2014), which supports the notion that they are reliant on each other. As an academic course progresses, the CoI presences mature as the critical thinking and relationships mature (Akyol & Garrison, 2008). The three presences remain highly correlated as they grow deeper over time. When comparing the three presences over time, Shea and colleagues (2010) found that increases in instructors' teaching presence tend to lead to increases in social presence in the course. If instructors are exerting good leadership skills and facilitating the course with a strong teaching presence, students tend to follow the example of the teacher and become socially engaged. Likewise, when teachers show low levels of teaching presence, social presence is subsequently low as students follow the teacher's example.

Garrison and colleagues (2010) suggest that there is a causal relationship between the presences with teaching presence having an effect on social presence and both teaching presence and social presence having an effect on cognitive presence. They argue that teaching presence is important for the initial establishment of all three of the CoI presences, that social presence helps to promote a strong cognitive presence, and that teaching presence has both a direct effect on cognitive presence and an indirect effect on cognitive presence through its effect on social presence. Their research is congruent with Garrison and colleagues (1999) original claim that cognitive presence is the fundamental element for learning and the other two presences support the cognitive presence.

Model Updates

Learning presence. Shea and colleagues (2012) suggest that learning presence should be added to the model as a fourth presence to account for the role of the learner in the educational process. Because online learning has long been considered a self-directed process and many

aspects of online learning are truly self-directed by students, Shea and colleagues suggest that the CoI model would be a more accurate model of online learning if it included an explanation of the learner's involvement. Shea and colleagues (2014) further explored the concept of learning presence, and they concluded that learning presence would be a useful addition to the CoI model because it accounts for many activities of the learner that cannot be fulfilled by the teacher or other students.

Social presence as central. Armellini and De Stefani (2016) propose that social presence is the fundamental presence in CoI and that the other two presences are facilitated through social presence. They argue that social presence must exist before any cognitive presence or teaching presence can develop. Because of technological advances and changes in how people communicate, the social aspect of an online learning environment has become more pervasive throughout all three presences. It is possible that online learning no longer contains a pure cognitive presence, a pure teaching presence, and a pure social presence that are distinct from, yet influence, each other. Instead, the cognitive presence and the teaching presence have been profoundly infused with social elements.

Measurement

After a review of CoI literature (Garrison & Arbaugh, 2007) that demonstrated the need for an objective measure of the CoI framework in online courses, Arbaugh and colleagues (2008) developed a questionnaire, the Community of Inquiry Framework Survey Instrument, to assess the cognitive presence, social presence, and teaching presence of individual online academic courses. The Community of Inquiry Framework Survey Instrument is a 34-item measure with Likert scale responses of 0 (*Strongly Disagree*) to 4 (*Strongly Agree*). Researchers used a Principal Components Analysis to assess the instrument, which supported the presence of a

three-factor model. The Cronbach's Alphas showed strong internal consistency for the cognitive presence factor ($\alpha = 0.95$), the social presence factor ($\alpha = 0.91$), and the teaching presence factor ($\alpha = 0.94$).

Since its publication, the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) has been validated and used in multiple studies. In a review of the literature, Stenbom (2018) demonstrated its ubiquity and usefulness in research about the CoI framework since its publication. Bangert (2009) performed an exploratory factor analysis that revealed a three-factor model and then performed a confirmatory factor analysis that confirmed the fit of the three-factor model. These results were consistent with Arbaugh and colleagues' (2008) original conceptualization and further confirmed the validity of the scale. The Community of Inquiry Framework Survey Instrument has been used to demonstrate the relationships between the three presences and test hypotheses about the possible causal relationships among the three presences (Archibald, 2010; Garrison et al., 2010).

While this scale by Arbaugh and colleagues (2008) is useful for assessing student perceptions of the three CoI domains in individual online classes (Stenbom, 2018), there is still a need for a measure for evaluating student perceptions of the presence of the three CoI domains within an online educational program (Kumar et al., 2011). Kumar and colleagues (2011) designed the structure of an online doctoral program to enhance the CoI presences, and they modified the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) to measure the three CoI presences of their online program including questions pertaining to the specific format of their program. There is still a need for a valid and reliable instrument to measure the three CoI presences of programs that is nonspecific enough to be used by any online program.

Conclusion

The CoI framework is a model of online education that emphasizes the need for strong cognitive, social, and teaching presences in educational environments for effective learning to occur (Garrison et al., 1999). The cognitive presence involves active intellectual engagement with the learning material (Garrison et al., 1999) and is supported by the social presence and teaching presence (Garrison et al., 2010). The social presence consists of any type of social engagement (Rourke et al., 1999), and it is fostered by collaborative work and interactive discussions (Armellini & De Stefani, 2016). The teaching presence is made up of and supported by the lectures, guidance, and class structure that the instructors provide (Anderson et al., 2001). To measure the three CoI presences in courses, Arbaugh and colleagues (2008) developed the Community of Inquiry Framework Survey Instrument. Kumar and colleagues (2011) modified the course-level scale to fit the design of their doctoral program, but there is still a need for a validated measure to assess the CoI in non-specific online programs (Kumar & Ritzhaupt, 2014).

Measures for Evaluating Learning Environments

There is a need for an instrument that can measure the CoI presences in online academic programs (Kumar et al., 2011). While there are some measures that are designed to assess academic learning environments, there are no measures that sufficiently assess online programs from a CoI perspective. Two measures that are relevant to this topic are the National Survey of Student Engagement (NSSE) and Kumar and colleagues' (2011) adaptation of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008). The NSSE is a current and useful method for evaluating social environments in higher education (Center for Postsecondary Research, n.d.c). While it measures the level of social engagement at colleges and universities, it is not designed to measure specific academic programs and it does not attempt to measure the

teaching or cognitive presences of the CoI. Kumar and colleagues' (2011) adaptation of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) was designed to measure the CoI presences in a manner that was specific to the academic program of the authors. This measure is not sufficient to measure other online academic programs, and it lacks sufficient data to demonstrate its validity and reliability. While neither of these instruments is sufficient to assess CoI presences in diverse online programs, they are both important to understand due to their relevance to the present topic of research.

National Survey of Student Engagement (NSSE)

The NSSE, an instrument designed to measure the level of student involvement in colleges and universities (Center for Postsecondary Research, n.d.a), was designed with the assumption that greater student involvement promotes higher quality learning (Center for Postsecondary Research, n.d.c). It is administered to an entire school, and the results can be separated into programs to determine the level of student engagement within specific academic programs. The NSSE measures four general themes of student engagement (i.e., academic challenge, learning with peers, experiences with faculty, and campus environment), which are each made up of subcategories called engagement indicators (Center for Postsecondary Research, n.d.b). It also measures six high-impact practices, which are practices that are theorized to lead to long-lasting and meaningful changes in students' lives (i.e., service-learning, learning community, research with faculty, internship or field experience, study abroad, and culminating senior experience). The NSSE is designed to help colleges and universities assess their social environments and identify areas of needed improvement (Center for Postsecondary Research, n.d.c). It has been updated several times since its introduction in 2001, and it has been used as a measure of student engagement in numerous research studies.

Research has shown that the NSSE is a useful tool for assessing student engagement. Kuh (2001) argued that the NSSE is a valuable tool because it is a unique and innovative method of assessing student engagement. The NSSE is innovative because of its use of student engagement as a method for assessing the quality of the educational environment, which deviates from the typical methods that are restricted to student satisfaction and correlations with achievement scores (Kuh, 2009). Its usefulness is demonstrated by the variety of research that has employed it to measure student engagement. The results of the NSSE has been shown to be predictive of college student GPA (Fuller, Wilson, & Tobin, 2011). The NSSE has been useful in demonstrating the relationship between student engagement and academic achievement (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). It has also been used in research that demonstrated the role of social engagement and purposeful volunteer programs in the character development of college students (Kuh, & Umbach, 2004). The NSSE has a unique status as an instrument to measure student engagement in colleges and universities.

There are a few limitations to using the NSSE to measure the CoI in academic programs. First, the NSSE is a useful tool for measuring social engagement in colleges and universities (Kuh, 2001), but it is not specifically designed to evaluate academic programs within schools. Second, if academicians are interested in measuring the CoI presences, the NSSE is not designed to measure all three presences. While there are some similarities between the NSSE construct of student engagement (Center for Postsecondary Research, n.d.c) and the CoI construct of social presence (Garrison et al., 1999), the NSSE does not measure cognitive presence or teaching presence. The NSSE is a useful measure, but it is not a sufficient tool for measuring the CoI in academic programs. There is a need for a measure that can sufficiently evaluate the CoI in academic programs (Kumar et al., 2011).

Measuring the CoI in Online Academic Programs

Arbaugh and colleagues (2008) developed the Community of Inquiry Framework Survey Instrument, which is a measure for assessing the CoI in academic courses. After the development of the Community of Inquiry Framework Survey Instrument, researchers (Kumar et al., 2011) identified the need for an instrument to measure the CoI presences in academic programs. Kumar and colleagues (2011) attempted to remedy the need for a measure by modifying the Community of Inquiry Framework Survey Instrument to measure the CoI of their online doctoral program. The resulting measure contained some general items and some items that were specific to the program it was designed to assess.

Kumar and colleagues (2011) added questions, deleted items, and modified the questions of the Community of Inquiry Framework Survey Instrument by Arbaugh and colleagues (2008) to create an instrument that would measure the CoI of their online doctorate in educational technology program. Their survey has three subscales (i.e., Faculty Instruction and Feedback; Support, Learning Environments, and Community-Building; and Application of Learning), which were roughly based on the three CoI presences as they related to the design of this specific academic program. In order to validate and revise their measure, they recruited one student to provide feedback on the measure (Kumar & Ritzhaupt, 2014). The student offered suggestions about word choice, specifying a time frame in questions, and ways to make survey items more understandable for students. Researchers then recruited 16 students (89% of the cohort) through emails to complete the measure, and they used the data collected to produce descriptive statistics and internal consistency reliability analysis. They concluded that their measure was a useful tool for measuring the CoI of their online academic program, but they also pointed out the program-specific nature of the measure and suggested that further research is needed to develop a scale

that could measure the CoI in other academic programs (Kumar et al., 2011; Kumar & Ritzhaupt, 2014).

Kumar and colleagues' (2011) adaptation of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) was the beginning of development for a needed instrument to measure the CoI of online programs, but their scale development and validation were not sufficient to be used in ongoing research about various online programs. From the initial development of their scale, the goal was to measure the CoI of their specific program (Kumar et al., 2011). The resulting scale was specified to the program it was designed to assess, which limits its usefulness for other online programs. With a sample size of only 16 doctoral students, researchers also did not have enough participants to fully test the psychometrics of their scale (Kumar & Ritzhaupt, 2014). These two limitations illustrate the need for a validated instrument that can measure the CoI in nonspecific online academic programs.

Conclusion

There are two relevant instruments that are important to consider when assessing the need for the development of a measure to assess the CoI presences of online programs. NSSE is an influential measure of social engagement in colleges and universities (Center for Postsecondary Research, n.d.c). It has been shown to be a valid (Kuh, 2009) and useful (Kuh, 2001) instrument for assessing student engagement, but it does not meet the need for a measure to assess the CoI presences in online learning programs because it is not designed for program-level assessment and it does not directly measure the CoI presences. Kumar and colleagues' (2011) adaptation of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) is also a useful measure for assessing what it was designed to measure, which is the CoI presences within a specific online program, but it is not designed to be used with diverse online programs and it

lacks empirical evidence for its validity. Because of the limitations of other measures, there is still a need for a measure that assesses the CoI presence for online programs that is valid and can be used across different programs.

Summary

In this chapter, I presented a literature review of online education, the CoI, and program evaluation measures. Online education has grown in popularity and acceptance, and it is continuing to become more commonplace in higher education (Seaman et al., 2018). Because online education is ubiquitous in higher education, it is important for educators to learn and practice methods that produce meaningful educational experiences in online environments (Nguyen, 2015). The CoI was introduced as a conceptual framework to help guide educators as they seek to create online learning environments that promote learning (Garrison et al., 1999). There is a measure designed to assess the CoI in online courses (Arbaugh et al., 2008), but there is currently a need for a measure to assess the CoI in online academic programs (Kumar et al., 2011). There are also other measures that assess the quality of online academic programs (Center for Postsecondary Research, n.d.a; Kumar et al., 2011), but they are not sufficient to assess the CoI in online academic programs.

The need for a scale that measures the CoI in online academic programs (Kumar et al., 2011) is the gap in the literature that leads to the current study. In order to develop a scale that measures the CoI in online academic programs, I redesigned the questions of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) to assess the CoI on a program level instead of on a course level. I will use factor analysis to test the resulting scale, the Community of Inquiry Program-Level Inventory (CPI), to reveal its latent factor structure and eliminate unneeded items. I will then compare the final CPI scale with other measures that are

theoretically related to test the soundness of its convergent validity. In the next chapter (Method), I will thoroughly describe the proposed method for my study.

CHAPTER THREE: METHOD

The purpose of the present research is to validate the Community of Inquiry Program-Level Inventory (CPI), which is a scale designed to measure the Community of Inquiry (CoI) in online academic programs and developed by adapting the items of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008). I used the following research questions in this study:

1. What are the latent constructs that emerge from the items in the CPI?
2. Does the data from a second sample have a good model fit with what was found in the first sample?
3. Are the CPI subscales related to other measures in a way that is theoretically consistent?

In this chapter, I will describe the methodology used to conduct this research and address the research questions.

Procedures

The data for this study were collected as part of a larger set of survey data on graduate students. Before any data were collected, the institutional review board approved the project. To obtain participants, an email requesting participation was sent to all students enrolled in graduate programs in the School of Behavioral Sciences at a large Christian university. The email included a link to a Qualtrics survey containing questions about demographics and a variety of measures. All participation was voluntary, and students did not receive any compensation for completing the survey. All survey responses were downloaded from Qualtrics and put into SPSS

for data screening and analysis. Data screening was performed by eliminating cases with incomplete responses, inattentive responding, and multivariate outliers.

Participants

First Sample

The first sample consisted of 257 students enrolled in online graduate programs in Marriage and Family Therapy, Pastoral Counseling, and Addictions Counseling (see Table 1). Participants were primarily women (*n* = 198; 77.0%) with some men (*n* = 59; 23.0%). The majority identified as White or Caucasian (*n* = 166; 64.6%) with others identifying as Black or African American (*n* = 61; 23.7%), Hispanic or Latino (*n* = 11; 4.3%), Asian (*n* = 5; 1.9%), American Indian or Alaska Native (*n* = 1; 0.4%), and other (*n* = 13; 5.1%). Over two-thirds of participants were married (*n* = 176; 68.1%) with some identifying as single (*n* = 48; 18.7%), divorced (*n* = 28; 10.9%), widowed (*n* = 4; 1.6%), and separated (*n* = 2; 0.8%). Almost half of participants were employed full-time (*n* = 121; 47.1%), some were unemployed (*n* = 71; 27.6%) or employed part-time (*n* = 63; 24.5%), and two people (0.8%) did not report their employment status.

Second Sample

The demographics of the second sample were similar to those of the first sample. The second sample was made up of 333 students enrolled in a graduate program in Human Services Counseling (see Table 1). Participants were primarily women (*n* = 274; 82.3%) with some men (n = 59; 17.7%). The majority identified as White or Caucasian (*n* = 188; 56.5%) with some identifying as Black or African American (*n* = 100; 30.0%), Hispanic or Latino (*n* = 25; 7.5%), Asian (*n* = 2; 0.6%), American Indian or Alaska Native (*n* = 2; 0.6%), Native Hawaiian or Pacific

Islander (*n* = 1; 0.3%), and other (*n* = 13; 3.9%); two people (0.6%) did not report their ethnicity. Over half of participants were married (*n* = 202; 60.7%) with some identifying as single (*n* = 76; 22.8%), divorced (*n* = 35; 10.5%), separated (*n* = 7; 2.1%), widowed (*n* = 1; 0.3%), and other (*n* = 4; 1.2%); eight people (2.4%) did not report their relationship status. Over two-thirds of participants were employed full-time (*n* = 229; 68.8%), some were unemployed (*n* = 63; 18.9%) or employed part-time (*n* = 40; 12.0%), and one person (0.3%) did not report an employment status.

Table 1

Demographic	Sample 1	Sample 2
Program		
Addictions Counseling M.A.	28	0
Marriage and Family Therapy M.A.	103	0
Pastoral Counseling M.A.	99	0
Human Services Counseling M.A.	0	333
Ethnicity		
Black or African American	57	100
Hispanic or Latino	9	25
Native Hawaiian or Pacific Islander	0	1
White or Caucasian	145	188
American Indian or Alaska Native	1	2
Asian	5	2
Other	13	13
Relationship Status		
Single	39	76
Married	160	202
Separated	2	7
Divorced	25	35
Widowed	4	1
Other	0	4
I prefer not to respond	0	6

Measures

Community of Inquiry Program-Level Inventory (CPI)

The CPI was designed to measure the CoI in online academic programs by adapting the items in the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008), which is a scale that measures the CoI of online courses. Each individual scale item was adapted from the original focus on individual online courses (e.g., "I feel comfortable conversing through an online medium" and "The instructor helped to focus discussion on relevant issues in a way that helped me to learn") to the CPI's focus on online programs (e.g., "I feel comfortable conversing through an online medium for my courses" and "My professors help to focus discussion on relevant issues in a way that helps me learn"). Aside from the modifications to the wording of items, all other characteristics of the original scale (Arbaugh et al., 2008) remained consistent in the CPI. Both scales consist of 34 items with Likert scale responses of 0 (*Strongly Disagree*) to 4 (*Strongly Agree*), and both scales have items that are specifically designed to measure the cognitive presence, social presence, and teaching presence of the CoI.

National Survey of Student Engagement (NSSE)

The National Survey of Student Engagement (NSSE) is a scale that measures students' social involvement in colleges (Center for Postsecondary Research, n.d.a). It measures student engagement by using four themes (i.e., academic challenge, learning with peers, experiences with faculty, and campus environment), and each theme has subcategories (called engagement indicators) within it (Center for Postsecondary Research, n.d.b). In addition to the themes, it measures the presence of six specific practices (i.e., service-learning, learning community, research with faculty, internship or field experience, study abroad, and culminating senior experience) that are hypothesized to impact students in meaningful ways (Center for

Postsecondary Research, n.d.a). Survey items have a variety of response formats. For scoring, all items are converted to 60-point scales then the means of the engagement indicators subscales are calculated (Center for Postsecondary Research, n.d.b).

Data Analysis

In order to address the research questions of this study, I performed exploratory and confirmatory factor analysis after conducting appropriate data screening techniques. To address the first research question (i.e., What are the latent constructs that emerge from the items in the CPI?), I performed exploratory factor analysis on the first sample data and made adjustments to the scale based on the results. To address the second research question (i.e., Does the data from a second sample have a good model fit with what was found in the first sample?), I used confirmatory factor analysis on the second sample data. If needed, I intended to make adjustments and perform additional confirmatory factor analyses on other samples until I found a good model fit. To address the third research question (i.e., Are the CPI subscales related to other measures in a way that is theoretically consistent?), I tested the convergent validity by examining the correlation between the social presence subscale of the CPI and the NSSE, which should be consistent from a theoretical standpoint.

Summary

In this chapter, I explained the methodology for this research. I reviewed the purpose of this study and the research questions, the procedures that I have followed, the demographics of the participants for my two samples, the measures that I administered, and the statistical approaches that I used. In the next chapter, I will describe the results of this study. To address my three research questions, I will examine the results of an exploratory factor analysis, a confirmatory factor analysis, and correlations to test the convergent validity.

CHAPTER FOUR: RESULTS

The purpose of this study is to develop and validate the Community of Inquiry Program-Level Inventory (CPI), which is a measure to assess the Community of Inquiry (CoI) in academic programs. I developed the CPI by adapting the items of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008), a course-level measure of the CoI, to address the CoI of academic programs. The CoI is a conceptual framework of online education that emphasizes the role of the social learning environment in online education (Garrison et al., 1999). There are numerous publications that support the use of the CoI for improving the quality of learning in online courses (Stenbom, 2018). Some recent research has focused on the role of the CoI in online academic programs and identified the need for an inventory to assess the CoI in online programs (Kumar et al., 2011; Kumar & Ritzhaupt, 2014).

In this chapter, I will describe the results of the present study. The analytical techniques were guided by the research questions. To address the first research question (What are the latent constructs that emerge from the items in the CPI?), I used exploratory factor analysis. To address the second research question (Does the data from a second sample have a good model fit with what was found in the first sample?), I used confirmatory factor analysis. To address the third research question (Are the CPI subscales related to other measures in a way that is theoretically consistent?), I examined the correlations between the CPI subscales and the subscales of the National Survey of Student Engagement (NSSE) that are theoretically measuring similar constructs.

Exploratory Factor Analysis

Exploratory factor analysis using maximum likelihood extraction with direct oblimin (oblique) rotation was used to test the potential latent factors accounting for variability in the correlation matrix for the initial set of 34 inventory items. The first analysis retained factors that had an eigenvector of at least one and at least three items with an absolute loading of at least 0.3. I removed items with cross-loadings by repeatedly removing the item with the lowest loading and rerunning the analysis until there were no longer any items with cross-loadings. The final analysis revealed a four-factor structure accounting for 71% of the variance of the 27 items that were retained in the CPI (see Table 2).

Cognitive Presence

The first factor consists of nine items adapted from the cognitive presence subscale of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008). All of the items from the cognitive presence subscale loaded onto this factor except three items that were eliminated (i.e., “Problems posed increase my interest in course issues.” “Course activities pique my curiosity.” and “Online discussions help me to develop a sense of collaboration.”). This subscale has high internal consistency with a Cronbach’s alpha of .94. This subscale is expected to have a strong positive correlation with the higher-order learning and the reflective and integrative learning subscales of the NSSE (Center for Postsecondary Research, n.d.b).

Teaching Presence: Instructional Design

The four items in the second factor are all of the items adapted from those designed to measure the instructional design category of the teaching presence in the original inventory (Arbaugh et al., 2008). These items are related to course design and organization (e.g., “My courses are designed to clearly communicate important due dates/time frames for learning

activities." and "My courses are designed to clearly communicate important course topics."). The internal consistency for this subscale is high with a Cronbach's alpha of .94. This subscale is expected to have a strong positive correlation with the effective teaching practices subscale of the NSSE (Center for Postsecondary Research, n.d.b).

Teaching Presence: Facilitation and Instruction

The eight items in the third factor were adapted from items designed to measure the facilitating discourse and direct instruction categories of the teaching presence in the original inventory (Arbaugh et al., 2008). These items are related to teachers' roles as facilitators (e.g., "My professors are helpful in guiding my classes toward understanding course topics in a way that helps me clarify my thinking.") and direct instructors (e.g., "My professors provide feedback that helps me understand my strengths and weaknesses relative to course goals and objectives."). The internal consistency for this subscale is high with a Cronbach's alpha of .95. This subscale is also expected to have a strong positive correlation with the effective teaching practices subscale of the NSSE (Center for Postsecondary Research, n.d.b).

Social Presence

The six items in the fourth factor are some of the items adapted from items designed to measure the social presence in the original inventory (Arbaugh et al., 2008). Three of the items are related to the interactive category of social presence (e.g., "I feel comfortable interacting with other course participants.") and the other three are related to the cohesion category (e.g., "I feel comfortable disagreeing with other course participants while still maintaining a sense of trust."). None of the items related to the affective category (e.g., "Getting to know other course participants gives me a sense of belonging in my courses.") were included in this factor. This subscale has high internal consistency with a Cronbach's alpha of .89. This subscale is expected

to have a strong positive correlation with the collaborative learning subscale of the NSSE (Center for Postsecondary Research, n.d.b).

Table 2

Final Factor Structure (Pattern Matrix) of Maximum Likelihood (ML) with Oblique Rotation

	Factors				
	1	2	3	4	r^2
I can describe ways to test and apply the knowledge created in my courses.	.878				.771
I have developed solutions to course problems that can be applied in practice.	.867				.751
Reflection on course content and discussions help me understand fundamental concepts in my courses.	.692				.479
Combining new information helps me answer questions raised in course activities.	.676				.457
Learning activities help me construct explanations/solutions in my courses.	.672				.452
I can apply the knowledge obtained in my courses to my work or other non-class related activities.	.620				.384
I utilize a variety of information sources to explore problems posed in my courses.	.589				.347
I feel motivated to explore content related questions.	.548				.300
Brainstorming and finding relevant information helps me resolve content related questions.	.497				.247
My courses are designed to clearly communicate important course goals.		-.895			.802

Table 2

Final Factor Structure (Pattern Matrix) of Maximum Likelihood (ML) with Oblique Rotation

	Factors				
	1	2	3	4	r^2
My courses are designed to clearly communicate important course topics.		-.817			.667
My courses are designed to clearly communicate important due dates/time frames for learning activities.		-.658			.433
My courses are designed to provide clear instructions on how to participate in course learning activities.		-.580			.336
My professors help keep the course participants on task in a way that helps me to learn.			.844		.712
My professors are helpful in guiding my classes toward understanding course topics in a way that helps me clarify my thinking.			.810		.656
My professors are helpful in identifying areas of agreement and disagreement on course topics that help me learn.			.788		.622
My professors help to focus discussion on relevant issues in a way that helps me learn.			.750		.562
My courses are designed to help keep course participants engaged and participating in productive dialogue.			.735		.540
My professors encouraged course participants to explore new concepts in my courses.			.718		.515
My courses are designed to reinforce the development of a sense of community among course participants.			.705		.497

Table 2

Final Factor Structure (Pattern Matrix) of Maximum Likelihood (ML) with Oblique Rotation

	Factors				
	1	2	3	4	r^2
My professors provide feedback that helps me understand my strengths and weaknesses relative to course goals and objectives.			.621		.386
My professors provide feedback that helps me understand my strengths and weaknesses relative to course goals and objectives.				-.856	.733
I feel comfortable interacting with other course participants.				-.808	.653
I feel comfortable participating in course discussions.				-.633	.400
I feel comfortable disagreeing with other course participants while still maintaining a sense of trust.				-.512	.262
I feel that my point of view is acknowledged by other participants in my courses.				-.462	.214
I feel comfortable conversing through an online medium for my courses.				-.428	.183

Confirmatory Factor Analyses

Confirmatory factor analysis (CFA) was performed on the second sample by testing the model fit of the four-factor model of the CPI with the intention of revising and retesting the model fit until a good fit was obtained. I assessed the model fit for CFA using MPLUS (8.2; 2018) and the estimation method of maximum-likelihood with Sattorra-Bentler adjustment. I used Standardized Root Mean Residual (SRMR) with a close-fit cutoff of <.08, Root Mean

Square Error of Approximation (RMSEA) with a close-fit cutoff of <.06, and Comparative Fit Index (CFI) with a close-fit cutoff of >.95 (Hu & Bentler, 1999). Because the four factors were highly correlated with each other, I used a bifactor model for the CFA, which revealed a close model fit for the 27-item CPI (SRMR = .030; RMSEA = .047; CFI = .965).

Convergent Validity

In order to test the convergent validity of the CPI subscales, I first considered the relationships within the three subscales then I considered the relationships between the subscales and other factors that are theoretically related. Consistent with the theoretical model of the CoI (Garrison et al., 1999) and with previous research (Kozan & Richardson, 2014), the subscales are strongly correlated with each other. The variance accounted for by the relationship between subscales is 41% for cognitive presence and teaching presence: instructional design, 42% for cognitive presence and teaching presence: facilitation and instruction, 47% for cognitive presence and social presence, 49% for teaching presence: instructional design and teaching presence: facilitation and instruction, 33% for teaching presence: instructional design and social presence, and 45% for teaching presence: facilitation and instruction and social presence.

It was expected that the CPI subscales would be correlated with NSSE engagement indicators that are theoretically consistent (see Table 3). I expected cognitive presence to be related to higher-order learning because of their shared emphasis on cognitive engagement, and they were strongly correlated (r = .514). I expected that the cognitive presence would also be related to reflective and integrative learning, and there was a strong correlation between the two (r = .539). I expected that both of the teaching presence subscales would be related with effective teaching practices, and there was a strong correlation between effective teaching practices and both teaching presence: instructional design (r = .557) and teaching presence: facilitation and

instruction (r = .667). I expected social presence to be related to collaborative learning because they both consist of social engagement in academic settings, and they have a weak relationship (r = .201).

Table 3

Presence	Reflective and Integrative Learning	Higher-Order Learning	Student-Faculty Interaction	Effective Teaching Practices	Supportive Environment
			Sample 1		
Cognitive	.515**	.497**	.016	.449**	.283**
Teaching: Instructional Design	.379**	.478**	.008	.554**	.242**
Teaching: Facilitation and Instruction	.411**	.374**	.168*	.664**	.398**
Social	.409**	.367**	.053	.458**	.265**
			Sample 2		
Cognitive	.612**	.608**	.270**	.517**	.485**
Teaching: Instructional Design	.505**	.449**	.131*	.612**	.436**
Teaching: Facilitation and Instruction	.484**	.442**	.188**	.660**	.502**
Social	.483**	.410**	.285**	.496**	.472**

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).

Summary

In this chapter, I described the results of this study including the results of an exploratory factor analysis to discover the factor structure of the CPI, a confirmatory factor analysis to test the fit of the CPI's factor structure in a second sample, and correlations to test the convergent validity of the CPI subscales. The exploratory factor analysis revealed a four-factor structure that consisted of subscales representing the cognitive presence, teaching presence: instructional design, teaching presence: facilitation and instruction, and social presence. The confirmatory factor analysis revealed a close model fit. All of the correlations to test the convergent validity were strong with the exception of social presence with collaborative learning. In the next chapter, I will provide a detailed summary of the purpose and findings of this study, discuss the conclusions of the results, present some implications of this research, explain the limitations, and give suggestions for future research.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

In this chapter, I will discuss the findings and implications of this study. I will provide a brief overview of the purpose of the present research, summarize the method of this research, and present the results. I will discuss my conclusions from the findings of the present research and the implications of these findings. Finally, I will state the limitations of the present research and provide suggestions for future directions of research.

Summary

I will begin by giving an overview of the contents of the previous chapters. In the first chapter, I gave an introduction to the research problem and explained the value of the present study. In the second chapter, I discussed the research literature relevant to online education, the Community of Inquiry (CoI), and measures for assessing online learning environments. In the third chapter, I explained the methodology of the present study. In the fourth chapter, I presented the results of an exploratory factor analysis, a confirmatory factor analysis, and correlations to test convergent validity.

The Present Study

The CoI is a model of effective online education suggesting that quality education occurs within a community of learners who are actively engaged and invested in the learning process (Garrison et al., 1999). The CoI is made up of three presences, which are the cognitive presence, social presence, and teaching presence. Arbaugh and colleagues (2008) produced the Community of Inquiry Framework Survey Instrument, which is a measure to assess the CoI in online courses, but there is still a need for a measure to assess the CoI in online academic programs (Kumar et

al., 2011). The purpose of the present research is to develop and validate the Community of Inquiry Program-Level Inventory (CPI), which is a program-level assessment of the CoI.

Method

I created the CPI by adapting the items of the Community of Inquiry Framework Survey Instrument (Arbaugh et al., 2008) to reflect the CoI of academic programs instead of individual classes. Participants were recruited through an email that was sent to students enrolled in online graduate programs in a School of Behavioral Sciences. Students who chose to complete the online Qualtrics survey completed several measures including the CPI and the National Survey of Student Engagement (NSSE). Data were downloaded from Qualtrics, imported into SPSS, and received appropriate data screening techniques before statistical analyses were performed.

Results

Exploratory factor analysis and confirmatory factor analysis. The exploratory factor analysis for the CPI revealed a four-factor model structure. The cognitive presence subscale included most of the items that were designed to measure the cognitive presence. The three items that were eliminated from the cognitive presence subscale did not appear to exhibit any meaningful pattern. The items designed to measure the teaching presence were bifurcated into two distinct subscales instead of one. The items designed to measure the instructional design category of the teaching presence were grouped into one subscale (teaching presence: instructional design) while the items designed to measure the facilitating discourse and direct instruction categories of teaching presence were grouped into a different subscale (teaching presence: facilitation and instruction). The items designed to measure the social presence formed one factor with all of the items designed to measure the interactive and cohesive categories of social presence included in the subscale and all of the items designed to measure the affective

category eliminated. The confirmatory factor analysis on a second sample showed a close model fit for the four-factor model.

Convergent validity. Correlations were used to test the convergent validity of the CPI subscales, and most of the relationships were as expected. All of the CPI subscales were strongly positively related to each other. The cognitive presence subscale was strongly positively related to both higher-order learning and reflective and integrative learning. Both of the teaching presence subscales were strongly positively correlated with effective teaching practices. The only relationship that was not as strong as expected was the one between social presence and collaborative learning, which was a weak positive relationship instead of a strong positive relationship.

Findings

There are several interesting conclusions that can be made from the findings of this study. The cognitive presence items formed a single subscale, which appears to be consistent with the cognitive presence construct of the CoI (Garrison et al., 1999; Garrison et al., 2001). The items designed to measure teaching presence were bifurcated into two separate factors with one factor measuring instructional design and the other measuring facilitating discussion and direct instruction. The separation of the teaching presence subscales is somewhat inconsistent with the theoretical framework of the CoI (Anderson et al., 2001; Garrison et al., 1999), but it is consistent with some previous research (Arbaugh, 2007; Arbaugh et al., 2008; Bangert, 2009; Shea, Li, & Pickett, 2006). The social presence loaded as one factor, which is consistent with the CoI model (Garrison et al., 1999; Rourke et al., 1999), but all of the items designed to measure the affective category were eliminated from the subscale.

Cognitive Presence

The exploratory and confirmatory factor analyses produced the cognitive presence factor as expected, and the factor showed good convergent validity. The construct of cognitive presence has four stages, which are triggering event, exploration, integration, and resolution (Garrison et al., 1999; Garrison et al., 2001). Of the twelve items in the initial CPI designed to measure the cognitive presence, there were three designed to measure each of the four phases of cognitive presence. Three of the initial items were eliminated during the exploratory factor analysis with two items relating to the triggering event phase and one item relating to the exploration phase eliminated. There does not appear to be any pattern that explains why those three items were eliminated, and it is not known if the elimination of those items affects the validity of the subscale. The final subscale showed good convergent validity by having strong positive correlations with higher-order learning and reflective and integrative learning, which are theoretically consistent with the construct of cognitive presence.

The final cognitive presence subscale of the CPI was consistent with previous research. The original exploratory factor analysis for the course-level Community of Inquiry Framework Survey Instrument revealed a factor structure that placed all of these items together in one factor (Arbaugh et al., 2008). Later, a confirmatory showed a good model fit for the scale with all of the cognitive presence items as one factor (Bangert, 2009). The items of this subscale were designed to measure the four phases of cognitive development from the CoI framework so this subscale's emergence as a single factor is consistent with the CoI model and the conceptualization of the four phases of the cognitive presence (Garrison et al., 1999; Garrison et al., 2001).

Teaching Presence

The items designed to measure teaching presence were divided into two factors, and both of the teaching presence factors showed good convergent validity. The teaching presence construct consists of three categories that represent different roles of instructors, which are instructional design, facilitating discussion, and direct instruction (Anderson et al., 2001; Garrison et al., 1999). The initial item battery of the CPI contained four items to measure instructional design, five items to measure facilitating discourse, and three items to measure direct instruction. The items designed to measure instructional design loaded into one factor while the items designed to measure facilitating discourse and direct instruction loaded into a separate factor. While the three categories are conceptualized as parts of the single construct of teaching presence, the results of this study suggest that teaching presence may actually consist of two distinct components. Both factors had good convergent validity with strong positive relationships with effective teaching practices, which is theoretically consistent with the construct of teaching presence.

There are several possible explanations for the teaching presence items to separate into two distinct factors, but more research is needed to fully investigate this finding. All participants were obtained from a university that employs rigid designs in online courses to ensure uniformity. All online courses follow an eight-week format with the content, assignments, and calendars of each course section predetermined. Instructors of individual online classes do not have control over the decisions that make up the instructional design category of the teaching presence. In contrast, instructors do have control over how they interact with students in discussions, the content they post in course announcements, and the feedback they provide on assignments. While instructors do not provide the instructional design, they do have the ability to

engage in the facilitating discussion and direct instruction categories of the teaching presence. In these programs, the instructional design category may represent the presence of the course designers who are only present prior to the start of the actual course, and the facilitating discussion and direct instruction categories may represent the presence of the instructor who is involved throughout the eight weeks of the course.

According to the CoI framework, the three categories of the teaching presence should all intertwine with each other and collectively make up the role of the teacher in the learning community (Anderson et al., 2001; Garrison et al., 1999). While the bifurcation of the teaching presence is inconsistent with the theoretical conceptualization of the teaching presence, this finding is consistent with previous research on measuring the CoI. When Arbaugh and colleagues (2008) published the Community of Inquiry Framework Survey Instrument, they stated that the results of their factor analysis were somewhat inconclusive about the possible presence of a fourth factor. They concluded that the scale has a three-factor model, but they also included an explanation of the possibility of a statistical separation between instructional design and the other categories of teaching presence. They emphasized that any separation of the teaching presence would be the result of imprecise measurement and not a change in the conceptualization of the CoI, which considers teaching presence to be one construct. They also pointed out the possibility that the factor analysis was sensitive enough to detect the separate categories within the teaching presence subscale, which were intended to be present.

Before the publication of the final Community of Inquiry Framework Survey Instrument, Arbaugh (2007) and Shea and colleagues (2006) presented findings on earlier versions of the instrument that also pointed to the possibility of teaching presence consisting of two factors. Arbaugh (2007) presented the three CoI presences with the teaching presence factor comprised

of the facilitating discourse and the direct instruction categories and the instructional design factor as an independent (i.e., not teaching presence) factor. Shea and colleagues (2006) concluded that teaching presence consisted of an instructional and design organization factor (i.e., instructional design) and a directed facilitation factor (i.e., facilitating discourse and direct instruction). After Arbaugh and colleagues (2008) developed and published the Community of Inquiry Framework Survey Instrument, Bangert (2009) performed an exploratory factor analysis that initially yielded four factors with the instructional design items in a separate factor from the other items designed to measure teaching presence. Arbaugh (2007) suggested that time may be the reason for the bifurcation of the teaching presence and emphasized that most of the activities related to the instructional design category occur prior to the beginning of the course and most of the activities related to the other categories occur during the duration of the course.

Social Presence

The exploratory and confirmatory factor analyses resulted in a single factor for social presence that excluded the affective category items. The initial social presence subscale of the CPI contained three items to measure each of the three categories of social presence in the CoI model, which are affective, interactive, and cohesive (Garrison et al., 1999; Rourke et al., 1999). All six of the items designed to measure the interactive and cohesive categories loaded onto this factor, but none of the items designed to measure the affective category were retained in the final scale. While there is a clear pattern to the items that were retained and those that were eliminated, there is not a clear reason for why the affective category items were not retained in the final scale.

The subscale of social presence as one factor is consistent with the CoI framework and previous research on measuring the CoI, but the exclusion of the affective category of social

presence is inconsistent with both the CoI model and previous research. The CoI model conceptualizes the social presence as consisting of the three categories of affective, interactive, and cohesive (Garrison et al., 1999; Rourke et al., 1999). The results of my study remove the affective category from the measurement of the social presence, which removes a major aspect of social presence from the subscale intended to measure social presence. Arbaugh and colleagues' (2008) original development and statistical validation of the Community of Inquiry Framework Survey Instrument included all of the items in the social presence subscale. The exclusion of these items in my results may reflect potential diminishment of the importance of the affective category in current online educational practices or it may be the result of some anomaly within the participants' educational environment. Further research is needed to determine the meaning and impact of this finding.

The correlation to test the convergent validity of the social presence subscale also produced results that were somewhat inconsistent with the theoretical conceptualization. I expected the social presence subscale to have a strong positive correlation with collaborative learning as measured by the NSSE (Center for Postsecondary Research, n.d.b), but the two scales were only weakly positively related in my results. This may be explained by the items used to measure the two constructs. The items in the collaborative learning subscale are phrased in a manner that may be more appropriate to measure collaborative learning in a traditional educational environment than in an online learning environment. In contrast, the items in the social presence subscale were designed to measure social presence in an online learning environment. Because of the different targets for the two scales, a weak correlation may be consistent with the characteristics of the two constructs.

Implications

This study presents a measure for assessing the CoI of online academic programs that may be useful for program developers and professors who desire to enhance the quality of online programs. It is important to address the program-level CoI because much of the atmosphere of online educational programs is present throughout the program. The learning community does not restart at the beginning of each class, so we need to acknowledge the presence of a program-level CoI. The bifurcation of the teaching presence subscale presents an example of the influence of program-level factors on the CoI. The items in the teaching presence: instructional design scale represent decisions that are made at a program-level by administrators or course developers. The decisions that affect the results of this subscale are outside the control of individual instructors, but they have a meaningful impact on the learning environment of the program and each individual course.

The findings of this research have specific implications for counselor educators. It is important to remember that the training of counselors occurs over time and across multiple classes and experiences. Counselor educators must attend to students' development both in individual courses and in the program as a whole. Instead of focusing on the knowledge and skills to be taught in any single class, counselor educators should take a broader view of the educational experience by focusing on how each individual class fits into the program. It is especially important for professors in online counselor education programs to approach education from a programmatic perspective because online programs tend to have a subtler student culture with less structure. Online students may benefit from having professors who discuss student development at a program level in addition to a course level because it would

help students understand their progression as counselors-in-training instead of simply taking a sequence of individual courses.

Limitations

This study has some limitations that are important to note in the consideration of implications. First, the CoI framework has an inherent assumption that the learning community has an effect on the quality of learning, and all research that extends from the CoI model includes this underlying assumption. My research did not address the subject of causation or make any causal inferences, but the assumption that stronger CoI presences lead to better quality learning is an underlying assumption. Second, the data in this study were obtained using a survey with voluntary participation, which means that these participants may not have been representative of the student body and may have systematic differences that affect their survey responses. Third, the data were obtained by self-report measures, which introduces the possibility of accidentally inaccurate or intentionally deceptive responses. While there is no indication that any of these limitations had a significant effect on the results of this study, there is no way to determine if the results were affected by these or other limitations.

Suggestions for Future Research

There are several avenues that should be explored in future research. The inconsistencies and unexpected findings of this study present several areas of potential research. The bifurcation of the teaching presence needs to be further explored to determine if there are two distinct factors within the teaching presence or if the instructional design factor is representative of another influence on the CoI separate from teaching presence. The elimination of the items intended to measure the affective category of social presence also presents a future research topic. Research is needed to determine if the social presence subscale is a valid measure of social presence

without the affective category items or if items are needed to measure the affective category in order to fully assess social presence.

Further research is also needed to determine how to measure the CoI in counselor education programs. The unique characteristics of the field of counseling and the training of counselors may require alterations of the CPI to assess all aspects of the CoI in online counseling programs. As a measure intended for general use in online academic programs, the CPI is not designed to address how the CoI manifests in basic counseling skills training, counselor supervision, and other aspects of counseling programs that are unique to this field. The nature of counselor education, which requires students to interact with faculty and other students to practice skills, may change the specific characteristics of the CoI. The importance of the CoI presences in the community of learning may be even more pronounced in counselor education due to the heavy reliance on interactive and applied learning methods.

Summary

In this chapter, I summarized the findings of this study and discussed implications. Most of the findings of this study were congruent with theoretical conceptualizations and previous research, but a few findings were unexpected and require future research to understand. Specifically, further research is needed to explain the separation of the teaching presence items into two subscales and the elimination of the affective category items from the social presence subscale. The results of this study suggest that the instructional design aspect of teaching presence may be a distinct factor from the other teaching presence categories in online academic programs. The results suggest that the CPI may offer a valid method for assessing the CoI of online programs. The CPI may be a useful tool for academicians and program developers seeking to assess and improve the CoI in online academic programs.

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