

An Exploration of the Literature and Proposed Research Incorporating The Community of Inquiry: An Online Course Design and Implementation Framework, and Related Research

Instrument

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The Community of Inquiry (CoI) framework is the assertion that learning in an online environment is enhanced when care is given to the development and delivery of the course at the intersection between the existence of three presences, social, cognitive, and teaching (Garrison, Anderson, & Archer, 2000). Developed and researched over the last seventeen years, CoI provides a prescriptive model for creating courses for online learning environments. Specific environments such as a learning management system (LMS), message board, or a wiki are not suggested but the level and importance of interaction between students-students, teacher-student, and student-content are recommended. CoI has enjoyed great success as a tool for creating online learning. A research instrument for assessment has been created that adds validity to the model given the positive responses of the studies conducted. Even if results of a study of an online course that utilized CoI as a model for creation and delivery were not positive in all three areas of CoI, social presence, cognitive presence, and teaching presence, the study could be used to understand if there are weaknesses in the course design or implementation to be used for future development of the course. Having a framework for creating an online course and the ability to study the results of learning within that course is valuable.

Literature Review

The following is annotations of the seminal works related to CoI and several studies conducted using CoI. Care was taken to locate peer-reviewed articles and those acknowledged as important works toward the future study of online learning and CoI. A focus was on retrieving articles and studies that have been published within the last ten years with more weight given to those articles published within the last five years save the seminal works. Articles are listed here in chronological order with a reference list at the end of this paper.

The Garrison, Anderson, & Archer (2000) is the seminal study that gave Community of Inquiry its birth. This study focused first on a complex review and coding of computer-mediated communication (CMC) in higher education programs. This portion of the study led to a creation of a conceptual framework for successful computer conferencing in higher education, the three presences of the Community of Inquiry (CoI). The three presences include social, cognitive, and teaching presences and their sub-elements along with indicators for each of the categories. A final template was created to be a guide and a tool for future research. The suggested research included continuing to refine categories and indicators of the three core elements and that the template and its refinements would be used in future research toward assessing different approaches to distributed education. The research and articles that follow are a direct result of this seminal work on the topic of the Community of Inquiry model for distributed education.

Garrison, Cleveland-Innes, & Fung (2004) assert the necessity for online learners to adjust their participation primarily by adjustments to student's perceptions of their role in the online course. As online learners in an asynchronous, text-based learning environment, the establishment of social identity within the environment of discourse is critical to learning (Garrison, Cleveland-Innes, & Fung, 2004, p. 61). The larger research goal of this study was to establish a validated instrument through factor analysis of an instrument to be used in future studies to measure role identity adjustments for learners, or social presence in a CoI created course. The research produced a revised questionnaire that was published within the article (Garrison, Cleveland-Innes, & Fung, 2004).

Adjustments to the role of the learner are summarized in four key points “ [1] knowledge about, skill with, and acceptance of the technology, [2] new modes and amounts of communication with instructors, peer and administrators, [3] increased levels of learner self-

direction, and [4] a new 'place' for learning in time (anytime, usually determined by the learner and their life circumstances) and space (anywhere, dependent upon equipment requirements).

The authors of this study make these and several other assertions as to the nature of learners in sociological construct. Interesting is that of the eleven references, five were by the authors of this study. The original 28 Likert-type questions were piloted with 65 graduate students within the researcher's university responding. The 28 questions were given to students twice at the beginning of a course but framed differently. First, in the context for students to relate their experiences with face-to-face learning and the second asking student's to answer the same questions with regard to their experiences of online learning. Details of the plot, factor, and reliability analysis follow with the authors giving details on the results. As expected, extremely high returns validating most of the items were returned.

The Stodel, Thompson, and MacDonald (2006) study is an example of the studies that took place after the establishment of CoI (Garrison, Anderson, & Archer, 2000) that utilized the CoI framework as a template for analysis of online learning. This was a qualitative study via interviews of ten learners in a master in an education course at a Canadian university. The course was delivered with the first session completely face-to-face (F2F) and the remaining sessions completely online. After the course was completed, students reported that they had an overall positive experience with the course and 11 reported that they missed something that was otherwise available in an F2F course. This study was an analysis of a pair of interviews of 10 of these 11 students. The interviews were analyzed using a constant comparative method and twice over reviewed and compared for consistency with category creation. Data was then interpreted using the CoI framework with particular attention to social presence. The article does address all three presences but the researchers note the limitations of the study given the interviewees were

selected specifically because they felt they were missing something in the online portion of the course. The researchers concluded that using the CoI as a benchmark for interpreting the data revealed the interrelationship of the three presences and that one was ever dependent on the other. In addition, learners had expectations of the online experience to be similar in the quality level of interactions with other participants and the instructor and the lack of similarity may have been the source of disappointment for the participants.

Researchers Cleveland-Innes, Garrison (the very same who originated CoI), and Kinsel embarked on a study of graduate students enrolled in two entry-level courses at a university in Canada (Cleveland-Innes, Garrison, & Kinsel, 2007). The purpose of the study was to assess the experiences of these novice online learners with regard to what adjustments they felt they needed to make to be successful in the course. The literature review includes an overview of CoI and includes the added distinction of “role adjustment” (Cleveland-Innes, Garrison, & Kinsel, 2007, p.4) as the central theme for their study. The researchers defined role adjustment as a psychological construct, in this case, of the learner participant. The researchers make the distinction that, “An adjustment from the more generalized role of learner, the responsibilities, and requirements of working online are not readily apparent to those new to the role” (Cleveland-Innes, Garrison, & Kinsel, 2007, p. 4) and their study sets out to discover what the participants reveal about their adjustments to online learning. The researchers use the CoI framework to reveal five themes of interest, interaction, instructor role, self-identity, course design, and technology and categories these constructs within the three presences of CoI, cognitive, social, and teaching and their interrelations.

The researchers concluded that the required adjustments to online learning for students to be successful included actions by the student and also actions by the instructor before and during

the course. Adjustments to what the student perceives as their role can be adjusted during the course with instructor guidance and the researchers make some recommendations. For instructors, acknowledge and be prepared to make adjustments and have professional training for instructors to recognize and make adjustments. Build time into the course for participants to gain needed skills to negotiate the technology requirements of the course. Maintain separation of social and content specific dialogue interactions amongst participants. Limit participants' length of forum postings and maintain strict adherence to the content subject to diminish socializing in the forums. Have greater instructor participation at the beginning of the course then less as it progresses. Instructors should not assume participants understand proper "netiquette" and should be instructed in expectations. Instructors are encouraged to communicate through private email any concerns they have of a single participant who might be dominating the online conversations and to those who may not be participating as much as an instructor might like.

Researcher and one of the founders of CoI, Garrison, returns with co-researcher Arbaugh after several years of interest by other researchers in CoI to present a literature review of the recent research that utilized CoI (Garrison & Arbaugh, 2007). Garrison & Arbaugh (2007) use their article as an opportunity to restate the structure of CoI and present, again, the template created seven years prior (Garrison, Anderson, & Archer, 2000) while interjecting post CoI creation studies as reinforcement of the framework's validity. It seems their intention was to generate ideas for potential research using CoI that includes "quantitatively-oriented studies, the need for more cross-disciplinary studies, and the opportunities for identifying factors that moderate and/or extend the relationship between the framework's components and online course outcomes." (Garrison & Arbaugh, 2007, p. 157). Garrison and Arbaugh (2007) call to action by like-minded researchers to conduct studies that add to the validity of CoI by utilizing quantitative

empirical studies and those that utilize “psychometrically sound instruments” (p.166) that could be used in meta-analysis between discipline and across institutions.

Anderson’s article (2008) is an examination of learning theory with a specific eye toward online learning as a context to help develop theories specific to online learning. The article may have already been dated when it was written given references to the computer and online technology included articles from 1976 and 1996. Anderson describes attributes of learning from a specific perspective of a learner-centered context. He makes note of social and community contexts of learning with a nod to Garrison’s early writings especially that in which he was a lead author in 1998. Anderson discusses six forms of interactions that are possible between learners, teachers, and content, and suggests a model of e-learning based on these interactions as a first step toward developing a specific online learning theory. Anderson refers to community interactions and the role community plays in learning but it is interesting that the term “community of inquiry” exists not as a separate model but a branch of his own model that connects the teacher and online synchronous or asynchronous communication. This article appears to include some of the same concepts of the CoI but takes a stab at a different model.

Although headed by Swan, Garrison, Cleveland-Innes, and Arbaugh appear together in a study aimed at validating a measurement tool specifically for the three presences in the CoI framework (Swan, Richardson, Ice, Garrison, Cleveland-Innes, & Arbaugh, 2008). The study focused on a recently developed instrument intended to be a common instrument to be adopted by the research community. This instrument was an amalgam of three previous research instruments. The result was a 34-item instrument that was administered in the summer of 2007 to graduate students in a variety of disciplines at four institutions in the United States and Canada. Interesting to note that all of the courses in which the survey participants were enrolled were

designed and delivered using the CoI framework. The article discusses the general framework and the context of the study. It further explains in detail the psychometric analysis to validate the instrument giving a table of factor analysis for three specific factors, each representing the three presences, each yielding Cronbach's Alpha of 0.91 and higher. The factor analysis, it was concluded, provided evidence for the assertion that the online community of inquiry emerges out of social, cognitive, and teaching presence as described in the model. It is further asserted that the measurement tool of this study is statistically validated as a measurement tool to be used for further studies of the model. Researchers (Swan et al., 2008) also claim the tool "may also be used for practical purposes, to guide design elements ahead of time, or to evaluate the existence of an online community of inquiry once implemented" (p. 8).

Bangert (2008) conducted a qualitative study on the influence of social and teaching presences in an online discussion portion of a graduate-level educational statistics course. Bangert recognizes the Garrison et al. (2000) CoI model as "one of the most widely cited and recommended models for guiding the design and delivery of online instruction" (p.44) and noted a considerable amount of research had been conducted on the three individual presence, however, few studies investigated the three presences interact simultaneously in an online course. This study sets out to discover the relationships between these presences. Thirty-three graduate students were randomly selected to be in three separate groups who interacted online in a graduate level course. Three groups were a control group, social presence, and social presence combined with teaching presence. Each group was assigned to discuss the same problem-based learning task. The control groups were given instructions on how to accomplish the problem-based learning (PBL) task and were given two weeks to complete it individually. Both the social presence and the social presence combined with teaching presence groups were first given two-

weeks of team building activities and were given time to confer and discuss amongst themselves how the group was going to accomplish the PBL task as a group effort. The teacher, also the author of the article, restrained from any interaction or guidance for this group save basic instructions and clarification of the task with the social presence group while actively participating and guiding the discussion in the other group. An analysis of the data was conducted by two trained coders using Garrison's (2001) four-phases of cognitive presence. The coders agreed on designations of the one hundred and thirteen messages between all three groups. The researcher concluded that the social presence combined with the teaching presence group had more messages that coded in a higher cognitive presence that suggested the teaching presence influenced ongoing opportunities for deep levels of inquiry for the students.

Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, and Swan, (2008) did a study with the intention of validating a new 34-item survey instrument of students' perceptions of a course designed using the CoI framework. This multinational, multi-institutional research project collected survey results from 287 students. The article reveals details on the factor analysis performed to validate the newly developed instrument. It was noted that cognitive and social presence items were considered strong and valid for research purposes. Teaching presence items were considered valid although results were not as strong. The researchers recommend that items used to measure teaching presence "may need to be refined" (Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, & Swan, 2008, p.136). The researchers point out factors that can influence students' perceptions of teaching presence and recommend further research to refine the instrument.

Rourke and Kanuka (2009) embarked on a study that reviewed 252 reports published from 2000 – 2008 that reference CoI and analyzed them from the perspective of student learning.

The researchers acknowledge a breadth of work that explores the three presence and other aspects of the framework but claims very few studies have been done to examine the central claim of CoI, that the framework is a means to ensure quality student learning (Garrison, Anderson, & Archer, 2000). The researchers spend a great deal of time in this report on the foundation of the methodology for their mixed methods study. They note that only 5 of the 252 reports on previous research have learning as a primary focus of the study. Virtually evenly distributed amongst most studies concentrate on cognitive presence, social presence, and teaching presence as focus of study. The researchers provide a detailed list of studies and categorize them as empirical, theoretical, or review and note the focus of one of the three presences they investigate. Rourke and Kanuka (2009) make a distinction between perceived learning as “assessed with a single item on a closed-form survey” (p. 19) and brought into question, apparently for the first time since its inception, the soundness of measuring student learning and the validity of the instrument issues in CoI research in regard to this item on learning. More importantly, the researchers focused on the aim of the individual studies they reviewed and noted that previous studies may have taken note of the three presences and how they relate to one another with regard to student satisfaction but do not study the intended results of CoI as a tool to enhance online instruction with the goal to be deep and meaningful learning.

Rourke and Kanuka (2009) continue with their evisceration of CoI and remark on the instrument created to quantitatively study CoI, the instrument used by most of the 252 reports studied by these researchers. They note that the 4 or 5 studies that focused on learning had access to only one item in the factor for learning and can therefore not be a valid tool for measuring learning. They continue to note specific instruments that could be used to study higher order learning. They then go on to illuminate the lack of significant data that proves any cognitive

presence in the CoI according to the reports they studied. Their main suggestion for continued research is for more substantial studies of learning in CoI. That research can make evidenced-based connections to any of the three presences of CoI alone or in combination that are linked clearly to deep and meaningful learning. Finally, Rourke and Kanuka (2009) state, “Conceptual frameworks of social presence, teaching presence, and cognitive presence (and the corollary prescriptions for instructional designers) that are unconnected to empirical evidence of deep and meaningful learning are, on the face of it, groundless” (p. 44).

The very next issue of the same journal issued a response to the Rourke and Kanuka (2009) study by some of the major players in CoI creation and development (Akyol, Arbaugh, Cleveland-Innes, Garrison, Ice, Richardson, & Swan, 2009). Although this article is not an empirical research study, it does use an impressive amount of citations including going back to Dewey, the foundation for CoI. Not surprising, the authors of this article disagree with some of the fundamental claims of Rourke and Kanuka (2009) and focus their article on discrediting Rourke and Kanuka’s (2009) basic research. First, the authors make a clear distinction between learning processes and learning outcomes. They state immediately that Rourke and Kanuka (2009) central claim that CoI framework is focused on learning outcomes is “a serious misrepresentation of the CoI model” (p. 124) claiming that CoI does not leave out learning outcomes but it is about the “nature of the educational transaction” (p.124). The idea is that deep and meaningful learning is within a deep approach to learning as in the three elements of CoI.

Akyol et al. (2009) take a direct stab at the research of Rourke and Kanuka (2009) by correcting citations. They continue by choosing several studies referred to by Rourke and Kanuka (2009) and claim corrections to their citations and gleanings from the studies. The authors conclude with the points that they do agree upon with Rourke and Kanuka (2009) mostly

about the need for continued research. They further point out that CoI has enjoyed a great deal of use and has been credited with a number of studies validating the framework. The mere existence of the framework's research instrument has been an impetus for further research into online and blended learning. The authors conclude, "To suggest that the CoI is a failure as a program of research is misguided and unfair at best" (p. 131).

Boston, Diaz, Gibson, Ice, Richardson, and Swan, (2010) used the CoI instrument as a means to identify if there was any relationship between the indicators of CoI and student retention rates in online programs of study. The purpose was to see if student responses in the CoI survey (Swan et al., 2008) could be a predictor of student registration in the next semester. The study was of 28,877 undergraduates enrolled in an online for-profit university and that represented just 38.91% of all students enrolled. Students completed the 34-item survey developed by Swan, Richardson, Ice, Garrison, Cleveland-Innes, and Arbaugh (2008) and the results were compared to the university enrollment data of students who enrolled in the subsequent semester. The researchers concluded that given the large sample size and the results, further study of the impact two specific Social Presence items was warranted. As the researchers put it, "Responses to CoI item # 16 (Online or web-based communication is an excellent medium for social interaction) account for over 18% of the variance associated with whether a student returned to studies in the semester subsequent to completing the survey. This is, simply stated, a remarkable finding, especially in light of the sample size obtained" (p.11). The researchers do not make generalizations about online learning using the study's results. Given this study was conducted at a fully online university, it may not be an adequate indicator of the experiences of all online students and courses as many are not at fully online universities. They also suggest that how students interact with one another has changed in recent years and that attention to how

institutions encourage this interaction is important. The researchers suggest further studies be made that might indicate if there is any impact on retention with regard to Teaching Presence.

Shea and Bidjerano (2010) conducted a study of 3165 students across 42 two-year and four-year higher learning institutions. They examined the relationship between student ratings of their own learning in an online environment and learner self-efficacy. They also explored these relationships within blended vs. fully online courses. The authors use this study to construct the idea of expanding CoI to include self-efficacy and self-regulation as key factors in student experiences and learning. Shea and Bidjerano (2010) present a literature review of CoI, self-regulated learning, and self-efficacy.

The CoI instrument was used to ascertain student perceptions about the quality of their online education. Self-efficacy and effort regulation was measured using a 12-item instrument. The researchers give details of the analysis of the instruments for item validity and the analysis of the data collected. The researchers concluded that the reasons for students' success in online courses could influence the development of the instructional design of these courses. The researchers' emphasis "self-regulation can serve as the basis for a new form of "presence" within the model (p. 1727) and create a new presence they label as learning presence. They also note the importance of teaching presence with regard to self-efficacy. Students may not have a strong opinion about their abilities in online courses and designing more teacher-student interaction to bolster students' positive attitudes with regard to self-efficacy can have a significant impact on learning presence. Given their perspective based on this one study, the researchers recommend further research into motivational and self-regulatory factors in the online learning environment and how it can be further incorporated into the CoI framework.

Nagel & Kotzé (2010) employed a mixed method study of the use of CoI design in a large online class. The researchers explored if the available technologies and teaching strategies could compensate for predictable perceptions of students feeling disengaged from the instructor that might have a negative impact on perceived learning. The study examined the technology used in the course for feedback, peer review feedback and its perceived effects on learning, and the overall perception of students to the CoI design by utilizing the CoI survey. The researchers noted that the technology was not always reliably available to students given student access to computers and Internet access may have been limited. Those students that were able to reliably access and utilize the available technology (67% who completed the survey) reported it being useful. Students overwhelmingly reported (95%) positively about the peer review process and its usefulness in producing final written work. The researchers recommend further study of large online classes of varying sizes.

Annand (2011), citing Rourke and Kanuka (2009), looks specifically at social presence within CoI and asserts that CoI is inherently flawed. Annand (2011) challenges the basic assumption that there is a need for “contiguous, two-way communication in higher-level online learning environments” (p. 40) as it may not lead directly to deep and meaningful learning. The author questions where social presence is needed at all in the development of higher-order cognitive presences in higher education online learning. He continues to note that there is an indication in previous research that students themselves do not credit much value to group-based social presence as an influence on learning. Annand points to several other factors that influenced learning the most important being a course design which allowed problem-solving tasks so students could have a more meaningful social construct of knowledge. Annand’s (2011) main point is that the CoI “framework has evolved from a description of the learning process in a

social constructivist paradigm to an empirically testable construct within an objectivist paradigm” (50). He suggests that too much attention was given to social construct in the learning environment at the very foundation of the creation of the framework. The fundamental paradigm of CoI was constructed out of conference call transcripts and the original authors overemphasized the importance of the discussions. Annan suggests a reevaluation of CoI outside of a social constructivist learning theory to one more of an objectivist paradigm. A different perspective could be used in researching the influence of social presence in subcategories of social and teaching presence where group based activities versus individual activities could be reviewed.

Cleveland-Innes and Campbell (2012) embarked on a study to discover emotions present in an online learning environment and suggest an extension to CoI framework to include emotional presence. The researchers hypothesize that emotions can have an impact on online learning and may affect teachers and students in this domain. The very nature of the need to use and incorporate technology in an online learning environment may bring up emotions that can inhibit learning. It is acknowledged here that the originators of CoI included emotional expression as part of social presence. The first phase of the study was conducted with the evaluation of survey data and analysis of online asynchronous discussions of 217 student participants across 19 interdisciplinary courses. Forty-six percent (46%) of the students were first-time participants in an online course. Four raters analyzed the qualitative data independently. The researchers concluded there was evidence of emotional content present and moved to a second phase of the study. The second phase of the study used the CoI instrument with an additional 6 items included to measure emotion. Seventy-nine participants completed the survey.

The researchers conclude that emotion is present in online courses and that “emotion is experienced by online students in areas beyond the expression of social presence” (p.282). The researchers suggest that the nature of an online learning community demand role adjustments given students are not passive observers and participate in a more social role in community learning. They propose more research and analysis of emotions in CoI developed courses to help with an instructional design that will have students be prepared and adjust to their new role more effectively.

Lambert, Fisher, and Juenethia (2013) conducted a mixed methods case study of CoI to examine the existence of the three CoI presences in an online graduate-level technology online course. This study was conducted in a single semester to 15 graduate level students in the same online course at a United States Midwestern university. The authors describe the course design and implementation noting how particular attention was paid to each area of presence throughout the course via teacher presence influencing social and cognitive presences either by course design or scaffolding task accomplishments. The qualitative portion of the study used the CoI 34-item instrument. The course design and implementation scored well amongst the students’ surveyed in all three presences of the CoI framework. The qualitative portion of the study was gathered from blogs as supplemental to the quantitative data.

The authors acknowledge the pervasive use of online social communities such as Facebook and Twitter and note that students enjoy social communities. The researchers examined the level at which students report their enjoyment with the courses social community but note that students were not enjoying collaborative assignments. The researchers correlate collaborative assignments with the direct development of social communities and argue the issue might be one of the students’ inhibitions with freely communicating with each other. It is

suggested that different strategies be used for developing a social presence. The researchers recommend more research into the effects that technical skill proficiency has on students' ability to be fully engaged in the course content and expected engagements. They also suggest that future research of CoI be expanded from the investigation of text-based asynchronous online discussions to include other online interactions available for course delivery including personal wiki pages, video conferencing, and collaborative project work online presentations suggesting newer forms of technology provide a vast array of interacting possibilities for students and instructor.

The Oyarzun and Morrison (2013) study addressed student concerns about isolation in an online learning environment. Their premise was to include a cooperative learning strategy and see if it affected social presence and student achievement in an online course. The researchers preface their literature review, study methods, and results with a considerable introduction discussion the definition of community and collaboration as an instructional strategy. Their literature review was extensive with regard to these topics and also included CoI. The study was conducted on 34 students from two sections of the same course at a southeastern United States 4-year university. The sections were divided into two distinct populations of students, those that take all online courses, and those that had a combination of face-to-face (F2F) courses and online courses. Both sections courses were delivered asynchronously and fully online. The instrument used was a modified version of the CoI instrument that was intended to solicit perceptions about units of study rather than the entire course. It should be noted that the researchers include a validity scaling analysis based on the original CoI instrument as presented by the original instrument developers and not their own modified instrument. A second survey was used to

measure student satisfaction of learning. They do not specify where their reliability rating came from.

The researchers hypothesized that cooperative learning would increase learning satisfaction. They did not study levels of deep learning. The results indicate that there were no significant differences in achievement as students achieved the intended instructional outcomes regardless of instructional methods, individual work or cooperative work. The researchers note the limitations of their research including the few participants and that the cooperative learning unit was the only cooperative learning unit in the course and the last of eight units over the entire course.

Armellini and De Stefani (2016) conducted a qualitative study between 2007 through 2010 of 40 English language teachers in Uruguay who participated in online professional development programs. None of the 40 volunteers had ever been formally trained as teachers or previously had experience in an online or blended learning environment. Thirty-six of the volunteers described themselves as digitally literate. The paper suggests that social presence is rooted in teaching and cognitive presence and a suggestion is made to adjust the original CoI framework to include social presence this way. The study began in 2007 with a needs analysis that informed the course content and delivery. Internet access was improved over time. Three iterations of the course were performed in 2008, 2009, and 2010. The study focused on the interpretations of the participant-instructor and peer exchanges in the learning management system (LMS), Moodle. The authors provide a detailed analysis of the data sources and the indicators they used to code the content. The researchers also conducted informal interviews with the participants that they describe as “peer debriefing as a form of audit” (p. 1207).

The researchers Armellini and De Stefani (2016) do cite Rourke and Kanuka (2008) and Annand (2011) but clarify that social presence has since evolved since the original development of CoI. They acknowledge social presence is pervasive and has “embedding itself in teaching presence and cognitive presence, with implications for online and blended course design and delivery (p.1203). They also acknowledge that social presence is central to the construction of meaningful teaching and learning and online course construction and delivery. The researchers suggest a shift to the CoI framework be explored and more researched is necessary in order that it might add validity to their proposed new framework structure.

Kozan’s (2016) study is also a dissertation. The study set out to define cognitive load as a predictor in student course satisfaction as related to CoI using multiple regression analysis. This study was conducted with 103 participants in two eight-week online courses. The researcher describes cognitive load in great detail with references. A detailed description of the study and adjustments to the research question based on preliminary analysis is described in detail. Participants completed the CoI instrument, a perceived learning and satisfaction survey, and an instructor survey aimed at collecting demographic data about the instructors for the courses. The researcher concluded that there was a significant correlation to learner perceived learning and satisfaction. According to the researcher, cognitive and social presence could predict intrinsic load but teach presence could help calibrate intrinsic load and therefore not be a good predictor for this variable. However, only teacher presence turned out to be a significant predictor in extraneous load. The researcher continues that the findings are based on a small population and further research is warranted.

Olpak, Yagci, and Basarmak (2016) set out to study the impact of CoI research on current online learning trends and it’s pervasiveness across disciplines and internationally. This paper is

an analysis of the development of the original CoI scale instrument and its subsequent development into the 34-item instrument through a massive literature review. The lengthy discussion goes through a great deal of published writing highlighting several significant studies and the impact they had on the development of the final 34-item instrument. The discussion includes most of the studies included in this paper. The researchers point out further that CoI as a concept and the instrument for evaluation of courses has become pervasive translations into Turkish, Korean, and Arabic and by citing studies from around the world. The second phase of the study included noting the subsequent development of data collection tools that are expansions or additions to the 34-item CoI instrument although no single instrument has been used more than any other to the date of publication. The researchers suggest new instrument additions be translated into a variety of languages for future study.

Watson, Watson, Richardson, and Loizzo (2016) performed a qualitative case study on one instructor's use of a transformed version of the CoI model to include dissonance for attitudinal change given the course was designed to promote attitudinal change. The course was a massive open online course (MOOC) on Human Trafficking delivered in four weeks to 30,207 registered learners from 186 countries. Data collection was from the online discussion posts and a sixty-minute review session with the instructor using semi-structured open-ended questions. Questions were focused on the instructor's experiences, intentions, and perceptions about this particular MOOC. The researchers discuss the intended difference in course design of this particular MOOC. Where other MOOCs may have little interaction between participants, this course was shifted using the CoI framework to encourage social community and cognitive presence through teacher presence. This was done because the study was designed to understand attitude changes specifically in this MOOC. The researchers acknowledge that social presence

may be harder to achieve given the massive numbers of participants. They also note that teaching presence may be more than just the traditional teacher as, in a course of this size, peers can take on this role and participate in influencing this presence. The results of the study showed that the MOOC refocused instructional strategies to establish a collaborative community of learners and in doing so may have helped in the attitudinal changes noted in the analysis. Learners were reliable for assessing each other's work and responding to discussion posts. These were deliberate changes structure of video instruction and instructor-centered approach traditionally found in MOOCs. The researchers assert that different instructional strategic approached to MOOCs such as CoI used in this course can impact learning outcomes.

Stenbom, S., Jansson, M., Hulkko, A. (2016) conducted an exploratory case study of the interactions between teachers and students in an online on-demand digital coaching environment to examine the three CoI presences and the newly suggested emotional presence with the intention to explore possibilities for one-to-one online coaching. The researchers coded transcripts of 3109 instant messages and 60 conversations between teachers and the students in an online environment called Math Coach. This software allows students to interact with a coach via instant text messaging and a shared digital whiteboard. The researchers found that all four presences existed in the discourse in this digital environment. They found that cognitive and teaching presence was more prominent than social and emotional presences. The researcher noted that given the prearranged structure of the software, with regard to teaching presence, there was, as expected, less emphasis in the data on these items as other areas of teaching presence. They were surprised to find so much direct instruction occurring as opposed to facilitation and recommend a slight change in the teacher/coach's approach be more facilitation rather than directive. The researchers found almost a complete absence of emotional presence. The

researchers recommend further research to explore the students' self-regulation and metacognition.

Discussion

The CoI framework has enjoyed a great deal of exposure, testing, study, revisions, and suggested additions over its seventeen-year history. The original study that produced CoI was by Garrison, Anderson, & Archer (2000). It may be that this study would not have had any impact if subsequent studies were not performed nor produced promising results. The creation of a quantitative instrument that could be used to research student perceptions of cognitive, social, and teaching presences within a course created using CoI as a framework was established with a validation study of the instrument by Garrison, Cleveland-Innes, and Fung (2004). Having an instrument for study may have contributed to the seemingly increasing interest in designing and implementing courses using the CoI framework as the instrument could be used not only as a tool for publishable research but assessment of the course design. Continued research and articles lead to the development of a new 34-item instrument (Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, & Swan, 2008). Although the researchers admit the item was not perfect, the mere admission to this and suggestion for further research for clarification and refinement may have contributed to the continued research CoI has enjoyed.

Researcher infighting continued the conversation about the validity of CoI as an online course design framework and its survey instrument. Rourke and Kanuka (2009) begin a public discussion of the validity of CoI with an immediate response from Akyol, Arbaugh, Cleveland-Innes, Garrison, Ice, Richardson, and Swan (2009). Annand's (2011) article questioning the fundamental validity of CoI as a framework toward increasing student learning outcomes and the use of the instrument to measure student learning continued the argument. It should be noted that

Annand's article was published in a university journal of the very university that the CoI researchers worked and developed their theory. An response was posted by Garrison (2011) on the CoI website, also a publication of the very same university they all work in, but was not included in this paper as it was not published in a peer viewed journal.

Proposed Research

The Community of Inquiry framework and research instrument has been used in a variety of high education institutions for an array of content areas all around the world (Olpak, Yagci, & Basarmak, 2016). It is considered "becoming an essential guide to research and practice in online education" (Armellini & De Stefani, 2016, p. 1202). The research to extract research and seminal works on the subject of CoI has revealed there are few studies that involve high school students. A research project to better understand best practices for on effective design and delivery of a course being presented through an LMS using the Community of Inquiry (CoI) framework for high school students would be advised, more specifically, the social and emotional presence as exemplified through the online asynchronous discussions.

The research questions would revolve around the specifics of the CoI framework to explore efficacy in the course design and delivery. Given this might be the first time the designer and instructor might utilize CoI in a high school blended learning course, exploring the students' response to the design and delivery utilizing this model would be an exploratory first step in the research. Research question would be:

1. To what extent are students satisfied with the integration of online discourse?
2. How does the integration of asynchronous online discussion increase student satisfaction with the blended experience?

3. To what extent are students comfortable participating in an asynchronous online discussion?

Methodology

A mixed methods case study of a class or classes using the newly designed blended learning via CoI design could be conducted. Permissions from the district, parents/guardians, and students would need to be obtained to embark on the study. Students would be asked to voluntarily complete the CoI research instrument that included the extended questions incorporating emotional presence (Cleveland-Innes & Campbell, 2012). This is a quantitative instrument that has 34 items that use a five-point Likert-type scale. A review of the discussions forums could be conducted and analyzed as in several other previous research studies. This would require at least two independent coders to validate the coding process before formal analysis of the collected and coded data could be reviewed.

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