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An Investigation of Student Perceptions of Community of Inquiry Presences in Community College Online Education and General Education Courses: A Descriptive Study

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Abstract

Effective pedagogical practices are critical to the success of online post-secondary education students. The purpose of this study was to investigate community college student's perceptions of the Community of Inquiry (CoI) presences in two online course types, those being (a) a major-specific course and (b) a GenEd course. The CoI questionnaire was used for data collection. Correlation analysis and linear regression were used to model the relationship between the predictive variables of teaching and social presences, and their sub-constructs, to the outcome variable of cognitive presence, and then associated with a set of pedagogical practices. The findings suggest a predictive relationship exists between the predictor variables and cognitive presence, with minor differences between course types. The paper concludes with a discussion of the determined regression model and its relationship to the implemented pedagogical benchmarks. A graphic is provided depicting the influential associations to the cognitive presence within the CoI Framework.

Keywords: cognitive presence, Community of Inquiry, online postsecondary education, online pedagogy, social presence, teaching presence

AN INVESTIGATION OF STUDENT PERCEPTIONS OF COMMUNITY OF INQUIRY PRESENCES IN COMMUNITY COLLEGE ONLINE EDUCATION AND GENERAL EDUCATION COURSES: A DESCRIPTIVE STUDY

1.0 Student attitudes, motivations and levels of engagement are of great interest to teachers, professors, educational leaders, policy makers and instructional designers. With positive attitudes and the right level of motivation and engagement, cognitive engagement can occur that results in a meaningful learning experience. Learning experiences are not all the same, nor should they be. Two factors that influence the learning that occurs in higher education is the method of delivery of a course and the level or type of a course a student may be enrolled in. For purposes of this study, two types of online courses offered at a community college were examined. One type of course being an introductory general education course and the other being a major specific course. Given that introductory *general education*(GenEd) courses are usually comprised of students from a wide variety of majors and a *major-specific* course is more likely to have students with similar characteristics, the most

effective online instructional strategies for each may not be the same. It is a possibility that student perceptions of the online learning environment may differ when enrolled in a course that focuses on their future career, rather than general education. If true, instructors may need to employ different instructional strategies between these course types to most effectively engage online students.

The Community of Inquiry (CoI) framework(Garrison, D., Anderson, T., & Archer, 2000; Garrison, R., Cleveland-Innes, M., & Vaughan, 2016)is the theoretical framework that guided this study. Its associated questionnaire, the CoI questionnaire, a validated measurement instrument of the CoI presences(Arbaugh et al., 2008), was used to assess students' experience in each type of course. The GenEd course being a themed course for first year college students titled Connecting with Ideas and the major specific course being an education course for education majors titled Foundations of Education. Created in 2000, the CoI framework is one of the most widely referenced frameworks associated with web-based and hybrid scholarly research. It was created by a team of Canadian researchers; Garrison, Anderson and Archer. It is grounded in social constructivist principles and John Dewey's 1938 notion of practical inquiry. The phrase 'community of inquiry' is borrowed from Matthew Lipman's book 'Thinking in Education.'

The CoI environment is non-tangible, it represents the learning environment that students and instructor create during an online course. The CoI's three overlapping presences are illustrated in Figure 1.
This image shows how the attributes of each of the presences ultimately culminate to produce the educational experience as represented by the overlapping area of the three presences. The CoI framework and questionnaire have articulated elements, validated relationships and indicators.

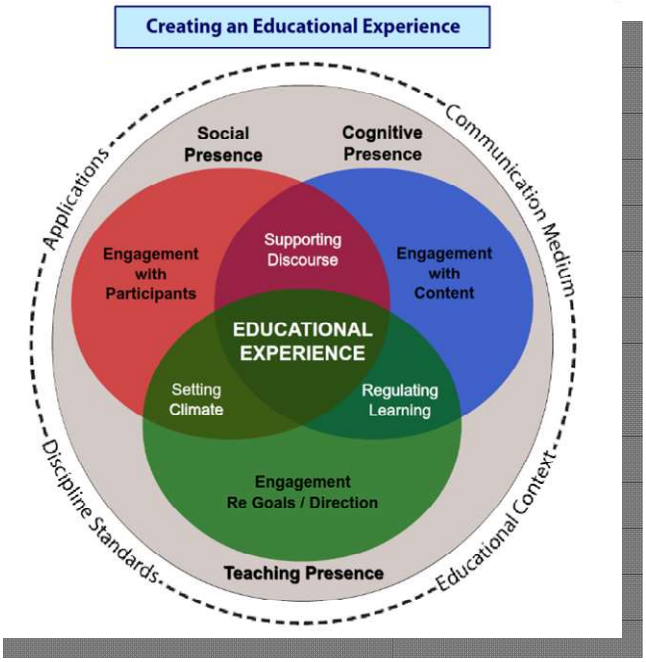

Figure 1: Graphical interpretation of the current CoI theoretical framework (Garrison, Cleveland-Innes, & Vaughan, 2016)

2.0 PROBLEM

It is more and more common for higher education faculty to teach online. There were 6,359,121 students enrolled in at least one distance education course during Fall 2016, a 6% increase from the previous year. A review of recent trends found that enrollment in distance education courses has increased 26% in 2012, 27% in 2013, 28% in 2014 and 30% in 2015 (Seaman et al., 2018). The increase is present across the various forms of postsecondary educational institutions, including community colleges.

Community colleges have experienced a dramatic increase in online course enrollment (Shaw & Witt, 2015). As the faculty of these institutions learn to develop and teach different types of courses online, it is logical to question whether there is a need for different approaches to online teaching based on the type of course taught. A review of literature has found scant articles describing studies that investigated best practice differences for online pedagogy between teaching a GenEd course and teaching a major-specific course. Maximizing the student learning experience for each course type may require enhancing different aspects of online pedagogy. The CoI framework and questionnaire provides researchers a tool to assist in the development of an understanding of the online student learning experience. The CoI framework proposes that the overlapping intersection of the CoI presences forms the core of the online student learning experience (Szeto, 2015). Through the CoI framework, one can investigate how students experience teaching presence, social presence, and cognitive presence, and their sub-presences, within the online learning environment, and use the findings to improve pedagogical practices. While CoI research has addressed many settings, CoI research specifically evaluating the CoI presences as experienced in an online GenEd course, in contrast to a major-specific online course is needed(Arbaugh et al., 2010; Bolliger et al., 2013; Garrison & Arbaugh, 2007; Kozan & Caskurlu, 2018).

3.0 PURPOSE& RATIONALE

The purpose of this quantitative comparative study was to investigatethe relationship between specific CoI presences as experienced by online community college students enrolled in either a major-specific course in the discipline of education or in a freshmen orientation general education (GenEd) course. The specific relationship of interest and focus of this study is that of the relationship between the two CoI presences of teaching presence and social presence, and their sub-constructs, to that of the cognitive presence. Garrison, et al. (2000)indicated that the cognitive presence is the element that is "most basic to success in higher education" (p. 89). However, the teaching presence and social presence are most able to be controlled or manipulated by a course instructor. Arguably, the most important goal of instruction is cognitive engagement that results in learning, and therefore the cognitive presence. Consider though, that cognitive engagement is not something an instructor can directly control. Theoretically, the instructor does have some control over the teaching presence and social presence, and by manipulating the factors of these presences, they may be able to increase the level of cognitive engagement and learning that occurs.

4.0 PEDAGOGICAL BENCHMARKS

The two types of online courses examined for this study were a freshman orientation general education course and a major-specific course in the discipline of education. The same instructor taught all sections of these courses that were included within this study. A common set of pedagogical practices were used for instruction. These practices included direct instruction using video, student collaboration, assessment communication techniques, and temporal communication.

4.1 DIRECT INSTRUCTION USING VIDEO

The course lessons involved screencast recorded lectures from the instructor. With a PowerPoint to guide the lecture, the instructor discussed key topics in each content area. Personal teaching anecdotes from real-life experiences as a public-school teacher supplemented the information provided by the course textbook and other source material. In addition, the Blackboard Learn navigational tutorial, course syllabus, course calendar and assignments were introduced using instructor-developed screencast videos. Complex assignments required additional screencast tutorials to explain expectations and review exemplary submissions from prior semesters.

4.2 STUDENT COLLABORATION

Students were encouraged to work collaboratively using the Wiki tool in Blackboard Learn. The Wiki tool enables students to add text to the same word processing document (online) seamlessly. Often these wikis were used to gather and create comprehensive resource lists focused on a specific topic.

4.3 ASSESSMENT COMMUNICATION TECHNIQUES

The instructor provided assessment feedback to students within Blackboard Learn. Most comments were narrative in nature. Edits and suggestions to the signature writing assignment for each course were extensive. Feedback included organization of ideas, depth of response to the prompt, editing to correct grammar and punctuation, and revisions to adhere to APA format. The instructor used a software tool called Type It In (https://www.wavget.com/typeitin/) to assist with providing student feedback. The tool enables instructors to assign text, with links to information or videos, to a button. When grading, the use of Type It In assists the instructor in providing comprehensive, consistent advice, which can include links to pre-recorded screencast tutorial videos. In many cases, the instructor used these tutorials to address common errors or provide step-by-step guidance for technical challenges.

4.4 TEMPORAL COMMUNICATION

Student questions were submitted primarily via email and usually responded to within an hour if received between 7am and 9pm weekdays, and within 12 hours when received on the weekends. Complex responses were explained in a personal recorded screencast, with the instructor showing a document or web page to answer the student's question.

Grading was completed in one to four weeks after assignment due dates. Students were then required to submit questions or responses to grading points or feedback within two weeks of the assignment feedback and points being posted to Blackboard Learn.

In addition to using traditional communication methods such as the telephone or email, Zoom meeting software (http://www.zoom.us) was used to facilitate online meetings between the instructor and students. Flexibility was provided and evening meetings were made available by appointment.

5.0 RESEARCH QUESTIONS & HYPOTHESES

The guiding research question for the study was; How do community college students enrolled in either an online freshmen orientation general education (GenEd) course or an online major-specific course perceive the relationship between the CoI teaching presence and the CoI social presence to that of the CoI cognitive presence?

In addition to an analysis of the descriptive statistics representing the CoI presences, the following hypotheses were investigated and the null version of them analyzed through statistical procedures in order to further inform the findings from the study.

- H_{a1}: Significant correlations exist between the CoI framework's teaching presence and cognitive presence, and, between social presence and cognitive presence within the major-specific group and within the GenEdgroup.
- H_{a2}:Teaching presence and social presence, as defined by the Community of Inquiry (CoI) framework, are significant predictive variables for the CoI cognitive presence within the major-specific group and within the GenEd group.
- H_{a3}:The sub-constructs of the teaching presence and social presences, as defined by the Community of Inquiry (CoI) framework, are significant predictive variables for the CoI cognitive presence within the major specific group and within the GenEd group.

6.0 METHODS

This exploratory comparative descriptive study aimed to investigate community college student's experience of CoI presences in two different online course types, one type being a major-specific course and the other type being a GenEd course. Participating students were surveyed, and the data collected was then screened and analyzed. Descriptive statistics were tabulated, and correlational-predictive data analysis was conducted. Correlation and regression techniques were used to examine the association of the CoI presences of teaching and social, and their sub-constructs, to that of the cognitive presence for both the major specific group and the GenEd group. Significant findings were then examined and aligned to pedagogical benchmarks, as defined by indicators established in previous research.

6.1 POPULATION & SAMPLING

The theoretical population of interest for this study wascommunity college students enrolled in online GenEdcourses and community college students enrolled in major specific courses in education. The institution that the study participants attended was fast growing community college located in a western state. Quantitative data was gathered using non-probability, purposive sampling methods. The census survey methodology spanned six semesters. Participants were students enrolled in online courses taught by the same instructor during Fall 2015, Spring 2016, Spring, Summer and Fall 2017, and Spring 2018 semesters.No students were enrolled in both course types; each group was a unique set of students.

6.2 INSTRUMENT

The 34-item CoI questionnaire(Arbaugh et al., 2008; Bangert, 2009; Swan et al., 2008)is a validated instrument designed to measure online student's experience of the CoI presences and their sub-presences. The questionnaire presents a five-point Likert response scale (1 = strongly disagree to 5 = strongly agree) to gaugestudents' perception of the CoI framework's cognitive, social and teaching presences and their associated sub-constructs. The theoretical structure of the CoI framework has been verified by factor analysis demonstrating the clustering of sub-elements within the CoI model (Arbaugh et al., 2008; Kozan & Richardson, 2014a, 2014b)

6.3 PROCEDURES

The same instructor using common pedagogical benchmarks taught each of the courses included within this study through online asynchronous methods. The courses were taught each fall and spring semester from Fall 2015 through Spring 2018. Prior to data collection, the study was reviewed for human subject compliance by the

institutional review board, who certified the study as exempt. All students enrolled in the identified courses were invited to participate in the study and complete the online 34-item CoI questionnaire. The invitation was communicated via an email message and announcement through the Blackboard Learn course management system during the last two weeks of each semester the study addressed. A second reminder email and announcement were sent a week after the initial request, at the start of finals week.

Following data collection, the data set was screened for missing data and other errors/anomalies. Once a clean data set was established, the CoI constructs were analyzed for each group of students. Descriptive statistics were tabulated and correlations coefficients between CoI constructs were calculated. In addition, the sub-constructs of each CoI construct were studied. Each of the three CoI constructs have three to four sub-constructs. Linear regression techniques were used to determine the strength and significance of the associations between the sub-constructs of the teaching presence and social presence to the cognitive presence.

7.0 RESULTS

All students enrolled in sections of a major specific course in education, and all students enrolled sections of a GenEd course, all taught by the same instructor, were invited to participate in thestudy. The major-specific courses had a total enrollment of 145 students, with a survey response rate of 30% (n = 42). The GenEd courses had total enrollment of 236, with a survey response rate of 21% (n = 50).

7.1 DEMOGRAPHICS AND BACKGROUND CHARACTERISTICS

The overall combined usable dataset (n = 92) included 42 students from the major-specific class (17% male, 83% female) and 50 students from the GenEd course (35% male, 65% female).All participating students were between the ages of 18 and 54. The largest group were between the ages of 18 and 25 for both types of classes.The vast majority, approximately 90%, were between the ages of 18 and 44. Most participants were Caucasian (see Table 1).

Table 1
Demographic Variables for Major-specific and GenEd Participants

Variable	Major-specific		GenEd	
	N	%	*n*	%
Gender				
Female	34	82.9	32	65.3
Male	7	17.1	17	34.7
Age (years)				
18 to 25	23	54.8	22	44.9
26 to 34	9	21.4	15	30.6
35 to 44	9	21.4	7	14.3
45 to 54	1	2.4	4	8.2
55 or older	0	0.0	1	2.0
Ethnicity				
Hispanic or Latino	5	11.9	3	6.1
Caucasian	32	76.2	33	67.3
African American	1	2.4	3	6.1
Asian	2	4.8	5	10.2
American Indian	1	2.4	1	2.0
Pacific Islander	0	0.0	1	2.0
Decline to state	1	2.4	3	6.1

7.1.1 MAJORS.MOST PARTICIPANTS WITHIN THE MAJOR-SPECIFIC COURSE IN EDUCATION WERE EDUCATION MAJORS (74%), WITH THE SINGLE LARGEST GROUP IDENTIFYING AS ELEMENTARY EDUCATION MAJORS (43%). THE MAJORS REPRESENTED IN THE GENED COURSE WERE MORE DIVERSE THAN THOSE IN THE MAJOR-SPECIFIC COURSE, WITH THE THREE MAJORS REPRESENTED THE MOST BEING BUSINESS (16%), LIBERAL ARTS (16%) AND UNDECIDED (16%).

FOLLOWING THAT WERE NURSING AT 12%, BIOLOGY AT 10% AND PSYCHOLOGY AT EIGHT PERCENT.

7.1.2 ACADEMIC EXPERIENCE AND TECHNOLOGY LITERACY.THIRTY-EIGHT PARTICIPANTS (91%) WITHIN THE MAJOR-SPECIFIC GROUP STATED THEY DID NOT RECEIVE TRAINING PRIOR TO TAKING THE ONLINE COURSE, AS COMPARED TO 76% OF THE GENED GROUP. WHILE MORE THAN HALF OF THE MAJOR-SPECIFIC STUDENTS HAD COMPLETED THREE OR MORE ONLINE COURSES, 42% OF THE GENED STUDENTS REPORT THIS WAS THEIR FIRST ONLINE COURSE. MOST OF THE MAJOR-SPECIFIC PARTICIPANTS WERE IN THEIR SECOND OR SUBSEQUENT YEAR OF COLLEGE. APPROXIMATELY 95% OF THE MAJOR-SPECIFIC GROUP, AND 90% OF THE GENED GROUPINDICATED THEIR COMPUTER LITERACY WAS AVERAGE OR HIGHER THAN AVERAGE (SEE TABLE 2).

Table 2

Academic Experience and Background Characteristics of the Study Participants

Variable	Major-specific		GenEd	
	N	%	*n*	%
Online Course Training (hours)				
No training	38	90.5	38	76.0
1 to 4	4	9.5	6	12.0
4 or more	0	0.0	6	12.0
Online Learning Experience (online courses completed)				
First online course	3	7.1	21	42.0
1 to 2	6	14.3	9	18.0
3 to 5	19	45.2	9	18.0
5 or more	14	33.3	11	22.0
Semester in College				
First	3	7.1	24	48
Second	12	28.6	9	18
3 to 4 (2nd year)	17	40.5	11	22
5 to 6 (3rd year)	6	14.3	1	2
6 or more	4	9.5	5	10
Computer Literacy Skills				
Above average	6	14.3	18	36.0
Average	34	81.0	27	54.0
Below average	2	4.8	5	10.0

7.2 RESEARCH QUESTION: HOW DO COMMUNITY COLLEGE STUDENTS ENROLLED IN EITHER AN ONLINE FRESHMEN ORIENTATION GENERAL EDUCATION (GENED) COURSE OR AN ONLINE MAJOR-SPECIFIC COURSE PERCEIVE THE RELATIONSHIP BETWEEN THE COI TEACHING PRESENCE AND THE COI SOCIAL PRESENCE TO THAT OF THE COI COGNITIVE PRESENCE?

The descriptive statistics for the CoI constructs of cognitive presence, social presence and teaching presence for major-specific and Gene course participants are summarized in Table 3. The means of all three presences were similar, which is consistent with the findings of previous research(Garrison et al., 2010; Kozan & Richardson, 2014a; Shea et al., 2011; Shea & Bidjerano, 2009). The teaching presence had the highest mean and the social presence had the lowest mean within both groups.

Table 3
Descriptive Statistics of CoI Constructs for Major-specific and GenEd Participants

Variable	Major-specific					GenEd				
	n	*M*	*SD*	Min	Max	*n*	*M*	*SD*	Min	Max
Cognitive Presence	42	4.39	0.68	2.50	5.00	50	4.03	.88	1.25	5.00
Social Presence	42	4.21	0.72	1.78	5.00	50	3.78	.88	2.00	5.00
Teaching Presence	42	4.65	0.52	2.85	5.00	50	4.23	.91	1.46	5.00

Each of the CoI presences is composed of 3-4 sub-constructs. The descriptive statistics for the CoI sub-constructs for cognitive presence, social presence and teaching presence within each group are summarized in Table 4. The means of all 10 sub-constructs were similar across the two groups, with the GenEd sample generating lower means for all sub-constructs. The teaching presence sub-construct design and organization had the highest mean for both groups. Conversely, the social presence sub-construct affective expression had the lowest mean for both groups.

Table 4
Descriptive Statistics of CoI Sub-constructs for All Participants

Variable	Major-specific					GenEd				
	n	*M*	*SD*	Min	Max	*n*	*M*	*SD*	Min	Max
Cognitive: Triggering Event	42	4.36	0.78	2.00	5	50	3.87	1.04	1.00	5
Cognitive: Exploration	41	4.28	0.76	1.67	5	50	3.85	1.04	1.00	5
Cognitive: Integration	42	4.56	0.59	3.00	5	50	4.12	0.94	1.00	5
Cognitive: Resolution	42	4.41	0.77	2.00	5	50	4.26	0.79	2.00	5
Social: Affective Expression	42	3.89	0.92	1.33	5	50	3.23	1.19	1.33	5
Social: Open Communication	42	4.50	0.71	2.00	5	50	4.25	0.87	2.00	5
Social: Group Cohesion	42	4.25	0.81	2.00	5	50	3.87	0.92	2.00	5
Teaching: Design & Organization	42	4.77	0.51	3.00	5	50	4.32	0.97	1.25	5
Teaching: Facilitation	42	4.58	0.58	2.67	5	50	4.17	0.92	1.33	5
Teaching: Direct Instruction	42	4.63	0.62	3.00	5	50	4.25	0.97	1.00	5

In addition to a review of the descriptive statistics for the variables and groups involved in the study, each of the supporting hypotheses were tested using statistical procedures. The findings from these tests are described and summarized within the following narrative.

7.2.1 H_{a1} Findings. A Pearson product-moment correlation coefficient was calculated for each of the paired associations between CoI constructs within each group of students. Of interest for this study was the evaluation of the coefficients to determine if the teaching presence and social presence are associated with the cognitive presence in both major-specific ($n = 42$) and GenEd ($n = 50$) groups.

Within the major-specific group, analysis showed a significant, strong positive correlation between the teaching presence ($M = 4.65$, $SD = 0.52$) and the cognitive presence ($M = 4.39$, $SD = 0.68$), $r(40) = .759$, $p < .001$. Higher levels of perceived teaching presence are associated with higher levels of perceived cognitive presence in the major-specific sample.

The GenEd group also showed a significant, strong positive correlation between the teaching presence ($M = 4.23$, $SD = 0.91$) and the cognitive presence ($M = 4.03$, $SD = 0.88$), $r(48) = .81$, $p < .001$. Higher levels of perceived teaching presence are associated with higher levels of cognitive presence in the GenEd sample.

For the major-specific group, the social presence ($M = 4.21$, $SD = .72$) demonstrated a significant, strong positive correlation to the cognitive presence ($M = 4.39$, $SD = 0.68$), $r(40) = .76$, $p < .001$. Higher levels of perceived social presence are associated with higher levels of perceived cognitive presence for the major-specific sample.

The social presence ($M = 3.78$, $SD = 0.88$) demonstrated an equally significant, strong positive correlation to the cognitive presence within the GenEd sample ($M = 4.03$, $SD = 0.88$), $r(48) = .80$, $p < .001$. Higher levels of perceived social presence are associated with higher levels of perceived cognitive presence for the GenEd participants.

7.2.2 H_{a2} Findings. Multiple linear regression is a statistical analysis method that models the relationship between variables, allowing the strength of the associations and the predictive ability between them to be examined (Bruce & Bruce, 2017; Cronk, 2020). As shown in Table 5, a multiple linear regression model using the social and teaching presences as the possible predictor variables and the cognitive presence as the dependent or outcome variable was generated for each group. The determined model for the major-specific group indicated that teaching presence and social presence together explained approximately 68% of the variability of the cognitive presence, $F(2, 39) = 42.25$, $p < .001$, $R^2 = .68$. The model is represented as: Cognitive Presence = -.09 + .42 (Social Presence) + .58 (Teaching Presence).

For the GenEd group, the determined regression model indicated the teaching and social presences explained approximately 76% of the variability of the cognitive presence, $F(1, 47) = 20.52$, $p < .001$, $R^2 = .76$. The model for the GenEd group is represented as: Cognitive Presence = .29 + .46 (Social Presence) + .47 (Teaching Presence) (see Table 5).

Table 5

Multiple Linear Regression: Teaching Presence and Social Presence as Predictors for Cognitive Presence for Groups

Variable	Major-specific				GenEd			
	B	Beta	T	*p*	β	Beta	T	*p*
Constant	-.092		-0.17	.867	.294		0.926	.359
Teaching Presence	.584	.452	3.66	.001	.468	.481	4.727	.000
Social Presence	.420	.450	3.65	.001	.464	.461	4.530	.000

7.2.3 H_{a3} Findings: In addition to examining the predictive association of the primary presences of teaching presence and social presence to cognitive presence, the predictive association of the sub-constructs for the teaching presences and cognitive presences were also analyzed. A multiple linear regression analysis conducted using the cognitive presence as the outcome variable and the social and teaching sub-constructs as possible predictor variables indicated the same two significant predictor variables for both class types. The variables were the teaching presence sub-construct of facilitation (major-specific: $M = 4.58$, $SD = .58$; GenEd: $M = 4.17$, $SD = .92$) and the social presence sub-construct of group cohesive (major-specific: $M = 4.25$, $SD = .81$; GenEd: $M = 3.87$, $SD = .92$).

The resulting regression model for the major-specificgroup was:cognitive presence = 0.15 + 0.61 (Teaching: Facilitation) + 0.34 (Social: Group Cohesive). For the GenEd group, the model was: cognitive presence = 0.41 + 0.58 (Teaching: Facilitation) + 0.31 (Social: Group Cohesive). R squared values indicated that the major-specific model explained 73% of the variance of the cognitive presence and that the GenEdmodel explained 75% of the variance of the cognitive presence.

8.0 DISCUSSION

The CoI literature clearly defines the teaching presence as the building block for the social presence and cognitive presence, as graphically represented by the teaching presence being placed below the other two, like a foundation, within the graphic representing the CoI framework. The social presence, in a similarway, is an influential factor that can affect the cognitive presence. The teaching presence and social presence are both areas that the instructor has some direct control over based on how the instructor structures and designs class assignments and activities. From an instructional standpoint, the cognitive presence is the CoI presence that the instructor has the least direct control of; yet may be of most interest.

Cognitive engagement of the learner is a primary purpose of instruction. Critical thinking, knowledge construction, and the ability to explore, understand, evaluateand synthesize complex conceptsoccurs within the cognitive presence of the CoI framework. This study, as well as previous studies, have shown the cognitive presence to be associated with the social and teaching presences. Although the previous studies were conducted in different contexts then the current study, like the current study, they also found the teaching and social presences to be significant predictors of the cognitive presence. Gutierrez-Santiuste et al.(2015) found that the teaching and social presences predicted 81% of the variability of the cognitive presence. Archibald(2010)reported that 69% of the variance in the cognitive presence is explained by social and teaching presence. Further supporting the

apparent association, Shea andBidjerano(2009)concluded that 70% of the variance in the cognitive presence is explained by social and teaching presence.

The findings from the current study have contributed to an understanding of how the CoI presences were perceived by online learners enrolled in a major-specific course, and online learners enrolled in a Gen Edcourse, in the community college setting. The findings provide insight into how the social and teaching presences are perceived and how they are associated with the cognitive presence. Multiple linear regression analyses showed the teaching presence and social presence were significant predictors of the cognitive presence for both course types. For each, a large amount of the variability of the cognitive presence could be predicted through the determined regression models (68% for the major-specific group; 76% for the GenEd group). This finding provides guidance to online instructors who may seek to focus their efforts on the teaching and social presences, knowing that by increasing these presences, they will also be positively affecting the cognitive presence.

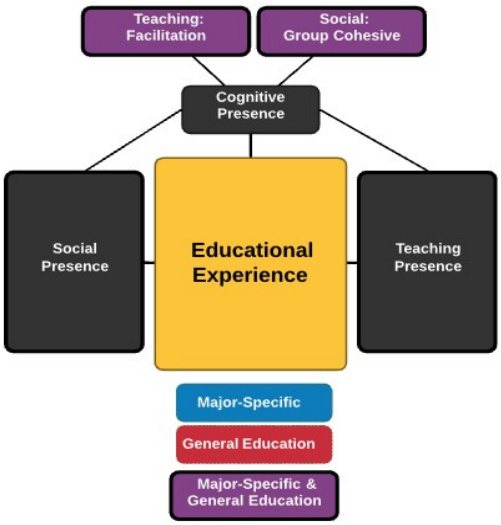

Figure 2: A partial model of the most influential associations within the CoI Framework.

Understanding that the cognitive presence may be changed by affecting the teaching presence and social presence is helpful to course designers and instructors, but further analysis of the sub-constructs of the teaching presence and social presence adds clarity to the interpretation and application of the findings. The findings from this study have shown the same two significant predictors of the cognitive presence for both the GenEd and Major groups, these being the teaching presence sub-construct of facilitation and the social presence sub-construct of group cohesive (see Figure 2).A modest interaction between teaching method and group type was observed, where the benefits of the identified pedagogical practices are more pronounced within the major-specific group then for the GenEd group. However, because the findings for the major-specificgroup and the GenEdgroup resulted in the identification of the same two predictors for the cognitive presence, instructional choices to enhance the cognitive presence could be similar for both groups.

With this knowledge, one can consider how various instructional techniques may be used to maximize the creation and maintenance of an effective online learning environment. Garrison and his colleagues identified and aligned pedagogical indicators with each of the CoI sub-constructs (see Table 6).

Table 6
Indicators associated with the CoI constructs and sub-constructs
(Garrison et al., 2000; Garrison & Arbaugh, 2007; Garrison, 2007; Garrison, 2016)

CoI Presence	Sub-construct	Indicators
Social	Effective Expression	Emoticons
	Open Communication	Risk-free expression
	Group Cohesion	Encourage Collaboration
Cognitive	Triggering Event	Sense of Puzzlement
	Exploration	Information Exchange
	Integration	Connecting Ideas
	Resolution	Apply New Ideas
Teaching	Design & Organization	Setting Curriculum & Methods
	Facilitation	Sharing Personal Meaning
	Direct Instruction	Focusing Discussion

The teaching presence sub-construct of facilitation is created by instructor actions to maintain the interest, motivation, and engagement of students in active learning. The social presence sub-construct of group cohesive is created by instructor actions and course activities that build and sustain a sense of group commitment within the online community(Garrison, 2007).The pedagogical benchmarks used for this study by the course instructor were considered and aligned to the teaching presence sub-construct of facilitation and its indicator of sharing personal meaning. The benchmarks included providing personal teaching anecdotes, extensive personalized feedback, timely grading and student access to a faculty's direct phone number, email, text or voice messaging, and online evening meetings.

In addition, the pedagogical benchmarks were also considered and aligned to the teaching presence sub-construct of group cohesion and its indicator of encourage collaboration. The benchmarks included the use of collaborative wiki tools, providing contact information (a direct phone number, email, text and voice messaging), being readily available, including evening online meetings, and providing extensive personalized feedback to students' questions or assignments. Table 7 conveys the relationship for both group types between the CoI cognitive presence, the identified sub-construct predictor variables, research established CoI indicators and the pedagogical benchmarks used for this study.

Table 7

Pedagogical benchmarks aligned to CoI cognitive construct and sub-constructs (Garrison et al., 2000; Garrison & Arbaugh, 2007; Garrison, 2007; Garrison, 2016)

CoI Presence	Group	Associated Sub-constructs	Indicators	Pedagogical Benchmarks
Cognitive	Major-specific &GenEd	Teaching: Facilitation	Maintain interest, motivation, engagement and share personal meaning	✓ Personal teaching anecdotes ✓ Extensive personalized feedback ✓ Timely grading ✓ Direct phone ✓ Email/voxer ✓ Evening online meetings
		Social: Group Cohesive	Build and sustain group commitment, encourage collaboration, active learning	✓ Collaborative wiki ✓ Direct phone ✓ Email/voxer ✓ Evening online meetings ✓ Extensive personalized feedback

As one considers the findings and conclusions from this study, it is important to recognize its boundaries and limitations. Parameters that define the scope and boundaries of a study are delimitations. This study was restricted to online major-specific and GenEdcourses taught by one instructor at a community college. There are also limitations to how one should interpret and use the results of this study. Considerations include the fact that the data was self-reported and may not represent authentic course engagement. Although students' perceptions of the CoI presences from the perspective of the individual learning experience is valuable, the accuracy of these perceptions is difficult to confirm. In addition, the purposive convenience sample used for this study means there are limitations for statistical inference to the broader population of community college students. Moreover, the sample also lacked significant ethnic diversity, with approximately 72% of the participants reporting as Caucasian. However, the evaluation of the CoI presences as experienced by GenEd and major-specific students, as reported from one instructor's courses, could be generalizable through the use of the proximal similarity model (Campbell, 1986) by online instructors in similar teaching situations and environments.

9.0 CONCLUSIONS AND RECOMMENDATIONS

While research focusing on best practices for online instruction is available, there is little published research comparing and contrasting the needs of online learners enrolled in major-specific courses to those of online learners enrolled in GenEd courses within the community college environment. The findings of this study

contribute to the broader knowledge of higher education instruction specific to online GenEd and major-specific courses within a community college context and may be used to help improve the student learning experience and increase student retention. Moreover, it provides valuable direction that may be beneficial to instructors in similar online teaching situations.

One outcome of this study is the alignment of pedagogical benchmarks with indicators from the CoI sub-constructs, as defined by Garrison (2007), which may inform best practices for online pedagogy unique to a GenEd or major-specific online course taught at a community college. The study has shown how major-specific and GenEd online students perceive the CoI framework and can provide guidance to policy makers, educational leaders, and instructional practitioners.

Policymakers should consider targeted funds for the creation and instruction of online courses unique to a discipline or first-semester students within a community college environment. If financial support was offered to improve specific types of online courses, students may report higher cognitive learning and course satisfaction, as well as two-year institutions seeing an overall improvement in online course retention.

Educational leaders should encourage online faculty to use the CoI questionnaire as a tool for online course assessment. CoI results could provide an improved awareness of their students' online experience resulting in an instructor being more purposeful in the design and delivery of their online courses (Bangert, 2009).

Although the CoI framework has been used in online pedagogical research since 2000, and the CoI questionnaire has been used since 2008, the evolution of online coursework and pedagogy necessitates continued study. Foremost, there is a need for additional research using larger inter-disciplinary and inter-institutional samples over time (Arbaugh et al., 2010; Garrison & Arbaugh, 2007; Stenbom, 2018). Future research using different mediating variables, such as satisfaction, academic performance, and academic achievement, may further contribute to effective instructional practices. This includes replicating the methods used in this study across other disciplines. Furthermore, it is recommended that future studies use random sampling techniques to improve the level of external validity and the ability to statistically generalize the findings. Given the limitations of the current study, a critical dimension of this future research should include an investigation of the learning experiences of subgroups of the population, such as by gender, race, age and other influential factors.

Finally, quantitative findings provide a particular type of data to be analyzed. The answers to the questions presented in this study could be even better informed by additional studies that use qualitative methods. These future studies may further illuminate similarities and discrepancies found through quantitative studies. An additional perspective provided by qualitative data and its interpretation might better inform and explain the students' online experience (Kozan & Caskurlu, 2018) and differences observed between class types. Ultimately, regardless of the methodology, there is a continued need to further investigate online pedagogy and to seek to identify and provide guidance about online pedagogical best practices.

References

Arbaugh, J. B., Bangert, A., & Cleveland-Innes, M. (2010). Subject matter effects and the Community of Inquiry (CoI) framework: An exploratory study. *Internet and Higher Education*, *13*(1–2), 37–44. https://doi.org/10.1016/j.iheduc.2009.10.006

Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C., & Swan, K. P. (2008). Developing a community of inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. *The Internet and Higher Education*, *11*(3–4), 133–136. https://doi.org/10.1016/j.iheduc.2008.06.003

Archibald, D. (2010). Fostering the development of cognitive presence: Initial findings using the community of inquiry survey instrument. *The Internet and Higher Education*, *13*(1–2), 73–74. https://doi.org/10.1016/J.IHEDUC.2009.10.001

Bangert, A. W. (2009). Building a validity argument for the community of inquiry survey instrument. *Internet and Higher Education*, *12*(2), 104–111.https://doi.org/10.1016/j.iheduc.2009.06.001

Bolliger, D. U., Halupa, C., Cho, M., Tobias, S., Rubin, B., Fernandes, R., Avgerinou, M. D., Jackson, L. C., Jackson, A. C., Chambers, D., Bolliger, D. U., Wasilik, O., Gutierrez-Santiuste, E., & Gallego-Arrufat, M. J. (2013). The effects of technology on the community of inquiry and satisfaction with online courses. *Internet and Higher Education*, *17*(1), 48–57. https://doi.org/10.1016/j.iheduc.2012.09.006

Bruce, P., & Bruce, A. (2017). *Practical Statistics for Data Scientist*. O'Reilly Media.

Campbell, D. T. (1986). Relabeling internal and external validity for applied social scientists. *New Directions for Program Evaluation*. https://doi.org/10.1002/ev.1434

Cronk, B. C. (University of W.-M. (2020). *How to use SPSS: A Step-by-Step Guide to Analysis and Interpretation* (Eleventh). Routledge.

Garrison, D., Anderson, T., & Archer, W. (2000). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*, *2–3*, 87–105. https://doi.org/10.1016/S1096-7516(00)00016-6

Garrison, R., Cleveland-Innes, M., & Vaughan, N. (2016). *Community of Inquiry: Welcome*. https://coi.athabascau.ca

Garrison, D. R. (2007). Online Community of Inquiry Review : Social , Cognitive , and Teaching Presence Issues. *Journal of Asynchronous Learning Networks*, *11*(1), 61–72. https://doi.org/10.1128/JB.05513-11

Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. *Internet and Higher Education*, *10*(3), 157–172.

Garrison, D. R., Cleveland-Innes, M., & Fung, T. S. (2010). Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the community of inquiry framework. *Internet and Higher Education*, *13*(1–2), 31–36. https://doi.org/10.1016/j.iheduc.2009.10.002

Gutiérrez-Santiuste, E., Rodríguez-Sabiote, C., & Gallego-Arrufat, M.-J. (2015). Cognitive presence through social and teaching presence in communities of inquiry: A correlational–predictive study. In *Australasian Journal of Educational Technology* (Vol. 31, Issue 3). https://doi.org/10.14742/ajet.v0i0.1666

Kozan, K., & Caskurlu, S. (2018). On the N th presence for the Community of Inquiry framework. *Computers and Education*. https://doi.org/10.1016/j.compedu.2018.03.010

Kozan, K., & Richardson, J. C. (2014a). Interrelationships between and among social, teaching, and cognitive presence. *Internet and Higher Education*, *21*, 68–73. https://doi.org/10.1016/j.iheduc.2013.10.007

Kozan, K., & Richardson, J. C. (2014b). New exploratory and confirmatory factor analysis insights into the community of inquiry survey. *The Internet and Higher Education*, *23*, 39–47. https://doi.org/10.1016/J.IHEDUC.2014.06.002

Seaman, J. E., Allen, I. E., & Seaman, J. (2018). *Grade Increase: Tracking Distance Education in the United States*. https://files.eric.ed.gov/fulltext/ED580852.pdf

Shaw, M., & Witt, S. (2015). Employment Status , Teaching Load , and Student Performance in Online Community College Courses. *Online Journal of Distance Learnining*, *2007*, 1–15.

Shea, P., & Bidjerano, T. (2009). Community of inquiry as a theoretical framework to foster "epistemic engagement" and "cognitive presence" in online education. *Computers and Education*, *52*(3), 543–553. https://doi.org/10.1016/j.compedu.2008.10.007

Shea, P., Gozza-Cohen, M., Uzuner, S., Mehta, R., Valtcheva, A. V., Hayes, S., & Vickers, J. (2011). The community of inquiry framework meets the SOLO taxonomy: A process-product model of online learning. *Educational Media International*, *48*(2), 101–113. https://doi.org/10.1080/09523987.2011.576514

Stenbom, S. (2018). A systematic review of the Community of Inquiry survey. *Internet and Higher Education*. https://doi.org/10.1016/j.iheduc.2018.06.001

Swan, K. P., Richardson, J. C., Ice, P., Garrison, D. R., Cleveland-innes, M., & Arbaugh, J. Ben. (2008). Validating a measurement tool of presence in online communities of inquiry. *E-Mentor*, *2*(2), 1–12. https://doi.org/7

Szeto, E. (2015). Community of Inquiry as an instructional approach: What effects of teaching, social and cognitive presences are there in blended synchronous learning and teaching? *Computers & Education*, *81*, 191–201. https://doi.org/10.1016/J.COMPEDU.2014.10.015