ONLINE PRESENCE, METACOGNITION, AND COURSE DESIGN WITHIN THE COMMUNITY OF INQUIRY

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ABSTRACT

This study examined students' perceived metacognition and online presence within the Community of Inquiry (CoI) framework in online courses. Forty students participated in this study. Data were collected through the CoI survey instrument and shared metacognition questionnaire. The findings revealed students rated teaching presence as the highest while social presence was the lowest among the three presences. Students rated individual metacognition higher than group metacognition. Students identified readings, discussions, and application activities as the most contributing course elements to their critical thinking. Students shared that the instructor's feedback was the most encouraging facilitation technique for critical thinking. The findings of this study will be helpful for researchers and practitioners who design and teach asynchronous online courses for undergraduate students to promote metacognition.

KEYWORDS

Community of Inquiry, Metacognition, Online Presence, Asynchronous

1. INTRODUCTION

There is a need to understand undergraduate students learning in asynchronous online courses (Garrison and Akyol 2015). Research suggests that understanding how metacognition manifests in a shared learning environment can help select effective course designs to guide deep learning outcomes (Garrison 2022). Previous studies examined how group activities can impact students' individual metacognition to self-regulate critical thinking (DiDonato 2013; Koehler et al. 2020). DiDonato (2013) found that group interactions can contribute to individual metacognition when students were given a complex semi-structured task. However, Koehler et al. (2022) found that students did not have effective regulation strategies to deal with the complexity of group ownership. Researchers suggested that group activities should be thoughtfully designed to help students individually and collaboratively regulate their learning. Koehler et al. (2020) noted that further research is needed to determine how students can regulate learning. Similarly, Garrison (2022) noted that the role of metacognition in online courses has not been enough examined yet. It is not clear enough how critical thinking should be structured in shared contexts when students participate in group activities, i.e., discussions.

Therefore, this study is an attempt to fill this gap by providing an examination of undergraduate students' perceptions of online presence and metacognition when they participate in asynchronous online course group activities, i.e., discussions or role-play. The following research questions guided this study:

1. What are student perceptions of online presence (teaching, social, and cognitive) in asynchronous online courses?
2. What are student perceptions of metacognition in asynchronous online courses?
3. What course design elements contributed to student learning and what course aspects encouraged perceived critical thinking?

2. BACKGROUND

The Community of Inquiry (CoI) framework has been created to help examine the construction of individual and group learning experiences in asynchronous online courses (Garrison 2022). The framework consists of three overlapping presences: cognitive presence, teaching presence, and social presence (Garrison et al. 2010a). In this study, we define them as the study constructs. The construct of cognitive presence guides the construction of meaning through reflection and discourse; it is operationalized through the Practical Inquiry model that supports the dynamics of reflective thinking and a collaborative inquiry process (Garrison et al. 2001). The construct of social presence can enhance students' cognitive processes through social interactions in asynchronous online environments; it also can predict students perceived cognitive presence (Akyol and Garrison 2008). The construct of teaching presence is defined as "the design, facilitation, and direction of cognitive and social processes to realize personally meaningful and educationally worthwhile learning outcomes" (Anderson et al. 2001, p.5). This type of presence is essential to establishing and maintaining an effective social and cognitive presence (Garrison et al. 2010b). In addition, teaching presence contributes to the creation of an online community of learners to provide opportunities for social interactions.

According to Garrison and Akyol (2015, p. 67), teaching presence can help "understand metacognitive development by encouraging students to take personal responsibility for their learning through facilitating discourse and resolving misunderstandings collaboratively." Metacognitive development or metacognitive construct is defined as "a set of higher knowledge and skills to monitor and regulate cognitive processes of self and others" (Garrison and Akyol 2015, p.184). Metacognition is a required cognitive ability to achieve deep and meaningful learning that must be viewed from both an individual and social perspective.

Garrison, Anderson, and Archer's (2000) Community of Inquiry (CoI) was used as the theoretical framework to understand students' perceptions of online presence and metacognition in asynchronous online courses. The CoI framework provides a model of cognition that operationalizes online learning with the perspective of understanding metacognitive processes in the asynchronous online learning environment (Garrison 2022). The CoI framework was used as a guide to examine how students deal with multiple opportunities to be self-reflective and communicative to support and sustain metacognition in the asynchronous learning environment (Garrison and Akyol 2015). The commonality between metacognition and the CoI is the interplay between internal knowledge construction and course learning activities. The CoI framework was used because it emphasizes both the personal and shared worlds of a learning experience, which is consistent with metacognition in the shared online learning environment and the integration of the personal and shared view of metacognition (Garrison et al. 2010a).

3. METHODS

A descriptive research design was used to provide exploration regarding the perceived online presence construct (teaching, cognitive, and social) and metacognitive construct in asynchronous online courses for undergraduate students. Forty students from a public university located in the Mid-Atlantic area of the U.S. participated in this study. The sample was majority female (80.0%, n = 32; male: 17.5%, n = 7; unknown: 2.5 %, n =1) and approximately more than half (67.5%, n = 27) of them were in the age of between 18 and 25 years. The majority (75.0%, n=30) of the participants have taken more than four online courses, and most (62.5%, n=25) of them rated themselves as being very comfortable with participating in online courses. The sample was included in the study because students were enrolled in the Psychology Undergraduate Online Program courses in summer, 2022 and voluntarily completed the survey. The courses in this study were designed following the COI principles for collaborative learning including problem-based approach, case-based learning, role-based discussions, project-based approach, peer review facilitation, and scenario-based learning.

3.1 Data Sources

Data were collected by using the CoI Survey instrument and the metacognition questionnaire survey. The online surveys were administered to students at the end of the summer semester 2022 through Qualtrics. The CoI survey was developed by Arbaugh et al. (2008) to measure students' perception of teaching presence (TP),

social presence (SP), and cognitive presence (CP). The survey consists of 34 five-point, Likert-type items (TP: 13- items, SP: 12 items, CP: 9 items). The CoI survey was validated with Cronbach's Alpha yielded internal consistencies equal to 0.94 for Teaching Presence, 0.91 for Social Presence, and 0.95 for Cognitive Presence (Arbaugh et al. 2008).

Students' perceptions of metacognition were measured using the metacognition questionnaire developed by Garrison and Akyol (2015) which includes 26 five-point, Likert-type items in two dimensions: Self-regulation and co-regulation. Each item employs a 5-point Likert-type scale, with 1 = strongly disagree and 5 = strongly agree. The metacognitive construct survey conducted by Garrison and Akyol (2015) needs further validation of the shared metacognition instrument with a larger sample size. The instrument was validated for 292 participants and the researchers did not find a correlation between the factors (individual monitoring and managing; group monitoring and managing) and self and co-regulation (Garrison and Akyol 2015, p.68). However, the instrument confirmed the metacognitive construct and has the potential to continue developing future research.

Simple demographic information was also collected such as gender, age, prior experience with online courses, and the courses to which a student was enrolled. Students were asked to respond to three sets of survey questions: with a reflection on their CoI, individual self-regulation, and co-regulation. The survey data were analyzed through descriptive statistics using means and standard deviations.

4. RESULTS

The findings for the first research question showed that students rated three presences as the following: cognitive presence (M=4.15, SD=.21); teaching presence (M=4.32; SD=0.22), and social presence (M=3.70; SD=0.33). Among the three online presences, teaching presence was rated as the highest while social presence received the lowest rating among students (M=3.70; SD=0.33). Further analysis of teaching presence revealed that students rated as the highest (M=4.63; SD=0.49), the item that the instructor provided clear instructions on how to participate in course learning activities (Table 1). It seems the online courses provided a clear and well-structured explanation of all course activities and assignments. However, the item of whether the course instructor helped identify areas of agreement and disagreement on course topics that helped students to learn received the lowest rating (M=3.92; SD=0.96). It seems that undergraduate students needed more help and support from their course instructor while participating in online course activities, i.e., online discussions or course projects.

Table 1. Students' perceptions of teaching presence in asynchronous online courses (n=40)

Teaching Presence Items	M	SD
The instructor clearly communicated important course topics.	4.54	0.64
The instructor clearly communicated important course goals.	4.56	0.60
The instructor provided clear instructions on how to participate in course learning activities.	4.63	0.49
The instructor clearly communicated important due dates/time frames for learning activities.	4.51	0.76
The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	3.92	0.96
The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	4.36	0.90
The instructor helped to keep course participants engaged and participating in productive dialogue.	4.24	0.85
The instructor helped keep the course participants on the task in a way that helped me to learn.	4.33	0.77
The instructor encouraged course participants to explore new concepts in this course.	4.41	0.72
Instructor actions reinforced the development of a sense of community among course participants.	4.13	0.84
The instructor helped to focus discussions on relevant issues in a way that helped me to learn.	4.24	0.85
The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.	3.97	0.97
The instructor provided feedback in a timely fashion.	4.28	1.02

When we analyzed cognitive presence items to understand students learning, we found that students rated high (M=4.33; SD=0.70) the item that they were able to apply the knowledge created in the course to their work or other non-class-related activities (Table 2). However, the lowest rating was the item "Online discussions were valuable in helping me appreciate different perspectives" (M=3.67; SD=1.24).

Table 2. Students' perceptions of cognitive presence in asynchronous online courses (n=40)

Cognitive Presence Items	M	SD
Problems posed increased my interest in course issues.	3.77	1.04
Course activities piqued my curiosity.	4.08	0.84
I felt motivated to explore content-related questions.	4.10	0.91
I utilized a variety of information sources to explore the problems posed in this course.	4.29	0.84
Brainstorming and finding relevant information helped me resolve content-related questions.	4.11	0.86
Online discussions were valuable in helping me appreciate different perspectives.	3.67	1.24
Combining new information helped me answer questions raised in course activities.	4.26	0.64
Learning activities helped me construct explanations and solutions.	4.26	0.75
Reflection on course content and discussions helped me understand fundamental concepts in this class.	4.26	0.72
I can describe ways to test and apply the knowledge created in this course.	4.37	0.59
I have developed solutions to course problems that can be applied in practice.	4.13	0.88
I can apply the knowledge created in this course to my work or other non-class-related activities.	4.33	0.70
Overall, I was satisfied with an online course.	4.32	0.87
I learned much from an online course.	4.28	0.72

Among social presence items, the highest rating was for the item "I felt comfortable participating in the course discussions" (M= 4.14; SD=0.99) (Table 3). Students rated the lowest the item "Online or web-based communication is an excellent medium for social interaction" (M=3.18; SD=1.32).

Table 3. Students' perceptions of social presence in asynchronous online courses (n=40)

Social Presence Items	M	SD
Getting to know other course participants gave me a sense of belonging in the course.	3.38	1.18
I was able to form distinct impressions of some course participants.	3.44	1.17
Online or web-based communication is an excellent medium for social interaction.	3.18	1.32
I felt comfortable conversing through the online medium.	4.03	0.99
I felt comfortable participating in the course discussions.	4.14	0.99
I felt comfortable interacting with other course participants.	4.00	1.03
I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	3.82	1.02
I felt that my point of view was acknowledged by other course participants.	3.82	1.12
Online discussions help me to develop a sense of collaboration.	3.54	1.23

The results for the second research question revealed that individual metacognition items (Table 4) showed higher ratings than the group metacognition (Table 5). For example, students rated the item "I am aware of my effort" for self-regulation as the high (M=4.69; SD=0.47) while the item "I question my thoughts" as the lowest (M=4.21; SD=0.80). This explains that students are more confident about their learning efforts while rarely questioning their thoughts. The group metacognition showed a lower rating than the individual. This is when students share metacognition and create group knowledge together. They rated the two items "I pay attention

to the ideas of others" (M=4.36; SD=0.63) and "I listen to the comments of others" (M=4.36; SD=0.74) highest while the item "I monitor the learning of others" received the lowest rating (M=2.90; SD=1.19). This explains that students focused more on their learning and rarely contributed to helping others to learn. Interestingly, when students were asked to identify the course design elements that helped them learn, the majority (n=28; 70.0%) reported that the course readings and 60% (n=24) identified discussions as the design elements that helped them learn. However, reflection on learning and practice received the lowest rating (n=4; 10%).

Table 4. Students' perceptions of individual metacognition in asynchronous online courses (n=40)

Metacognition Items Individual	M	SD
I am aware of my effort	4.69	0.47
I am aware of my thinking	4.62	0.54
I am aware of my level of motivation	4.59	0.50
I question my thoughts	4.21	0.80
I make judgments about the difficulty of a problem	4.33	0.66
I am aware of my existing knowledge	4.41	0.75
I am aware of my level of learning	4.36	0.90
I assess my understanding	4.46	0.64
I change my strategy when I need to	4.33	0.62
I search for new strategies when needed	4.36	0.58
I apply strategies	4.38	0.63
I assess how I approach the problem	4.26	0.69
I assess my strategies	4.31	0.69

Table 5. Students' perceptions of group metacognition in asynchronous online courses (n=40)

Metacognition Items Group	M	SD
I pay attention to the ideas of others.	4.36	0.63
I listen to the comments of others	4.36	0.74
I consider the feedback of others	4.26	0.82
I reflect upon the comments of others	4.28	0.83
I observe the strategies of others	4.08	0.94
I observe how others are doing	3.92	1.11
I look for confirmation of my understanding from others	4.15	0.90
I request information from others	3.54	1.10
I respond to the contribution that others make	3.97	0.81
I challenge the strategies of others	3.49	1.02
I challenge the perspectives of others	3.51	0.97
I help the learning of others	3.62	0.94
I monitor the learning of others	2.90	1.19

The analysis of students' answers to open-ended questions revealed that students found that application activities contributed to their learning because they were able to apply their knowledge, i.e., role play. Other frequently mentioned course aspects that contributed to learning were instructional videos and well-organized course structure. Among the least contributed course aspects to learning were responding to others in discussions and completing quizzes through the lockdown browser. Interestingly, when students were asked to share suggestions on further course improvements, students shared that they wanted more interactive discussions and more role-play activities. When asked about what encouraged their critical thinking, students mentioned that the course design, engagement, and course topics encouraged them to learn. Among instructor facilitation techniques that encouraged or discouraged students' critical thinking, some students mentioned that the instructor's feedback encouraged them while others shared that minimal or no instructor's feedback discouraged their critical thinking.

5. DISCUSSION

To facilitate higher-order learning among undergraduate students, instructors need to structure group activities in a way to help undergraduate students move from individual metacognition (self-regulation) to shared (group) metacognition. Students in this study still did not perceive others as the way to learn and develop critical thinking. They still focused on their learning and probably they were not ready to contribute to group knowledge. We consider that these specific findings are advantages of this study. Specifically, how students perceived their learning to contribute to the learning of others.

The findings also revealed that social presence is low in asynchronous online courses. However, students shared they wanted more engagement and fun activities, i.e., Kahoot or Zoom discussions. This suggests that the findings of this study can be applied to practice, such as instructors may pay more attention to supporting social interactions to promote cognitive presence and help students move to group-shared metacognition to build collaborative knowledge. More engagement strategies and well-designed group activities are still needed to support undergraduate students learning, especially for discussion-based activities.

6. LIMITATIONS

This study has several limitations due to the specific conditions of the data collection. The sample was not randomized because the participants were not randomly selected, and no control measures were used for comparison. Therefore, the results are not differentiated in the effect of the course design on three presences and metacognitive constructs. The sample size in some courses was low, so, the results may not be representative. Finally, the students who participated in this study were from summer courses enrolled in one online program. More data will be collected from other courses and programs.

7. CONCLUSION

This exploratory study contributed to the field of online teaching and learning to understand undergraduate students learning. Moreover, the findings of this study found evidence that undergraduate students still need instructor support in asynchronous online environments, specifically when they participate in group activities, i.e., discussions or role-play. This study also found that students needed more instructional videos and instructional feedback to promote critical thinking. More research is needed to explore the type of courses, course design, assignment tasks, and the type of students to understand how metacognitive processes manifest within the Community of Inquiry collaborative environment.

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