Advances in Cognitive Presence: Introduction to OLJ Special Issue

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In the past decade, the Community of Inquiry (CoI) framework has gained attention from scholars for its capability of capturing the collaborative construction of shared knowledge in the online community of learners (Jan et al. 2019; Park & Shea, 2020; Stenbom 2018). CoI assumes that learning occurs at the intersection of the three presences–social presence, teaching presence, and cognitive presence (Garrison et al., 2000). Cognitive presence represents the means to support and maintain a purposeful learning community (Garrison, 2017). Although scholarly evidence indicates the importance of cognitive presence to generate high-level learning in online environments, researchers suggest that it is the least researched of the three presences and little progress has been made in understanding the development of cognitive presence and higher-order thinking (Garrison, 2017; Sadaf et al., 2021). According to Garrison (2017), "much research is needed to fully appreciate the inquiry process (cognitive presence) that occurs in a shared learning environment." Therefore, this special issue meets the need for more conceptual and empirical research to explore processes and strategies that create and sustain conditions necessary to facilitate cognitive presence and higher-order learning in online environments. This special issue includes seven papers that advance new perspectives on conceptualizations and processes related to cognitive presence.

The first paper in this issue is "Shared Metacognition in a Community of Inquiry" by Randy Garrison. While much is known about the CoI framework across contexts, shared metacognition and its essential function in a community of inquiry is a new area of research that has shown considerable insight in understanding the dynamics and ultimate goals of collaborative inquiry. Garrison explored pragmatic challenges through an analysis of recent research and discussed implementation issues of the shared metacognition construct. Garrison

stated that metacognitively the educational challenge is how best to develop the dynamic of the awareness and regulatory strategies to monitor and manage inquiry in a collaborative learning environment. To examine the practical implications of shared metacognition, the focus should be at the intersection of cognitive (problem defining, exploration, integration and resolution) and teaching presence (planning, facilitation, and direct instruction). It is important to plan the true collaborative inquiry discourse by the cognitive presence construct (Practical Inquiry Model). This helps students become aware of their roles in the progression of learning tasks (setting goals, questioning ideas, considering alternative hypotheses, and ensuring progression) when they contribute from the perspectives of the phases of inquiry towards intended learning outcomes. Finally, metacognitive reflection and discourse with self and co-regulation can inform students how they can improve their approach to learning. Since this is a theoretical analysis, it advances the analytical vocabulary underlying the Community of Inquiry framework, identifying a useful area of focus for practitioners and researchers to expand.

The second paper "Manifestations of Cognitive Presence in Blended Learning Classes of the Philippine K-12 System" by Juliet Aleta Rivera Villanueva, Petrea Redmond and Linda Galligan examined cognitive presence at the intersection with teaching and social presences in blended learning in K-12 setting. The study was completed in the Philippines. Students ranked high their perceived learning at integration and resolution levels of cognitive presence in reflective community building collaborative activities. Group work impacted students' self-regulation and co-regulation strategies due to their shared metacognition, the construct that signifies "an awareness of one's learning in the process of constructing meaning and creating understanding associated with self and others" (Garrison, 2017, p.60). They become more accountable to learning time management and own responsibilities. This study provided evidence of learning community building and the applicability of the CoI in the K-12 setting.

In the third paper "Student Perceptions and Actuals of Cognitive Presence: A Case Study of an Intentionally Designed Asynchronous Online Course," Gamze Ozogul, Meina Zhu, and Tanner Phillips. The authors explored the design of an online graduate course to foster cognitive presence. The authors used Community of Inquiry (CoI) survey (for self-report) and Linguistic Inquiry and Word Count (LIWC) software (for actual behaviors) to measure cognitive presence. Additionally, they explored the relationship of cognitive presence with other presences. Findings showed that students perceived high levels of cognitive presence and actually showed high cognitive presence in their discussion board acts. In addition, findings showed that teacher and social presence are strong predictors of perceived cognitive presence. They found strategies that helped students to stay cognitively present in this asynchronous online course were, instructor being responsive in discussion posts and creating dialogue, creating course assignments as online hands-on project, interviewing guest speakers on specific course topics, weekly recap and orientation videos, feedback, case-based discussions, and overall teacher being present in the course.

The fourth paper is "Predicting Cognitive Presence in At-Scale Online Learning: MOOC and For-Credit Online Course Environments" by Jeonghyun Lee, Farahnaz Soleimani, India Irish, John Hosmer, IV, Meryem Yilmaz, Soylu, Roy Finkelberg and Saurabh Chatterjee. This study examined applications of machine learning and learning analytics techniques to identify students' levels of cognitive presence in their discussion posts by running a machine learning model. The authors used a transformer-based deep learning model referred to as Bidirectional Encoder Representations from Transformers (BERT), which pre-trains and fine-tunes relevant text data. Authors were inspired by existing machine learning models that automatically classify

the level of cognitive presence (Chi & Wylie, 2014; Hayati, Idrissi, & Bennani, 2020; Kovanović et al., 2016; Neto et al., 2021). The results revealed that students' cognitive presence may differ by the course type and design. The type of discussions where students were asked to discuss assignments received higher levels of cognitive presence. The findings of this study are consistent with Sadaf et al.'s (2021) findings that higher levels of cognitive presence are closely associated with their actual final course grades.

The fifth paper in this issue is "The Impact of Designing an Online Discussion Strategy with Learning Analytic Feedback on the Level of Cognitive Presence and Students' Interaction in an Online Learning Community" by Enas Alwafi. This experimental study examined how learning analytics-based elaboration feedback can impact students' cognitive presence and interactions when they participate in asynchronous online discussions. While the first online discussion results were not different between two groups, the second online discussion revealed that the experimental group did better in terms of increasing both levels of cognitive presence and density of the network, i.e., interaction. Students who received learning analytics-based elaboration feedback perceived their motivation and participation engagement were increased because they were aware of the quality of their participation and their classmates' connections. The sixth paper "Evaluating Impact and Perception of a Structured Online Peer Evaluation System Among Graduate Communication Capstone Students Through Action Research" by Karen L Wilkinson. This action research examined the impact of a structured online peer evaluation system for Graduate Communication Capstone students, including an interactive educational technology peer review tool kit innovation. The most frequently coded levels of cognitive presence were exploration and triggering events followed by integration and resolution. The authors mentioned that students actively shared outside resources, offering referrals back to prior instructor guidance, and citing and referencing valid sources to justify their claims during the structured peer review process. This study proved that computer-based cognitive tools can create, facilitate and extend learning and collaboration in alignment with the principles of cognitive apprenticeship, i.e., modeling, coaching, scaffolding, articulation, reflection, and exploration.

The final paper in this issue is "Exploring Cognitive Presence in Online Courses: A Systematic Review (2008-2020)" by Robert Moore and Courtney Miller. Authors examined 24 articles published between 2008-2020 that empirically analyzed cognitive presence in online courses. They synthesized the literature focusing on ways instructors can use to develop their learner's cognitive presence. Results revealed that although reaching the higher levels of cognitive presence– integration and resolution–are optimal, it is not common to reach final phases, particularly the resolution stage. The authors recommend instructors to align their learning objectives with the learning outcomes at appropriate levels of cognitive presence. This study shows the importance of providing clear participation requirements, identifying multiple ways to integrate technology, and designing structured discussion forums in fostering the development of cognitive presence.

The studies in this special issue examined different approaches to facilitate and promote cognitive presence in different learning environments. The findings are varied across the contexts, population and the type of treatment. However, there is consistency in findings that higher levels of cognitive presence can be achieved in the environments where cognitive presence phases based on the Practical Inquiry Model are intentionally incorporated into a learning task or the course design. The task design is part of teaching presence (planning, facilitation and direct instruction). When the collaborative inquiry task is intentionally pre-

designed based on the phases of cognitive presence (triggering events, exploration, integration, and resolution), the course instructors can provide thoughtfully designed cognitive and metacognitive processes for their students. In other words, according to Garrison in this issue, to advance cognitive presence in inquiry-based collaborative environments, we need to consider shared metacognition to intentionally regulate the process of cognitive learning.

Future research on cognitive presence is entering a new phase where a more thoughtful investigation of how cognitive presence and shared metacognition can be designed, developed, and evaluated in a community of inquiry to enhance the inquiry process. Instead of reporting the final outcomes in terms of the frequency of posts per cognitive presence phase, studies should pay attention to the type of the inquiry task and how it impacts the process of cognitive presence and shared metacognition. For example, researchers can investigate how different aspects of course design, facilitation techniques, and instructional strategies impact students' progression through the levels of cognitive presence and shared metacognition in a purposeful collaborative inquiry to achieve intended learning outcomes. Furthermore, studies can examine how intentionally designed collaborative inquiry learning environments allow learners to regulate cognitive processes and how shared metacognitive processes can be pre-designed to go beyond self-regulation and co-regulation.

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