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Review Article

Collaborative Learning and Learner Engagement within the Community of Inquiry Model: A Systematic Review

Runu Mani Das [1 *], Madhusudan J.V. [2]

[1] Research Scholar, Department of Education and Education Technology, University of Hyderabad, India
[2] Professor, Department of Education and Education Technology, University of Hyderabad, India

Abstract – The Community of Inquiry (CoI) approach is one of the most recent methods aimed at enhancing learner engagement in online learning environments. This model centers on three key elements: teaching presence, social presence, and cognitive presence. Learner engagement and collaborative learning constitute two fundamental aspects of online education, with a strong focus on mental and social engagement, group activities, and project work. Collaboration among learners and instructors plays a pivotal role in improving the overall online educational experience. This study sought to assess the effectiveness of the Community of Inquiry model in promoting collaborative learning and enhancing learner engagement in online settings. The study employed a systematic review methodology, analyzing eight studies conducted between 1990 and 2021. The findings of the study indicate that the Community of Inquiry model significantly contributes to learners' engagement and fosters collaborative learning among peers, ultimately enhancing learner performance and positively impacting cognitive, emotional, and behavioral engagement.

Keywords: Collaborative Learning, Learner Engagement, Community of Inquiry, Online Learning.

Introduction

The Community of Inquiry (CoI) framework, developed by Garrison, Anderson, and Archer in 1999 is widely used pedagogical model outlines with three critical dimensions for shaping online learning experiences: Cognitive Presence (engaging in critical thinking), Social Presence (building a sense of community), and Teaching Presence (instructor's role in guiding learning) (Kovanović et al., 2018). “The CoI model emphasises on meaningful learning and effective evaluation in a setting of online education” (Garrison et al., 2000). The community of inquiry model is designed to experience collaborative-constructive learning experiences (Garrison et al., 2010). The terms ‘community’ and ‘inquiry’ is assumed as the interactive and engaging rather than mere conveniet online learning (Shea et al., 2022). The model has three main components that describe the online epistemic process: cognitive, teaching and social presence. Cognitive presence is defined as the ‘the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication’ (Garrison et al., 2001). Teaching presence defined as the design, facilitation, and direction of cognitive and social processes for fulfilling the meaningful educational outcomes (Anderson et al., 2001). Teaching presence is the direction or the instruction given by the teacher through instructional management, direct instruction for the development of social and cognitive presence (Lowenthal & Dunlap, 2010). Social presence is defined as the idea of expressing and interacting collaboratively with the degree of comfort and confidence in the online learning. It projects learners socially and emotionally with the medium of communication. The phases of social presence include affective expression, open communication and group cohesion. It develops a sense of belongingness (Alman et al., 2012; Sung & Mayer, 2012) among the learners to discourse cognitive presence in the online learning (Alman et al., 2012; Sung & Mayer, 2012).

* Corresponding author: Department of Education and Education Technology, University of Hyderabad, India.
e-mail addresses: runumanidas123@gmail.com, madhusudanjv@uohyd.ac.in

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The framework is one of the approaches to collaborative-constructive educational experience that is created to guide the design and dissemination of online learning experiences (Garrison, 2011). Correspondingly, one of the most efficient approaches is collaborative learning which focuses on online learner engagement. It enables pupils to cooperate in small groups to accomplish the same objective (Liu & Tsai, 2008; Prince, 2004). Collaborative learning promotes students' language and social development, involvement in the educational experience and inventive problem-solving abilities (Tomcho & Foels, 2012). Collaborative activities, group discussion, and communication in the community can lead to improve learner engagement in an online learning situation (Garrison et al., 2001). Moreover, learner engagement is a significant element in an online platform and requires the designed model to engage the learner in an online environment. Comprehensively, it is the community of inquiry framework that provides facilities to learner for collaborative-interactive learning experience which help to improve students engagement in online learning settings.

Attempts have been made to study collaborative learning and learner engagement in the community of inquiry framework. Swan, Garrison & Richardson, (2009) have noticed that the community of inquiry provides the environment of a collaborative-constructive and practical model for online learning (Swan et al., 2009). Hagaman, Sally, (1990) argues in his article that collaborative learning is an innovative method to enhance art education among learners (Hagaman, 1990). Collaborative learning improves learner's social skills and cognitive abilities among learners. A study on online collaborative learning found that there is a distinction to be made of collaborative learning between conventional face-to-face and asynchronous network learning. Further, Damm, Carol (2016) in their study found that the community of inquiry model positively impacts learner engagement in a large online classroom (Damm, 2016). However, social, emotional and cognitive engagement is difficult in a large online classroom. In their study, Buelow and his colleagues (2018) revealed that certain parts of online discussion and interactive assignments engage learners in an online learning environment. Waters and Gasson, (2006) found that student's engagement in online environment depends on the early identification and encouragement of thought leaders who complex the learning environment (Waters & Gasson, 2006). The past studies separately discussed the importance of collaborative learning and learner engagement in the community of inquiry framework. No studies have focused collectively on collaborative learning and learner engagement in the CoI model. The present study will be useful in explaining the significance of collaborative learning and learner engagement in the CoI model. Keeping this in mind, an effort is made to review the existing studies systematically to understand whether collaborative learning and learner engagement is possible in the community of inquiry model by applying the systematic review method.

Objectives of The Study

To study

1. Whether community of inquiry framework (CoI) supports collaborative active learning in an online learning environment?
2. Whether community of inquiry framework supports learner engagement in an online learning environment?

Method

The systematic review method has been adopted to understand collaborative learning and learning engagement in the CoI model for the present study. Kitchenham, 2007 described a systematic literature review as an excellent technique to evaluate and examine all the research on a specific research issue and topic (Kitchenham, Barbara Ann and Charters, 2007). A systematic review aims to objectively assess a study issue using a reliable, strict, and verifiable process.

Planning the review

Planning the review is the first stage of a systematic review process. İt includes defining research objectives, selection of journal, developing a comprehensive search strategy, setting

inclusion/exclusion criteria, outlining data extraction, and addressing the categories of analysis in the study.

Journal selection

The journals related to educational technology that specifically focus on online learning experiences are selected for review purposes. Scientifically relevant data are extracted from Google Scholar, JSTOR, ERIC, and Research Gate databases to choose a suitable journal for the review. Journals viz. "Internet and Higher Education," "EURASIA Journal of Mathematics Science and Education Technology," "Journal of Pedagogical Research," and "Research in Learning Technology" journals are selected for the present study. The present study reviews eight papers published from 1990 to 2021 to recognize the importance of collaborative learning and learner engagement in the CoI model.

Inclusion and exclusion of the reviews

In inclusion criteria, collaborative learning and learner engagement in the CoI model, higher education, and student engagement are included. The present study comprises experimental studies, literature reviews, and descriptive survey methodologies.

In exclusion criteria, areas related to the comparative study, primary education, secondary education, technology as a tool for online learner engagement, etc., are excluded.

Categories of analysis

This study utilizes two tables to investigate the efficacy of the community of inquiry model for promoting collaborative learning and learner engagement. The tables present a comprehensive and brief overview of the study's findings and contribute to understanding the model's role in enhancing these crucial outcomes. The first Table supports reviews of collaborative learning, and Table 2 discusses learner engagement within the community of inquiry model.

Conducting the review

Conducting the review in a systematic review involves executing the search, screening and assessing studies, extracting data, evaluating study quality, synthesizing data and coding data by following the predefined review protocol.

Study selection

Two tables were drawn to show the title, method, and findings of the studies on collaborative learning and learner engagement in the community of inquiry framework. Eight studies are divided into two sections- i) Review report on collaborative learning in the community of inquiry and ii) Review report on learner engagement in the community of inquiry model. The Table 1 & 2 provide the reports, respectively.

Extraction of data, synthesis of data, and coding of data

After reviewing all eight articles, data synthesis and data coding were carried out thoroughly. Key terms and main themes are extracted from the systematic synthesis of the studies. The key terms are coded as social interaction, positive learning, active and collaborative learning, effective learning experience, etc.

Table 1. Review report on collaborative learning within the community of inquiry framework

Investigation on collaborative learning	Methods	Findings
Swan, Garrison & Richardson, (2009). "A constructive approach to online learning: the community of inquiry framework" (Dean et al., n.d.).		The COI framework is the collaborative, constructive, and practical model for online learning
Hagaman, Sally, (1990). "The community of inquiry: an approach to collaborative learning" (Hagaman, 1990).		A collaborative community of inquiry learning is an innovative step in arts education. Social interaction and cognitive aspect is considered as a reflective point in collaborative learning
Hsu & Shiue, (2018). "Exploring the influence of using collaborative tools on the community of inquiry in an inter-disciplinary project-based learning context" (Hsu et al., 2019).	Descriptive survey method	Collaborative technologies help for better learning, enhance understanding, and enhance social behaviour among learners
Aslan, Alper (2021). "The evaluation of collaborative synchronous learning environment within the framework of interaction and community of inquiry: an experimental study" (Aslan, 2021).	Quasi-experimental research design	The experimental group executed well on perception tests than the control group. Collaborative synchronous learning environments provide a more effective learning experience to students.

Table 2. Review report on learner engagement in the community of inquiry framework

Investigation on learner engagement	Methods	Findings
Damm, Carol (2016). "Applying a community of inquiry instrument to measure student engagement in large online courses" (Damm, 2016).	Mixed method with validate CoI survey	In a big online class, the CoI approach measures student engagement well. Due to the high student enrolment, social, emotional, and cognitive involvement in the classroom has become challenging.
Waters and Gasson, (2006). "Social engagement in an online community of inquiry" (Waters & Gasson, n.d.).	Exploratory research design	Students' engagement may be aggravated by identifying earlier stage and students' encouragement may lead to engagement in the online learning
Vaughan, N.(2010). "A blended community of inquiry approach: linking student engagement and course redesign" (Vaughan, 2010).	Qualitative descriptive survey method	Students showed greater interest in the course concepts. Collaborative learning and active learning significantly improve while applying the community of inquiry approach in the course.
Jane Tiedt et. al. (2021). "The effect of online course duration on graduate nurse educator student engagement in the community of inquiry" (Tiedt et al., 2021).	Quasi-experimental research design	Students actively participated in the community of learners' learning process. The model seems to contribute to a constructive online educational experience. Learners were socially and cognitively engaged in the course.

Findings

The final stage deliberates the summarizing methods, presenting findings, discussing implications, and providing a clear conclusion while following established guidelines and considering peer review for publication. The study reviewed a total of eight articles and summarised its findings into two broad terms: collaborative learning within the community of inquiry framework and learner engagement within the community of inquiry framework.

Collaborative learning within the community of inquiry framework

Table -1 explains the review report on collaborative learning within the community of inquiry framework in an online educational environment. It is clear that the community of inquiry framework is a constructive framework designed for effective learning in an online educational environment. Collaborative learning enhances social presence, and social interaction, social understanding, social behaviour, etc. The CoI framework works as a technique for improving collaborative learning among learners. In arts education, collaborative learning within a COI framework is considered innovative, focusing on the reflective aspects of both social interaction and cognitive processes. Collaborative technologies play a pivotal role in facilitating improved learning, understanding, and social behavior among learners. In an experimental study, the group using collaborative synchronous learning environments outperformed the control group, demonstrating the effectiveness of this approach in enhancing students' learning experiences.

Learner engagement within the community of inquiry model

Table 2 provides an overview of the review report, focusing on learner engagement within the Community of Inquiry (CoI) model. It highlights the potential for social, behavioral, and emotional engagement within the CoI framework, emphasizing its effectiveness in enhancing students' engagement when applied in educational settings.

In the context of a large online class, the Community of Inquiry (CoI) approach has proven to be a reliable measure of student engagement. However, the challenges of managing high student enrolment have led to difficulties in fostering social, emotional, and cognitive involvement within the virtual classroom. Recognizing the importance of addressing these challenges, proactive efforts have been made to identify students at an earlier stage and provide them with encouragement, which has demonstrated a positive impact on overall student engagement in the online learning environment.
One noteworthy outcome has been the heightened interest displayed by students in grasping course concepts. This increased enthusiasm is a direct result of the successful implementation of collaborative and active learning strategies within the framework of the Community of Inquiry approach.
Through active participation in the collaborative learning process fostered by the CoI model, students have become integral members of a dynamic learning community. As a result, this approach has contributed significantly to the creation of a constructive and enriching online educational experience. Students have found themselves not only socially engaged but also cognitively immersed in the course material, demonstrating the model's ability to cultivate holistic engagement within the learning process.

Discussion

In this study, we have anticipated that collaborative learning and learner engagement are the two core compononents in the community of inquiry model. The study addressed mailny two issues using a systematic literature review: the community of inquiry framework to support collaborative learning in an online learning environment and the community of inquiry model to support learner engagement in an online educational setting.

The results indicate that learner engagement and collaborative learning in CoI is a practical approach. This assertion aligns with the conclusions drawn by Dean et al. (n.d.) and Nolan-Grant

(2019) in their respective research study (Dean et al., n.d.; Nolan-Grant, 2019). The model emphasizes creating a collaborative and constructive learning environment with three dimensions: cognitive, social, and emotional presence for learner participation and engagement. The community of inquiry is the successful model in online world that cultivate an enviroment of trust, to express emotions, ideas and engage to collaborate with educational stakeholders (Redmond & Lock, 2006). İn a study, discusses the importance of trust and openness for online collaboration in social presence (Coppola et al., 2004). Previous research reported that, online collaborative learning leads to development of deep thinking and knowledge construction (Barkley, E. F., Major, C. H., & Cross, 2014; Swan, 2005; Vygotsky, 1978). Harris' (2000) in her study recommended that teachers and other educational stakeholders should plan collaborative learnning environmnet which will enhance participation and enaggement of learner that may reduce abandonement of work before completion (Harris, 2000). Implementing a collaborative learning avenue fosters socio-cognitive communication and effectively enhances individual learning performance by harnessing the power of collective knowledge sharing and active participation.

Furthermore, the community of inquiry model support learner engagement in an online learning environment , a finding consistent with the research conducted by (Tiedt et al., 2021). The same study also discussed that the community of inquiry model can provide ideal learning experience and suggested to provide settings for faculty development on meaningful course enaggement and techniques for enahncing teaching presence (Tiedt et al., 2021). The cultivation of active social engagement has emerged as a pivotal driver in augmenting learner participation. The study found that community of inquiry may help to enhance social and emotional engagement among learners and teachers in online classes. Similarly, collaborative learning is also one of the factors that have a positive effect on learner engagement. Gong, L. L. found that collaborative learning in the community of inqury is effective although it has some problems. The study also explained the effectiveness of learning through CoI model in blended learning (Gong, 2018)

İn this study, we focus on the pivotal role of the CoI model as a robust pedagogical framework that not only promotes collaborative learning but also invigorates learner engagement in the online educational ecosystem. The findings validate the growing body of literature, underlining the transformative potential of the CoI model in fostering dynamic and participatory learning experiences in online settings.

Conclusion and Suggestions

The study examined the relevance of collaborative learning and learner engagement in CoI framework by using the systematic review method. Findings support that learner engagement and collaborative learning are interrelated in the CoI model. The model may have the potential to set for successful online education developed to enhance online academic participation. Collaborative learning and learner engagement collectively improve learners' social and emotional engagement in the classroom. Therefore, it may be said that the model is helpful for the learner to enhance academic performance.

In the present study, a comprehensive analysis is conducted for the period ranging from 1990 to 2021. Many studies discuss the model's role for successful online learning during this time. In recent times, the model has achieved much progress and the survey instrument of the model provides success reports in various research works. Though the recent gains are positive and encouraging, it still has some shortage while learning online. Studies found that learning presence, emotional presence and other dimensions significantly enhance learners' online engagement. The current study emphasised the importance of collaborative learning and learner engagement in the CoI model by systematically reviewing the existing papers. Teachers, academic stakeholders should apply the community of inquiry model for successful online learning. It can be helpful for educators to understand that various factors build to develop successful online learning. Collaboration among learners, group discussion, and group project work should be given importance in online classes so

that student understand the importance of collaborative learning. However, the focus should be given to online engagement among learners so that learners enjoy participation in an online class and improve cognitive, social, and emotional engagement.

In the evolving landscape of online education, numerous dimensions are central to the continued exploration of the community of inquiry framework, offering promising avenues for future research. Among these dimensions, self-regulated learning stands as a cornerstone, given its critical role in empowering students to take charge of their own learning experiences in online classrooms. Additionally, pedagogy in online classrooms remains a dynamic field, warranting ongoing investigation to uncover innovative instructional strategies that foster engaging and effective learning environments. The pervasive influence of digital media on modern education further necessitates exploration, considering its ever-evolving nature and its impact on how students interact with content and peers. Moreover, emotional presence, often overlooked but undeniably vital, emerges as a crucial dimension that demands further scrutiny. Understanding how emotional factors influence the learning process within the community of inquiry framework can profoundly impact the design and facilitation of online courses. Therefore, future studies should continue to delve into these dimensions to advance our understanding of effective online education practices and enhance the quality of digital learning experiences.

References

Alman, S. W., Frey, B. a, & Tomer, C. (2012). Social and cognitive presence as factors in learning and student retention: An investigation of the cohort model in an iSchool setting. *Journal of Education for Library and Information Science*, *53*(4), 290–302.

Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). ASSESSING TEACHING PRESENCE IN A COMPUTER CONFERENCING CONTEXT. In *JALN* (Vol. 5, Issue 2).

Aslan, A. (2021). The evaluation of collaborative synchronous learning environment within the framework of interaction and community of inquiry: An experimental study. *Journal of Pedagogical Research*, *5*(2), 72–87. https://doi.org/10.33902/jpr.2021269326

Barkley, E. F., Major, C. H., & Cross, K. P. (2014). *Collaborative learning techniques: A handbook for college faculty.*

Coppola, N. W., Hiltz, S. R., & Rotter, N. G. (2004). Building trust in virtual teams. *IEEE Transactions on Professional Communication*, *47*(2), 95–104. https://doi.org/10.1109/TPC.2004.828203

Damm, C. A. V. (2016). Applying a Community of Inquiry Instrument To Measure Student Engagement in Large Online Courses. *Current Issues in Emerging ELearning*, *3*(1), 138–171. https://scholarworks.umb.edu/cieeAvailableat:https://scholarworks.umb.edu/ciee/vol3/iss1/9%0Ahttp://scholarworks.umb.edu/ciee/vol3/iss1/9

Dean, R., Swan, K., Shea, P. E., & Arbaugh, B. (n.d.). *A constructivist approach to online learning: The community of inquiry framework Cite this paper Related papers Researching Online Communit ies of Inquiry: New CoI Survey Inst rument*.

Garrison, D. R. (2011). Communities of Inquiry in Online Learning. *Encyclopedia of Distance Learning, Second Edition, January 2009*, 352–355. https://doi.org/10.4018/978-1-60566-198-8.ch052

Garrison, D. R., Anderson, T., & Archer, W. (2000). *Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education*.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *International Journal of Phytoremediation*, *21*(1), 7–23. https://doi.org/10.1080/08923640109527071

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

Gong, L. (2018). *Community of Inquiry: An instructional approach to promote collaborative learning in blended learning*. 214–216.

Hagaman, S. (1990). *The Community of Inquiry: An Approach to Collaborative Learning* (Vol. 31, Issue 3). https://www.jstor.org/stable/1320762

Harris, J. (2000). Taboo topic no longer: Why telecollaborative projects sometimes fail. *Learning and Leading with Technology*, *27*(5), 58–61.

Hsu, Y., Irie, N. R., & Ching, Y. (2019). *Computational Thinking Educational Policy Initiatives (CTEPI) Across the Globe*. 260–270.

Kitchenham, Barbara Ann and Charters, S. (2007). Guidelines for performing systematic literature reviews in software engineering. *Technical Report, Ver. 2.3 EBSE Technical Report. EBSE*, *1*, 1–54.

Kitchenham, B. (2007). *Source: "Guidelines for performing Systematic Literature Reviews in SE", Kitchenham et al Guidelines for performing Systematic Literature Reviews in Software Engineering*.

Kovanović, V., Joksimović, S., Poquet, O., Hennis, T., Čukić, I., de Vries, P., Hatala, M., Dawson, S., Siemens, G., & Gašević, D. (2018). Exploring communities of inquiry in Massive Open Online Courses. *Computers and Education*, *119*(December 2016), 44–58. https://doi.org/10.1016/j.compedu.2017.11.010

Liu, C. C., & Tsai, C. C. (2008). An analysis of peer interaction patterns as discoursed by on-line small group problem-solving activity. *Computers and Education*, *50*(3), 627–639. https://doi.org/10.1016/j.compedu.2006.07.002

Lowenthal, P. R., & Dunlap, J. C. (2010). From pixel on a screen to real person in your students' lives: Establishing social presence using digital storytelling. *Internet and Higher Education*, *13*(1–2), 70–72. https://doi.org/10.1016/j.iheduc.2009.10.004

Nolan-Grant, C. R. (2019). The Community of Inquiry framework as learning design model: a case study in postgraduate online education. *RESEARCH IN LEARNING TECHNOLOGY*, *27*. https://doi.org/10.25304/rlt.v27.2240

Prince, M. (2004). Does active learning work? A review of the research. In *Journal of Engineering Education* (Vol. 93, Issue 3, pp. 223–231). Wiley-Blackwell Publishing Ltd. https://doi.org/10.1002/j.2168-9830.2004.tb00809.x

Redmond, P., & Lock, J. V. (2006). A flexible framework for online collaborative learning. *Internet and Higher Education*, *9*(4), 267–276. https://doi.org/10.1016/j.iheduc.2006.08.003

Shea, P., Richardson, J., & Swan, K. (2022). Building bridges to advance the community of inquiry framework for online learning. *EDUCATIONAL PSYCHOLOGIST*, *57*(3, SI), 148–161. https://doi.org/10.1080/00461520.2022.2089989

Sung, E., & Mayer, R. E. (2012). Five facets of social presence in online distance education. *Computers in Human Behavior*, *28*(5), 1738–1747. https://doi.org/10.1016/j.chb.2012.04.014

Swan, K. (2005). A Constructivist Model for Thinking about Learning Online. In J. Bourne & J. C. Moore (Eds), Elements of Quality Online Education: Engaging Communities. Needham, MA: Sloan-C. *Research Center for Educational Technology, Kent State University*.

Swan, K., Garrison, D. R., & Richardson, J. C. (2009). A constructivist approach to online learning:

The community of inquiry framework. *Information Technology and Constructivism in Higher Education: Progressive Learning Frameworks*, 43–57. https://doi.org/10.4018/978-1-60566-654-9.ch004

Tiedt, J. A., Owens, J. M., & Boysen, S. (2021). The effects of online course duration on graduate nurse educator student engagement in the community of inquiry. *Nurse Education in Practice*, *55*(July), 103164. https://doi.org/10.1016/j.nepr.2021.103164

Tomcho, T. J., & Foels, R. (2012). Meta-Analysis of Group Learning Activities: Empirically Based Teaching Recommendations. *Teaching of Psychology*, *39*(3), 159–169. https://doi.org/10.1177/0098628312450414

Vaughan, N. D. (2010). A blended community of inquiry approach: Linking student engagement and course redesign. *Internet and Higher Education*, *13*(1–2), 60–65. https://doi.org/10.1016/j.iheduc.2009.10.007

Vygotsky, L. (1978). *Mind in society.* Harvard University Press.

Waters, J., & Gasson, S. (n.d.). *SOCIAL ENGAGEMENT IN AN ONLINE COMMUNITY OF INQUIRY 1 Human-Computer Interaction*.