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The Asynchronous Classroom Agenda: Extending the Community of Inquiry Framework for Knowledge Retention

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Abstract: This article examines the connection gap in asynchronous learning environments, where students may engage with course content while experiencing limited relational interaction and collaborative depth. As online education continues to expand, understanding how asynchronous environments can support meaningful connection and knowledge development remains important. The article extends the Community of Inquiry (CoI) framework by reconceptualizing social, cognitive, and teaching presence as components of a dynamic, retention-oriented learning process rather than solely as interacting dimensions of an online learning environment. Drawing on CoI, Social Constructivist Theory, and Self-Regulated Learning Theory, the article proposes the CoI Retention Cycle, which organizes asynchronous learning into four iterative phases: engagement, meaning construction, guided reinforcement, and retention consolidation. The framework provides a process-oriented lens for examining how intentional interaction, knowledge construction, instructional guidance, and learner regulation may contribute to durable knowledge development. By connecting relational engagement with knowledge retention, the proposed framework offers a theoretical extension of CoI and a practical lens for designing and evaluating asynchronous learning environments. The article concludes with practical recommendations and directions for empirical research to examine the proposed relationships across diverse asynchronous learning contexts.

Keywords: Asynchronous Learning, Community of Inquiry (CoI), CoI Retention Cycle, Self-Regulated Learning, Social Constructivist Theory

Introduction

The growing population of online learners has created unprecedented flexibility and accessibility for students seeking degree completion. Asynchronous learning environments enable institutions to reach broader, more diverse student populations while supporting nontraditional learners who balance academic responsibilities with work, family, and other commitments. The convenience of online degree programs does not equate to lesser quality, but does create and enhance the convenience of one furthering their educational goals (Green, 2024). In fact, asynchronous learning is highly rated and favored by attending students (Hung et al., 2024). While these systems improve efficiency and convenience, they also introduce structural challenges that can unintentionally weaken interpersonal connections, trust formation, and shared understanding among students and instructors. Such challenges heighten learner isolation and are centered around a latency in real-time clarification of student contributions or concerns (Kangwa et al., 2024).

In asynchronous learning environments, communication often occurs through discussion boards, pre-recorded lectures, and written exchanges rather than real-time interaction. Although these mechanisms support the efficient transfer of information, they may limit opportunities for meaningful relational engagement. Such factors may limit or

hinder the overall development and quality of e-learning experiences (Ncube & Ngulube, 2025). As a result, learners may participate in coursework without developing the deeper sense of community, belonging, and collaborative trust that supports sustained academic engagement. This dynamic contributes to a structural condition in which collaborators exchange information in a relevant and efficient manner, yet fail to develop the relational depth necessary for high-quality academic interaction. The absence of strong relational connections can create a connection gap, leaving students academically present but socially and intellectually disengaged. Such a gap negatively influences student motivation, participation, and persistence within online programs.

Problem Statement

For online learners in particular, the connection gap can have significant implications for student retention and academic satisfaction. Without intentional strategies that foster meaningful interaction and relationship-building, students experience limited collaboration with peers and instructors, which can lead to feelings of isolation.

Although existing research has established the importance of the three elements of the Community of Inquiry (CoI)- social, cognitive, and teaching presence- in supporting meaningful online learning, less attention has been given to how these elements may operate collectively as an iterative process in asynchronous environments. In particular, the literature provides limited conceptual explanation of how intentional interaction may progress from learner engagement and meaning construction through instructional reinforcement toward the consolidation of retained knowledge. Consequently, the challenge extends beyond establishing connection in asynchronous learning; it involves understanding how the interrelationship among the three CoI presences can be organized to support both relational engagement and durable knowledge development.

Significance of the Paper

As institutions continue expanding online degree programs, understanding how asynchronous learning environments influence relational engagement becomes increasingly critical (Ong, 2026). Additionally, there should be greater knowledge of appropriate designs and delivery methods to enhance the online learning experience. Addressing this connection gap is essential to improving the overall quality of online education and supporting long-term student success.

Students may benefit from learning environments that intentionally support connection, interaction, and knowledge development, while faculty and instructional designers may benefit from a framework for intentionally structuring asynchronous learning experiences (Chastain et al., 2026). At the organizational level, institutions may benefit from greater clarity regarding how course design and instructional practices can support meaningful engagement and sustained learning. If the connection gap remains insufficiently addressed, asynchronous learning environments may continue to emphasize content access and task completion without adequately supporting the interaction, meaning-making, and reinforcement necessary for deeper and more durable learning (Ncube & Ngulube, 2025).

Existing scholarship provides substantial evidence that asynchronous learning can support flexibility, accessibility, student autonomy, and meaningful academic engagement (Hung et al., 2024), while also identifying challenges associated with social connection and interaction in environments where communication is delayed or primarily text-based (Kangwa et al., 2024). Research examining social, cognitive, and teaching presence within the CoI framework further suggests that intentional interaction, instructional support, reflection, and collaboration are important components of effective online learning experiences (Garrison, 2009; Kangwa et al., 2024). Collectively, this scholarship indicates that successful asynchronous learning involves more than access to content or the efficient exchange of information. It also depends on opportunities for learners to develop meaningful

connections, construct understanding through interaction, and receive instructional guidance throughout the learning process (Gegenfurtner et al., 2026).

Despite these contributions, an important conceptual gap remains. The CoI framework has established social, cognitive, and teaching presence as interrelated elements of the online learning experience (Garrison, 2009), but less attention has been given to conceptualizing how these presences may operate as an iterative process through which engagement develops into meaning construction, instructional reinforcement, and longer-term knowledge retention in asynchronous environments. Existing scholarship has examined individual presences, their relationships with engagement and learning outcomes, and their application to online course design (Lyu, 2024; Yidana & Aboagye, 2024); however, the literature does not yet provide a clearly articulated process model that organizes these elements around the progressive development and consolidation of retained knowledge. This gap raises an important question: how can the three CoI presences be conceptually integrated into a dynamic process that addresses both the relational connection gap and the development of durable knowledge in asynchronous learning environments? This article addresses that question by proposing the CoI Retention Cycle, a conceptual extension of the CoI framework that organizes learning into four iterative phases: engagement, meaning construction, guided reinforcement, and retention consolidation. The proposed framework contributes to the scholarly discussion by reframing CoI from a set of interacting presences into a process-oriented model in which intentional interaction, reflection, and instructional support may contribute to sustained knowledge retention.

Methodology

This article employs a conceptual literature review and integrative framework-development approach to examine how the CoI framework may address the connection gap in asynchronous learning environments and support knowledge retention. The purpose of the review was not to empirically test the proposed framework, but to synthesize relevant theoretical and scholarly literature and use that synthesis to develop a conceptual model extending existing interpretations of CoI. The approach is appropriate because the proposed CoI Retention Cycle is intended as a theoretical and practical framework requiring subsequent empirical examination.

The literature was examined across three primary areas: (1) asynchronous learning and the relational challenges associated with limited real-time interaction; (2) the CoI framework, including social, cognitive, and teaching presence; and (3) engagement, collaborative learning, instructional design, and knowledge retention. Particular attention was given to literature addressing how interaction, reflection, collaboration, instructional support, and repeated engagement contribute to meaningful learning experiences in asynchronous environments. Foundational CoI scholarship, particularly Garrison's work, was considered alongside more recent studies examining the application of CoI in contemporary online learning environments. The manuscript also incorporates literature addressing curriculum design, student engagement, and asynchronous learning to provide context for the proposed framework.

The conceptual synthesis proceeded through four stages. First, the literature was examined to identify recurring challenges associated with asynchronous learning, particularly limitations in relational interaction, collaboration, and connection. Second, the CoI framework was examined to determine how social, cognitive, and teaching presence address these challenges and contribute to meaningful online learning experiences. Third, relationships among the three presences, engagement, meaning-making, instructional reinforcement, and knowledge retention were conceptually integrated. Lastly, these relationships were organized into the proposed CoI Retention Cycle, consisting of four

iterative phases: engagement, meaning construction, guided reinforcement, and retention consolidation.

The resulting framework represents a theoretical proposition rather than an empirically validated model. The CoI Retention Cycle therefore does not claim to establish causal relationships or demonstrate measurable effects on student outcomes. Instead, it provides a process-oriented conceptualization of how the interaction of social, cognitive, and teaching presence may support the development and consolidation of knowledge in asynchronous learning environments. Empirical research is needed to test the proposed relationships, evaluate the sequence and interaction of the four phases, and determine whether the framework produces measurable improvements in engagement, knowledge retention, and academic outcomes across different learning contexts.

Since this article employs a conceptual rather than empirical approach, the proposed relationships among CoI presences and the four phases of the CoI Retention Cycle remain theoretical propositions. The framework is also dependent on the scope and interpretation of the literature synthesized in developing the model.

Conceptual Literature Review & Framework Development

Garrison (2009) highlighted the significance of the CoI Framework in creating an educational online environment through intentional communication, emphasizing that effective learning results from the interaction of the three presences illustrated in Figure 1:

- social presence – the ability of learners to project themselves as real people in the learning community
- cognitive presence – the process through which learners construct meaning through sustained reflection and discourse
- teaching presence – the design, facilitation, and direction of learning by instructors.

It is important to understand the impact of online learning on students and how these impacts affect their social presence, self-regulation, and knowledge retention. Social presence is closely linked to student satisfaction, highlighting the value of flexible asynchronous environments (Ong, 2026). The foundation behind the CoI framework establishes a meticulous theoretical basis for examining how students develop individual meaning and shared understanding in digital environments (Sevnarayan & Vaughan, 2025).

Additionally, student's perceptions of the quality of teaching can impact their cognitive presence. An important factor of CoI is the ability to predict student success in asynchronous environments. Each element is designed to highlight meaningful impact and presence while positively influencing behavioral engagement (Lyu, 2024).

ELEMENTS	CATEGORIES	INDICATORS (examples only)
Social Presence	Open Communication Group Cohesion Personal/Affective	Learning climate/risk-free expression Group identity/collaboration Self projection/expressing emotions
Cognitive Presence	Triggering Event Exploration Integration Resolution	Sense of puzzlement Information exchange Connecting ideas Appling new ideas
Teaching Presence	Design & Organization Facilitating Discourse Direct Instruction	Setting curriculum & methods Shaping constructive exchange Focusing and resolving issues

Figure 1. The elements of the CoI Framework
Source: Redacted Garrison (2009) as presented in the Encyclopedia of Distance Learning, 2nd ed. (pp. 352-355).

Social Constructivist Theory

Social Constructivist Theory complements the CoI framework by providing a theoretical explanation for how learners construct knowledge through interaction, dialogue, collaboration, and shared meaning (Jin et al., 2026; Stenbom et al., 2026). Whereas CoI identifies social, cognitive, and teaching presence as central dimensions of an effective online learning environment, Social Constructivism emphasizes the social processes through which understanding is developed and refined. This perspective is particularly relevant because the proposed CoI Retention Cycle begins with engagement and progresses toward meaning construction, positioning interaction as an important component of the learning process.

Within the proposed framework, Social Constructivism provides theoretical support for the relationship between engagement and meaning construction, particularly the role of interaction and shared meaning in knowledge development.

Self-Regulated Learning Theory

Self-Regulated Learning Theory provides a complementary learner-centered perspective for understanding how knowledge may be processed, monitored, reinforced, and applied over time (Adhya & Panda, 2026). While CoI emphasizes the social, cognitive, and teaching dimensions of the online learning environment, and Social Constructivism emphasizes knowledge construction through interaction, Self-Regulated Learning focuses on the learner's active role in regulating learning processes. This perspective is relevant because asynchronous learning requires learners to manage attention, reflection, engagement, and application with less reliance on simultaneous instructor and peer interaction (Adhya & Panda, 2026; Tang et al., 2026).

Within the proposed CoI Retention Cycle, Self-Regulated Learning provides theoretical support for the progression from meaning construction through guided reinforcement and toward retention consolidation. Reflection, monitoring, feedback, strategy use, and application represent learner-level processes through which knowledge may be strengthened and transferred across learning contexts.

Taken together, the three theoretical perspectives provide complementary explanations for the proposed CoI Retention Cycle. CoI establishes the overarching framework for understanding the social, cognitive, and teaching conditions of asynchronous learning (Tirado-Morueta et al., 2026). Social Constructivism explains how interaction and shared meaning contribute to knowledge construction (Li et al., 2026), while Self-Regulated Learning explains how learners actively process, monitor, reinforce, and apply knowledge (Adhya & Panda, 2026). The CoI Retention Cycle integrates these perspectives into a process-oriented conceptualization consisting of engagement, meaning construction, guided reinforcement, and retention consolidation. The framework retains CoI as a primary theoretical foundation while drawing on complementary theories to explain mechanisms that extend beyond the original framework.

CoI has demonstrated significant potential to foster successful academic and behavioral changes in asynchronous environments. Garrison (2009) posited that each element focuses on creating an educational experience that transcends basic communication and instruction, but also facilitates collaboration that engages in exploring ideas, creating meaning, and confirming comprehension. Aylwin (2019) suggested that there are several benefits to implementing CoI elements in asynchronous environments, including:

- an enhanced learning community
- reduced isolation
- improved critical thinking
- increased motivation, engagement, and retention
- and efficient support for varying learning styles.

This article develops a conceptual extension of the CoI framework to address the connection gap in asynchronous learning environments. The proposed CoI Retention Cycle conceptualizes social, cognitive, and teaching presence as interconnected components of an iterative learning process organized around engagement, meaning construction, guided reinforcement, and retention consolidation. By integrating these elements, the framework offers a process-oriented lens for examining how intentional interaction and instructional design may support durable knowledge retention in asynchronous learning environments.

Online learning has emerged as a transformative force in higher education, expanding access, flexibility, and opportunity for an increasingly diverse student population (Green, 2024). By removing geographic and scheduling barriers, asynchronous environments enable learners to engage with course content in ways that align with their individual responsibilities and learning preferences (Green, 2024). This flexibility not only supports persistence among nontraditional students but also fosters greater autonomy and self-directed learning. Additionally, well-designed online courses can leverage digital tools to promote reflection, discussion, and continuous engagement, creating opportunities for meaningful learning experiences that extend beyond the constraints of traditional classroom settings (Green, 2025).

Figure 2 shows that over the past two decades, online courses have become a routine part of the student experience, with many learners incorporating at least some virtual coursework into their academic pathways. This trajectory intensified dramatically in 2020 as the COVID-19 pandemic compelled institutions worldwide to transition rapidly to remote instruction, accelerating adoption at an unprecedented scale.

Although this rapid expansion has moderated in the years since the initial disruption, online learning remains significantly more prevalent than it was prior to 2020. This sustained elevation reflects not only a shift in institutional delivery models but also a lasting change in student expectations for flexibility, accessibility, and digitally supported learning environments. As a result, online education has moved from a supplemental option to a central component of contemporary higher education.

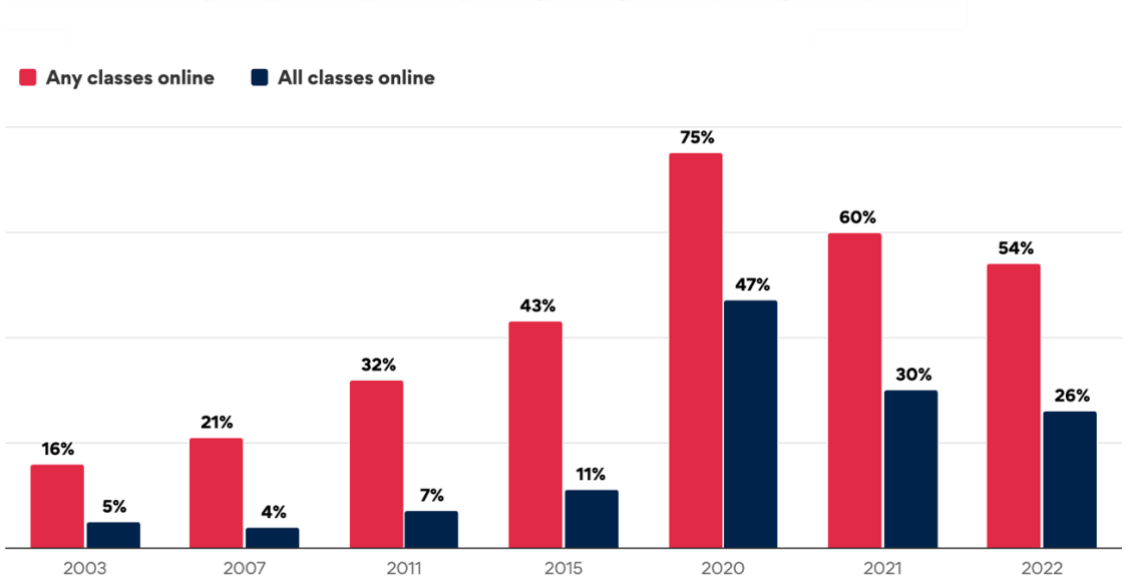

Figure 2. Percentage of Undergraduates in Online Classes in Selected Years
Source: Redacted from Best Colleges (2024)

Figure 3 indicates that online graduate enrollment experienced a significant surge in Spring 2024, marking a pronounced acceleration compared to the preceding two years and underscoring a growing reliance on flexible, advanced degree pathways. While undergraduate online enrollment also increased during this period, its growth was more

gradual, suggesting that the most substantial momentum in online education is occurring at the graduate level. Universities are projecting higher online enrollments in the coming years. Such movement highlights the need for consistent, reliable strategies that target and explore academic and behavioral improvements (Errabo & Sales, 2024).

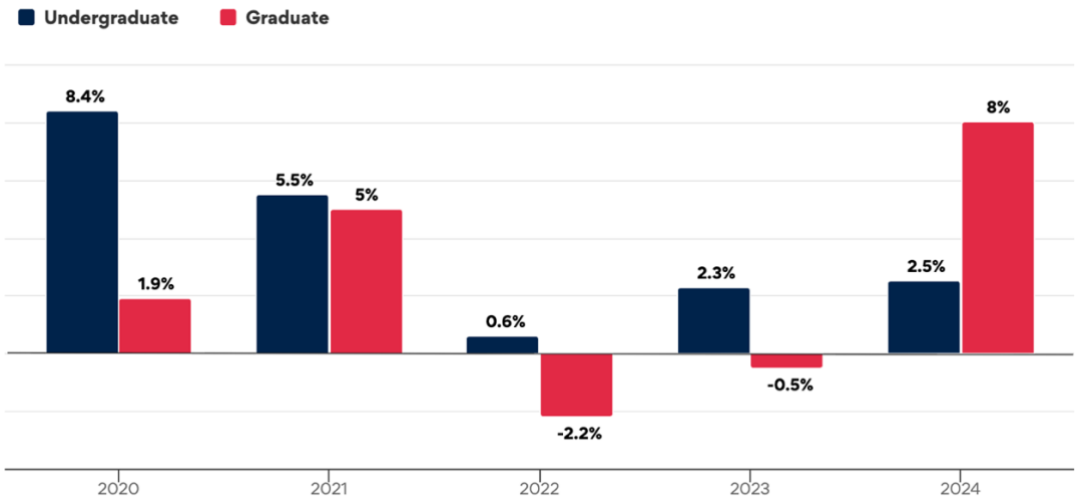

Figure 3. Online Enrollment Growth by Degree Level, Spring Semesters
Source: Redacted from Best Colleges (2024)

The concept of a connection gap extends this perspective by suggesting that while asynchronous platforms facilitate efficient information exchange, they may simultaneously limit the relational depth necessary for sustained academic engagement. When students interact primarily through structured discussion boards, written assignments, and delayed communication, the learning environment may emphasize task completion over relational interaction (Mu, 2026). As a result, students may remain cognitively involved in coursework while experiencing reduced interpersonal connections with peers and instructors (Mu, 2026; Green, 2024). This condition can weaken collaborative learning dynamics and diminish the sense of belonging that often supports persistence in academic programs (Qian & Papi, 2026).

CoI moves past simple information access and emphasizes the components of an educational experience that support building learner communities actively and collaboratively engaged in inquiry, meaning-making, and shared understanding. In doing so, the CoI framework foregrounds the intentional integration of social, cognitive, and teaching presence as essential conditions for deep and sustained learning. Rather than positioning learners as passive recipients of content, CoI situates them as active participants in a dynamic learning ecosystem where dialogue, reflection, and facilitation intersect (Stenbom et al., 2026). This integration not only strengthens knowledge construction but also cultivates trust, accountability, and intellectual engagement. These elements are particularly critical in asynchronous environments where connections must be deliberately designed rather than assumed (Yu & Abdrahim, 2026).

Curricula Design & CoI

Well-designed curricula play a critical role in enhancing student retention and engagement (Green, 2025). There is a significant statistical connection between curricula and cognitive, social, and teaching presences (Yidana & Aboagye, 2024). Thoughtful development and alignment of the curriculum across each stage of the academic journey support smoother year-to-year progression by fostering continuous skill development and academic advancement (Prince, 2019). When grounded in the CoI framework, curriculum design becomes even more impactful by intentionally integrating social, cognitive, and teaching

presence throughout the learning experience. This alignment ensures that students are not only acquiring knowledge but are also actively engaging in meaningful discourse, reflection, and collaboration.

By embedding CoI principles into curriculum design, institutions can move beyond content delivery to create structured opportunities for connection, interaction, and shared meaning (Stenbom et al., 2026). These are critical components for addressing the connection gap in asynchronous environments. As a result, students are more likely to feel a sense of belonging, remain engaged in their coursework, and persist through program completion. In this way, curriculum is not simply a roadmap for learning, but a strategic mechanism for cultivating sustained engagement, deeper learning, and long-term student success in online education. Building on this foundation, the CoI framework is particularly powerful in asynchronous environments because it compensates for the absence of real-time interaction through intentional design. Where social presence fosters authentic connection, cognitive presence drives sustained inquiry and reflection, and teaching presence provides the structure and facilitation necessary to guide learning (Garrison, 2009). Together, these elements transform asynchronous learning from an isolated, task-oriented experience into a cohesive and interactive academic community.

This integrated approach directly addresses the connection gap by ensuring that presence is not incidental but deliberately cultivated throughout the learning experience. In environments where students may never meet face-to-face, the intentional design of interaction fosters trust, accountability, and intellectual engagement (Kangwa et al., 2024). When students feel seen, supported, and challenged, they are more likely to remain actively engaged and persist through academic challenges. As such, the CoI framework functions not only as a theoretical lens but as a practical design strategy that strengthens relational depth, enhances learning quality, and ultimately supports student success in asynchronous education (Yu & Abdrahim, 2026).

Collaborative Techniques

Effective collaboration in asynchronous environments requires intentional design strategies aligned with the CoI framework to ensure interaction is both meaningful and sustained (Olesova et al., 2026). One of the most impactful techniques is the use of structured discussion protocols that move beyond surface-level participation. Rather than asking students to simply respond to prompts, instructors can design layered discussions that require initial analysis, peer response, and reflective synthesis. This approach strengthens cognitive presence by encouraging deeper inquiry and enhances social presence as students engage with one another's perspectives in a purposeful, ongoing manner (Irugalbandara et al., 2026). When supported by clear expectations and facilitation, these discussions become central spaces for collaborative knowledge construction rather than isolated postings.

Another effective strategy involves integrating collaborative learning artifacts, such as shared documents, group annotations, and co-developed presentations. These tools allow students to work collectively over time, contributing ideas, refining interpretations, and building upon each other's insights asynchronously. This process reinforces teaching presence through intentional design and guidance (Kangwa et al., 2024), while fostering cognitive presence as learners engage in problem-solving and meaning-making (Gao et al., 2020). Importantly, these collaborative artifacts create visible evidence of group learning, helping students recognize their role within a shared intellectual process and strengthening accountability across the learning community.

The use of peer feedback loops further enhances CoI integration by embedding continuous interaction into the learning experience. Structured peer review activities, where students evaluate each other's work using guided criteria, promote critical thinking and reflective engagement (Chen, 2026). This technique not only deepens cognitive presence through evaluation and revision (Gao et al., 2020) but also builds social presence by

encouraging respectful, constructive dialogue (Irugalbandara et al., 2026). When instructors actively model and scaffold effective feedback practices, teaching presence becomes evident in the facilitation of high-quality exchanges that support both individual improvement and collective learning (Kangwa et al., 2024).

Scaffolded group projects designed specifically for asynchronous environments provide a comprehensive approach to integrating all three CoI presences. By breaking projects into phases, such as planning, collaboration, feedback, and revision, students remain consistently engaged over time while developing both academic and interpersonal skills. Clear instructor guidance, milestone deadlines, and opportunities for reflection ensure that teaching presence remains visible, while sustained interaction supports social presence and deeper engagement with content that strengthens cognitive presence. Through these intentionally designed collaborative techniques, asynchronous learning environments can move beyond transactional engagement to cultivate dynamic, connected, and intellectually rigorous learning communities.

Knowledge Retention & CoI

The CoI framework provides a conceptual basis for supporting knowledge retention in asynchronous learning by moving learners beyond passive content exposure toward active meaning-making. Cognitive presence facilitates this process through exploration, integration, and resolution, allowing learners to revisit, apply, and refine concepts through sustained inquiry (Garrison, 2009). When these processes are intentionally embedded in asynchronous course design, learning may extend beyond initial content acquisition toward deeper and more durable knowledge development (Aylwin, 2019).

Social presence complements cognitive presence by supporting knowledge construction through interaction and collaborative meaning-making. When learners articulate ideas, respond to peers, and negotiate meaning, asynchronous interaction can become a shared process of learning rather than an isolated task (Garrison, 2009). Intentionally designed peer activities, such as threaded synthesis discussions and cumulative dialogue prompts, can encourage learners to revisit and reconstruct knowledge across the learning process (Ncube & Ngulube, 2025).

Teaching presence supports knowledge development by structuring learning through intentional sequencing, targeted prompts, feedback, and instructional guidance. By revisiting key concepts across modules through feedback, summary posts, and integrative assignments, instructors can reinforce connections between prior and new learning (Garrison, 2009). This deliberate scaffolding can help maintain continuity and support the progressive development of understanding in asynchronous environments (Kangwa et al., 2024).

The integration of all three presences ultimately creates a learning environment where retention is an outcome of design, not chance. Asynchronous environments that leverage CoI move beyond static content delivery and instead cultivate sustained engagement, iterative learning, and meaningful connection to content (Garrison, 2009; Yidana & Aboagye, 2024). In this model, students are not simply memorizing information for assessment; they are internalizing knowledge through repeated interaction, reflection, and application, which are processes that are essential for long-term academic success (Lyu, 2024).

The CoI framework is traditionally examined as a set of interrelated presences; however, in asynchronous environments, its value can be understood through a dynamic, cyclical process that supports sustained learning. The CoI Retention Cycle extends this perspective by conceptualizing social, cognitive, and teaching presence as sequential yet interconnected components of knowledge retention. As illustrated in Figure 4, the model positions engagement, meaning construction, guided reinforcement, and retention consolidation as iterative phases that collectively transform interaction into durable learning.

By reframing CoI as a retention-oriented process rather than a static framework, the model offers a more actionable approach to designing asynchronous learning experiences that support long-term academic success.



Figure 4. CoI Retention Cycle
Source: Created by the author to demonstrate the impact Garrison's et al. CoI elements have on college students' engagement in sustained knowledge retention in asynchronous learning environments.

Engagement, grounded in social presence, represents the initial phase of the retention process in which learners establish cognitive and interpersonal entry points into the learning environment. In asynchronous contexts, this phase is critical because the absence of physical immediacy requires intentional design to foster visibility, identity projection, and relational connection. Through structured dialogue, peer interaction, and opportunities for self-expression, learners move beyond passive observation and begin actively encoding information. Incorporating early interactive, dialogue-rich learning opportunities is critical to ensuring effective engagement and high performance (Liu, 2026). This early engagement supports attention and motivation, both of which are foundational to memory formation, by situating learning within a socially constructed context. When students perceive themselves and others as real participants in a shared academic space, they are more likely to invest effort, sustain participation, and initiate the cognitive processes necessary for deeper learning.

Meaning construction, aligned with cognitive presence, advances learning through sustained inquiry, reflection, and the integration of ideas. In this phase, learners engage in higher-order thinking processes that move beyond comprehension toward analysis, synthesis, and application. Asynchronous environments are particularly well-suited for this stage, as they allow time for deliberate reflection and iterative engagement with content and peer perspectives. Structured activities such as problem-based discussions, reflective prompts, and applied tasks encourage learners to connect new information with prior knowledge, strengthening conceptual frameworks. This process is essential for knowledge retention

because it transforms information into personally constructed meaning, increasing the likelihood that learning will be retained.

Guided reinforcement, anchored in teaching presence, ensures that learning is continuously supported and strengthened through intentional instructional design and facilitation. In this phase, instructors play a critical role in shaping the learning trajectory by providing targeted feedback, scaffolding complex concepts, and reinforcing key ideas across learning activities. Rather than serving solely as content deliverers, instructors act as facilitators of cognitive development, intervening strategically to address misconceptions and deepen understanding. In asynchronous settings, this reinforcement often occurs through written feedback, summary posts, and structured check-ins, all of which contribute to repeated exposure and elaboration of content. These instructional interventions are essential for retention, as they help stabilize knowledge structures and ensure that learning remains coherent and cumulative rather than fragmented.

Retention consolidation represents the culmination of the CoI Retention Cycle, where social, cognitive, and teaching presence converge to solidify learning into long-term memory. This phase emphasizes the importance of synthesis, application, and repeated engagement as mechanisms for reinforcing knowledge over time. Through integrative activities, such as cumulative discussions, reflective summaries, and capstone assignments, learners revisit and reorganize previously encountered concepts, strengthening their ability to recall and apply knowledge in new contexts. The integration of all three presences ensures that learning is not only cognitively processed but also socially reinforced and instructionally supported. As a result, knowledge becomes embedded within a network of experiences and interactions. In asynchronous environments, where learning unfolds over extended periods, this phase is particularly critical for transforming episodic engagement into sustained academic growth.

Collectively, these four phases illustrate that knowledge retention in asynchronous environments is not the result of isolated instructional strategies, but the outcome of a deliberately integrated and iterative learning process. The CoI Retention Cycle demonstrates how engagement initiates learning, how meaning construction deepens understanding, how guided reinforcement stabilizes knowledge, and how retention consolidation ensures long-term application. By positioning these elements as interconnected rather than discrete, the model underscores the necessity of designing learning experiences that continuously build upon prior interactions. This integrated approach not only strengthens cognitive outcomes but also reinforces the relational and instructional conditions required for sustained academic success. The CoI Retention Cycle provides a structured pathway for transforming asynchronous learning from a passive experience into a dynamic process that supports enduring, meaningful learning.

Conclusion

The primary objective of this article was to examine how the intentional application of CoI framework can address the connection gap in asynchronous learning environments and strengthen relational engagement and knowledge retention. This objective has been addressed through a conceptual analysis of how social, cognitive, and teaching presence function collectively to transform online learning from a transactional experience into a sustained, interactive process. When these elements are deliberately integrated into curriculum design and instructional practices, they may support engagement, deeper learning, and longer-term knowledge retention. In doing so, effective asynchronous learning is not dependent on modality alone, but on the quality and intentionality of its design.

Several conceptual patterns emerge from the literature synthesis. First, asynchronous environments that rely solely on content delivery and task completion tend to limit relational depth, resulting in reduced engagement and persistence. Second, the integration of structured interaction, collaborative techniques, and continuous feedback creates conditions where

learners are more actively involved in meaning-making processes. Third, the literature suggests that knowledge retention may be supported when learning experiences are iterative and require students to revisit, apply, and reflect on content over time. These patterns collectively suggest that sustained learning may depend on repeated engagement and intentional instructional design rather than isolated learning activities. The proposed CoI Retention Cycle provides a conceptual advancement by organizing engagement, meaning construction, guided reinforcement, and retention consolidation as interconnected phases through which the three CoI presences may operate over the course of asynchronous learning.

The scientific value of this study lies in its extension of the CoI framework from a descriptive model of interaction to a process-oriented model of knowledge retention. By reframing CoI as a cyclical mechanism, this work contributes to a deeper theoretical understanding of how learning occurs in asynchronous environments. From a practical perspective, the study offers actionable strategies for educators and institutions:

1. Design intentionally for social connection

Faculty and instructional designers should incorporate structured opportunities for meaningful learner interaction, including purposeful discussion, peer exchange, and collaborative activities. This recommendation directly addresses the connection gap by strengthening the social dimension of asynchronous learning rather than relying primarily on individual content consumption and assignment completion.

2. Design activities around meaning construction

Asynchronous learning activities should require learners to interpret, connect, question, reflect upon, and apply information. Such activities align with cognitive presence and the proposed meaning-construction phase by moving learners beyond participation toward active knowledge development.

3. Build guided reinforcement into the learning process

Faculty should incorporate timely feedback, scaffolding, clarification, modeling, and opportunities to revisit important concepts. These practices correspond with teaching presence and the guided-reinforcement phase of the CoI Retention Cycle.

4. Incorporate self-regulated learning opportunities

Instructional design should provide opportunities for learners to monitor their understanding, reflect on their learning strategies, respond to feedback, and apply knowledge across activities. This recommendation reflects the complementary role of Self-Regulated Learning Theory in explaining learner-level processes within the proposed framework.

5. Design for knowledge consolidation

Asynchronous courses should distinguish assignment completion from knowledge consolidation. Opportunities to synthesize, revisit, retrieve, and apply previously introduced concepts should be intentionally incorporated throughout the course to support the retention-consolidation phase.

6. Integrate, rather than isolate, the three CoI presences

Faculty and instructional designers should examine social, cognitive, and teaching presence as interconnected dimensions of course design. Activities can be intentionally sequenced so that social interaction supports engagement, cognitive activity supports meaning construction, and instructional guidance supports reinforcement and consolidation.

7. Use the CoI Retention Cycle as a design and evaluation lens

The proposed framework can be used as a conceptual lens for examining whether an asynchronous course provides opportunities for engagement, meaning construction, guided reinforcement, and retention consolidation. This application may help educators identify gaps in course design and provide a structured basis for subsequent empirical evaluation.

These recommendations have implications for multiple stakeholders in asynchronous education. Faculty can use the framework to structure interaction, feedback, reflection, and application; instructional designers can use it to evaluate the alignment of course activities with the three CoI presences; and institutions can consider the framework when developing professional-development initiatives and quality standards for asynchronous courses. For learners, the framework emphasizes opportunities to participate actively in knowledge construction and to engage in reflective and self-regulated learning processes.

Despite its contributions, this study is not without limitations. The analysis is conceptual in nature and does not include empirical testing of the proposed CoI Retention Cycle. As a result, while the model is theoretically grounded, further validation is needed to measure its effectiveness across diverse learning contexts and student populations. Additionally, variations in institutional resources, technological infrastructure, and instructor readiness may influence the extent to which these strategies can be implemented consistently. These limitations suggest that the application of the framework may require adaptation based on specific educational settings.

Recommendations for Future Research

Future research should focus on empirically testing the CoI Retention Cycle to evaluate its impact on student engagement, knowledge retention, and academic performance in asynchronous environments. Quantitative and qualitative studies could examine how different implementations of CoI-informed design influence learner outcomes across disciplines and program levels. Additionally, further exploration is needed to understand how emerging technologies, such as adaptive learning systems and artificial intelligence, can support or enhance the integration of CoI principles. Investigating the long-term effects of sustained CoI-based learning experiences on student success and career readiness would also provide valuable insights.

This review reinforces the importance of intentional design in asynchronous learning and provides a structured framework for addressing the connection gap. By positioning engagement, interaction, and reinforcement as central components of the learning process, the CoI framework, and its extension through the CoI Retention Cycle, offers a conceptual pathway for examining how asynchronous learning can be designed to foster connection, deepen understanding, and support lasting knowledge. As asynchronous learning continues to evolve, the ability to design experiences that foster connection, deepen understanding, and support lasting knowledge will remain essential to advancing student success.

References

Adhya, D. H., & Panda, S. (2026). An integrative systematic review analysis of research on technology-enabled personalized learning and self-regulated learning. *Smart Learning Environments*, *13*(1), 1–26. https://doi.org/10.1186/s40561-025-00428-8

Aylwin, C. (2019). Faculty and student interaction in an online Master's course: Survey and content analysis. *JMIR Publications, 5*(1), 1–13. https://doi.org/10.2196/10464

Best Colleges. (2025, June). *Online learning statistics*. https://www.bestcolleges.com/research/online-learning-statistics/#enrollment-statistics

Best Colleges. (2024, June). *Online college programs drive spring 2024 enrollment growth*. https://www.bestcolleges.com/news/online-college-drives-spring-enrollment-growth/

Chastain, J., Stork, M. G., & Wang, C. X. (2026). Exploring virtual student-faculty partnerships: A narrative inquiry for learning experience design. *TechTrends*, *70*(2), 364–375. https://doi.org/10.1007/s11528-025-01153-2

Chen, X. (2026). Developing critical thinking through scaffolded peer feedback: an action research on heuristic design. *Frontiers in Psychology*, *17*(1), 1–12. https://doi.org/10.3389/fpsyg.2026.1711768

Errabo, D. D., & Sales, J. V. (2024). Evaluating Community of Inquiry's effectiveness in online Science Instruction. *AsTEN Journal of Teacher Education*, *8*(1), 89–105. https://doi.org/10.56278/asten.v8i.2768

Gao, N., Shao, W., Rahaman, M. S., & Salim, F. D. (2020). N-gage: Predicting in-class emotional, behavioural and cognitive engagement in the wild. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, *4*(3), 1–26. https://doi.org/10.1145/3411813

Garrison, D. R. (2009). Communities of Inquiry in Online Learning. In P. Rogers, G. Berg, J. Boettcher, C. Howard, L. Justice, & K. Schenk (Eds.), *Encyclopedia of Distance Learning, Second Edition* (pp. 352–355). IGI Global Scientific Publishing. https://doi.org/10.4018/978-1-60566-198-8.ch052

Gegenfurtner, A., Alijagic, A., Gabel, S., & Keskin, Ö. (2026). Synchronous online learning supports cognitive and affective outcomes more than traditional face-to-face and asynchronous online education: A meta-analysis of webinars. *Learning and Individual Differences*, *126*(1), 1–8. https://doi.org/10.1016/j.lindif.2025.102862

Green, D. N. (2024). Adult learners: Connecting Andragogy and Transformational Leadership in the Classroom. *Business Ethics and Leadership, 8*(4), 137–147. https://doi.org/10.61093/bel.8(4).137-147.2024

Green, D. N. (2025). Student retention or high academic standards: The HBCU crusade. *Knowledge Economics and Lifelong Learning*, 1(2), 1–10. https://doi.org/10.61093/kell.1(2).1-10.2025

Hung, C. T., Wu, S. E., Chen, Y. H., Soong, C. Y., Chiang, C. P., & Wang, W. M. (2024). The evaluation of synchronous and asynchronous online learning: Student experience, learning outcomes, and cognitive load. *BMC Medical Education*, *24*(1), 326 – 334. https://doi.org/10.1186/s12909-024-05311-7

Irugalbandara, T. C., Watson, J., Wright-Brough, F., Fernando, S., & Myers, T. (2026). Strategies for enhancing social presence and well-being in online learning: A conceptually led systematic literature review. *Journal of Information Technology Education: Research*, *25*(9), 1–35. https://doi.org/10.28945/5732

Jin, Z., Jinglu, L., & Ran, W. (2026). Investigating synchronous interaction behaviours among open university students: A latent profile analysis and epistemic network analysis. *Journal of Computer Assisted Learning*, *42*(6), 1–13. https://doi.org/10.1002/jcal.70339

Kangwa, D., Xiulan, W., Msambwa Msafiri, M., & Fute, A. (2024). Enhanced learning engagement through teaching presence in online distance education. *Distance Education*, *45*(4), 497–514. https://doi.org/10.1080/01587919.2024.2347998

Li, M., Xu, N., & Liang, Y. (2026). Social reality as a phenomenological construct: Understanding Intersubjectivity through the Lens of shared meaning. *Integrative Psychological and Behavioral Science*, *60*(1), 1–17. https://doi.org/10.1007/s12124-026-09987-y

Liu, Y. (2026). From presence to performance: An empirical study of College English online learning through the CoI Lens. *International Journal of Education and Humanities*, *6*(1), 54–67. https://doi.org/10.58557/(ijeh).v6i1.396

Lyu, B. (2024). The effect of self-regulated learning and Community of Inquiry on the online learning engagement of Chinese as foreign language learners. *Education Sciences*, *14*(7), 691–705. https://doi.org/10.3390/educsci14070691

Mu, R. (2026). The influence of role assignment strategy on learning engagement, learning outcomes, and perceptions in asynchronous discussion groups. *Instructional Science*, *54*(1), 1–16. https://doi.org/10.1007/s11251-025-09768-x

Ncube, M. M., & Ngulube, P. (2025). Enhancing social presence in asynchronous instruction: A focus on a higher education institution in Zimbabwe. *South African Journal of Libraries and Information Science*, *91*(1), 1–11. https://hdl.handle.net/10520/ejc-liasa_v91_n1_a6

Olesova, L., Sadaf, A., & Yan, W. (2026). Exploring Relationships Between Undergraduate Students' Perceived Community of Inquiry, Engagement, and Shared Metacognition in Asynchronous Online Courses. *Technology, Knowledge and Learning*, *31*(1), 383–407. https://doi.org/10.1007/s10758-026-09953-y

Ong, D.P. (2026). Social presence in flexible online courses: Links to learning and student satisfaction. *Education and Information Technologies, 31*(1), 419–446. https://doi.org/10.1007/s10639-025-13823-y

Prince, C. B. (2019). Retention through curriculum development: A UK case study. In *Examining Student Retention and Engagement Strategies at Historically Black Colleges and Universities* (pp. 128–148). IGI Global. https://doi.org/10.4018/978-1-5225-7021-9.ch008

Qian, Y., & Papi, M. (2026). Interaction-seeking behavior in second language learning: The Role of Regulatory Modes. *International Journal of Applied Linguistics*, *4*(1), 1–22. https://doi.org/10.1111/ijal.70362

Sevnarayan, K., & Vaughan, N. (2025). Shared Metacognition, Collaboration and the Community of Inquiry Framework in Action. *COMPETITIVE: Journal of Education*, *4*(3), 305–327. https://doi.org/10.58355/competitive.v4i3.183

Stenbom, S., Garrison, D. R., & Bozkurt, A. (2026). Augmenting inquiry, preserving the core: Stenbom and Garrison on AI's role and human centered learning within the Community of Inquiry (CoI) framework. *Open Praxis*, *18*(1), 181–191. https://doi.org/10.55982/openpraxis.18.1.1042

Tang, Y., Liao, L., Wen, C., & Wang, Y. (2026). One size doesn't fit all: Exploring functional expectations and learner typologies for learning analytics in self-regulated learning. *Education and Information Technologies*, *31*(10), 3475–3509. https://doi.org/10.1007/s10639-026-13936-y

Tirado-Morueta, R., Illanes-Segura, R., Moro, J. C. I., & Duarte-Hueros, A. M. (2026). Temporal Dynamics of Online Learning Interactions: A Learning Analytics Study within the CoI Framework. *Computers and Education Open, 11*(1), 1–13. https://doi.org/10.1016/j.caeo.2026.100398

Yidana, M. B., & Aboagye, G. K. (2024). Towards developing a 21st century curriculum through the perspective of the Community of Inquiry (CoI) framework. *Cogent Social Sciences*, *10*(1). 1–19. https://doi.org/10.1080/23311886.2024.2364387

Yu, W., & Abdrahim, N. A. (2026). Learning online through Community of Inquiry and Culturally Responsive Teaching (COI-CRT) Framework: Insights from Chinese students studying in Malaysian higher education. *Journal of Institutional Research South East Asia*, *24*(1), 693–704.