



Instructor Perspectives on Building Community in Online Discussion-Based Courses: Issues of Pedagogy and Functionality

*Kimberley MacKinnon, Alexandra Makos, Lesley Wilton,
Clare Brett, Taru Malhotra, Teresa Avery, Preeti Raman*

Abstract: Education in this digital age is at a pivotal moment, as technological capability, accessibility, and increased financial pressure on educational institutions make online courses particularly attractive for both students and institutions. The growing pervasiveness of online learning across educational sectors brings forth the need to carefully identify the most promising opportunities and widespread challenges for maximizing student experience in online learning environments (Brett, 2016). In this study, three expert practitioners will analyze their research using PeppeR, a web-based collaborative workspace designed to promote learning within an online community. The analysis is meant to elicit recommendations that may be useful for building online courses in which collective meaning-making is an intentional goal. Analyses provide a practical synthesis of research-based insights gained from the daily challenges of over a decade of teaching and learning online. Several themes emerged from the review and emphasize the importance of different aspects of pedagogical design, communication, and evaluation. Different forms of modalities, strategies, and customization in the learning management system are discussed, including personalized messaging, instructor videos, and use of hashtags.



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Keywords: interaction, design, online learning, presence

Résumé: L'éducation en cette ère numérique se trouve à un moment charnière, car la capacité technologique, l'accessibilité et la pression financière accrue sur les établissements d'enseignement rendent les cours en ligne particulièrement attrayants pour les deux étudiants et les établissements. L'omniprésence croissante de l'apprentissage en ligne dans les secteurs de l'éducation met en avant évidence la nécessité d'identifier soigneusement les opportunités les plus prometteuses et les défis les plus répandus pour maximiser l'expérience des étudiants dans les environnements d'apprentissage en ligne (Brett, 2016). À l'aide de PeppereR, un espace de travail collaboratif basé sur le Web conçu pour promouvoir l'apprentissage au sein d'une communauté en ligne, dans cette étude, trois praticiens experts analyseront leurs recherches et leurs pratiques en ordre de obtenir des recommandations qui pourraient être utiles pour construire des cours en ligne dans lesquels la prise de sens collective est un objectif intentionnel. Les analyses fournissent une synthèse pratique des connaissances basées sur la recherche tirées des défis quotidiens de plus d'une décennie d'enseignement et d'apprentissage en ligne. Plusieurs thèmes se dégagent de la revue et soulignent l'importance de différents aspects de la conception pédagogique, de la communication et de l'évaluation. Différentes formes de modalités, de stratégies et de personnalisation dans le système de gestion de l'apprentissage discuté, y compris la messagerie personnalisée, les vidéos de l'instructeur et l'utilisation de hashtags, etc.

Mots clés: interaction, conception, apprentissage en ligne, présence

Introduction

We are at a pivotal moment: globally, learners and educators are increasingly compelled to reconsider how education can work through different mediums and modalities. Online learning takes place in a virtual environment enabled by the internet. Ideally, by virtue of being online, there is greater scope for the individual and learning community to leverage the interactive nature of the Web by exploring a variety of knowledge domains that are meaningful to them (Dede, 1996; Jonassen, 1996; Nandi et al., 2012; Vrasidas, 2000; Vrasidas & Glass, 2007). Instructors play a key role in working towards actualizing this potential, by being mindful of research-informed practices that have shown to either strengthen or compromise the integrity of the collective synergies and sense of inclusiveness in their online courses (Young, 2014).

Learner interaction is one of the most critical components of distance education courses (Jung et al., 2002; Kang & Im, 2013; Moore, 1989; Woo & Reeves, 2007). By exchanging ideas and information with their peers and instructor(s), students can construct new knowledge and develop a deeper understanding of key concepts. As post-secondary institutions cope with the rapid growth of online courses, and an increase in the cultural diversity of learners it is critical to understand, at a detailed level, the relationship between online interaction and learning, and how educationally effective interactions might be nurtured by instructors.

While the Community of Inquiry (CoI) framework (Garrison et al., 2000; Garrison, 2009) has been well established over the past twenty years as a way to contextualize important elements of online community that influence interaction and learning, Castellanos-Reyes (2020) claims there is still some disagreement about which factors ought to be included, with some researchers arguing for additional elements beyond the three presences (i.e., social, cognitive, and teaching presence) such as, emotional presence, learner presence, and autonomy presence. Furthermore, there is still little

consensus in the online teaching literature about how these factors ought to be enacted in practice, in ways that best support meaningful intellectual inquiry within online communities. This paper specifically addresses the latter issue.

As part of ongoing research about interactions in online learning, the PepperR team has been uniquely involved in the intentional interweaving of technological and pedagogical design work, as the designers are also end-users of the platform. PepperR is a platform that was developed not only as an institutional online teaching platform, but also as a research tool for exploring how to build online communities (see <https://pepperproject.ca>). At this pivotal time, and as part of identifying how learning can be maximized in online environments, we have collated some of the best practices that have emerged from ten years of research and teaching in online discussion-based courses using this platform.

This practical paper is a way to extend the ongoing work of the PepperR team by considering the ways that our research is enacted in the practice of our online teaching. In other words, our objective is to describe how the research on supporting intellectual inquiry within online communities through PepperR—and through the intentional application of the CoI framework—has been applied within our technological and instructional design work. To accomplish this, we engaged in a series of focus group discussions with instructors who have been deeply involved in both the empirical research and teaching aspects of PepperR's development. Specifically, we invited them to articulate how the broader ideas uncovered through research and practice played out in the day-to-day activities within their online courses, and in particular, how they actively promoted the key presences of the CoI model (teaching, social, cognitive) (Garrison et al., 2000).

Although this paper attempts to elucidate some key ideas for supporting intellectual inquiry in online communities through the lens of our design work using the PepperR

platform, it is not our intent to suggest generalizable conclusions. Rather, we expect that the results will prove as a useful comparison for other online teaching contexts in which the CoI framework is intentionally applied.

Theoretical Framework

Our current global situation has thrust us into a place and time where online learning will be an ever-more necessary mode of engagement. Stepping back from the micro level of discussions and examining the online environment as a whole, has become useful for exploring how instructors and learners become acquainted with adapting their communication skills. This includes communication from face-to-face and computer-mediated experiences in informal contexts (e.g., communicating through social media) to more formal academic contexts, where there is an intentional focus on building knowledge.

Researchers have argued that proficiency and skill with using the internet does not alone determine a student's ability to learn effectively in an online environment; rather, it is their ability to adapt to the system being used (Eastin & LaRose, 2000). Discussion-based learning can be difficult in online learning environments because of the lack of aural and visual cues (Kreijns et al., 2013). Yet, research on PeppeR and the various tools integrated in the system reveals that environments that include low-cost mechanisms that can augment and scaffold discussion in more adaptive ways allow students to engage in alternative ways to support learning. As students become more comfortable with interacting and engaging with each other through computer-mediated technologies, it is conceivable that these skills can be transferred to an academic context.

Constructivism

The theoretical frames in this project start with an understanding of learning and teaching that is based in social constructivism. Learning in this frame is understood as an active form of meaning-making by the learner. To support this, effective teachers

recognize that learners construct their understanding and that both teaching and learning are part of a reciprocal dialectical process (Darabi et al., 2011; Rodriguez, 2014). From a constructivist point of view, one of the core objectives of online discussion is the intentional effort of working towards meaningful discourse and building a lasting understanding of course topics (Garrison et al., 1999; Oztok et al., 2014; Rourke & Kanuka, 2009). In a Knowledge Building (KB) online community, this intentionality is described as having a sense of *collective cognitive responsibility* for the construction of new knowledge (Scardamalia, 2002; Scardamalia & Bereiter, 2006, 2014).

Ultimately, in thinking about how to support online learners with their efforts to construct understanding and engage in knowledge building, both social interaction and individual elements of learning need to be considered (Dewey, 1998, 1938; Vygotsky, 1978). Dewey (1910) reminds us that, “[t]hinking is not a case of spontaneous combustion; it does not occur just on “general principles.” There is something specific which occasions and evokes it” (p. 4). In that respect, content is not “delivered” so much as offered, negotiated, and re-negotiated by all the active participants of the learning community. Thus, both peer-to-peer and instructor interaction, from a social constructivist perspective, are key means to support the learning process.

Community of Inquiry

Learning online through interactions with other learners has been broadly described as “a complex process of taking part and maintaining relations with others” (Hrastinski, 2009, p. 80). The community of inquiry (CoI) framework is described in the literature as a social constructivist model of learning processes that emphasizes the importance of learning within social contexts. Garrison et al. (2000) view this perspective as comprising three parts: *teaching presence, social presence and cognitive presence*. The authors emphasize that all of these elements must ideally be present in a learning community and they can interact in mutually beneficial ways. In other words, optimal

online learning is supported through environments where all three elements are incorporated and interrelated (Richardson et. al., 2012).

The CoI model described by Garrison et al. (2000) is a “comprehensive framework that was developed to guide the research and practice of teaching” (Garrison & Arbaugh, 2007, p. 158). The CoI framework is a “dynamic model of the necessary core elements for both the development of community and the pursuit of inquiry, in any educational environment...at [the] core is the unity of a collaborative constructivist learning experience. ...[it provides] perspective and guidance to...purposeful online learning” (Swan et. al, 2009, p. 45).

The three parts of the CoI perspective guide the rationale behind some of the decisions made by educators in an online environment to further student learning and engagement. *Social presence* is “the ability of participants to identify with the community, communicate purposefully in a trusting environment, and develop interpersonal relationships by way of projecting their individual personalities” (Garrison, 2009, p. 352). Dunlap and Lowenthal (2014) explain that social presence indicators represent feelings of belonging within online learning communities and can be affected by situational factors (e.g., course length or topic). *Teaching presence* involves design and organization, facilitating discourse, and direct instruction; it is how the teacher transmits information in a way that is meaningful and productive (Garrison et al., 2001; Shea & Bidjerno, 2008; Swan et al., 2009). *Cognitive presence* is the ability for students to engage in critical learning tasks that support the construction and confirmation of meaning (Garrison et al., 2001).

The Importance of Social Presence in Online Communities. Technology has the potential “to create communities of learners...and can facilitate the interactions and activities necessary” for learning to occur (Jonassen et al., 1995, p. 7). However, research examining student interaction in online learning environments suggest that there can be

a discrepancy between an environment's ability to cultivate student interaction and how well those interactions support learning goals (Kreijns et al., 2003). Kreijns et al. identified two factors contributing to this discord: (1) instructors taking social interaction for granted by relying on the environment to support social interaction, and (2) social interaction in online courses being restricted to cognitive processes that only support educational outcomes. Relying on the environment to support social interaction when social interaction is not intentionally designed and integrated into an online course can potentially perpetuate these issues. Richardson and Swan (2003) suggest that students' learning is negatively affected when instructors do not integrate social interaction and relationship building into their courses. The greater goal of the online learning community, although not always explicit, can be considered to foster social interactions that provide students with opportunities to construct and advance knowledge in a supportive environment. Overcoming the lack of interpersonal interaction experienced in some traditional distance learning (e.g., Jung et al., 2002; Kreijns et al., 2003) involves designing elements of the course to increase social presence from its onset, using the tools of the environment to scaffold this process (Makos, 2017).

The Importance of Teaching Presence in Online Communities. Part of creating a balance between the three presences, and supporting teaching presence, is ensuring the instructor is visible to the students (Redmond et al., 2014). Teaching presence is not only modelling, but also the act of enabling and facilitating more complex learning and instructional activities within multi-functional environments (Gao et al., 2013, p. 469; Gao et al., 2013). Direct instruction, formal and informal is another aspect of teaching presence: "presenting content and questions, focusing the discussion..." (Shea et al., 2006, p. 177). What a teacher does online is not just evident in the main threaded discussion (Shea et. al, 2010) but in the three main areas of teaching presence: design and organization, facilitating discourse, and direct instruction.

The Importance of Cognitive Presence in Online Communities. Cognitive presence is the ability for students to engage in critical learning activities that support the construction and confirmation of meaning (Garrison et al., 2001). These activities, although bringing together elements of teaching and social presence in many ways, lay a critical foundation for collaborative work. Arguably, the absence of cognitive presence is most apparent when online discussion becomes a task-oriented production of individuals posting for its own sake. In these instances, there tends to be little sense of a collective effort to build understanding, as students' attention is focused mainly on completing the task of producing notes, which may have little direct connection to what others have contributed.

Research on PeppeR Communities

PeppeR is a web-based collaborative workspace offering a variety of specialized knowledge-building features and social networking tools designed and improved by the same researchers who are now sharing their expertise. Rather than relying on tools already created and making them fit into their own courses, it has been possible for teachers and researchers to have a working (design) relationship with the environment that allows for ongoing prototyping and testing.

Leading up to this specific project, research using PeppeR has generated promising results in several key online learning areas. A review of this research between the years 2009 to 2020 can be summarized according to the following seven (7) key technological-pedagogical themes:

- Reading behaviours associated with deeper engagement in online discussions: reading notes, scanning, re-reading notes (Wilton & Brett, 2018; Wilton, 2017; Wilton, 2019b).
- Writing behaviours associated with deeper engagement in online discussions: note revising, co-authoring notes, linking notes, use of hashtags, author tagging,

note titles as a form of new literacy (MacKinnon & Hewitt, 2011; MacKinnon & Hewitt, 2014; Makos et al., 2015; Demmens-Epp et al., 2017; Hewitt, 2009; Lee & Brett, 2015; Oztok et al., 2014; Wilton, 2019a).

- Privacy as an element of engagement in online discussions: use of private group spaces, private messages, private notes (Wilton et al., 2020; Alexander et al., 2020; Oztok & Brett, 2011; Hewitt et al., 2013).
- Integration of multi-media (video/audio) and non-verbal/non-text forms of communication in supporting online discussions: use of a “Like” button, emojis, embedded video within notes and online content (Makos, 2017; Alexander & Hewitt, 2020; Malhotra et al., 2019; Makos et al., 2015; Makos & Hewitt, 2014; MacKinnon, 2012).
- Use of data and assessment practices that support deeper engagement in online discussion: measures such as impact reports, notifications, badges, and visualizations of community interactions (Xu & Makos, 2015; Raman et al., 2020; Raman, Hewitt et al., 2020; Wilton, 2019b; Wilton & Brett, 2016; MacKinnon et al., 2014; Brett et al., 2009; Makos & Hewitt, 2013).
- Representations of self and other in online platforms: user profiles, social capital (Brett et al., 2016; Oztok et al., 2012; Wilton & Noel, 2011, Houtman et al., 2014).
- The role of synchronous and asynchronous interactions in supporting online learning: instant messages, who’s online (Oztok et al., 2013; Makos & Kett 2019).¹

¹ For a more complete list of publications associated with the PeppereR project, please see <https://pepperproject.ca/publications/>.

Method

Using the CoI model as a frame to help articulate the best practices that have emerged through our research and practice, we selected three of our expert researcher-practitioners on the PeppeR team to engage in a series of focus group discussions that centered around three key questions:

- How do you design for greater opportunities for social presence in your online courses?
- How do you design for greater opportunities for teacher presence in your online courses?
- How do you design for greater opportunities for cognitive presence in your online courses?

The researcher-practitioners met on several occasions with the specific purpose of discussing these three questions, in order to compare their pedagogical practices and their specific uses of various features of the PeppeR platform in their online courses. Through the process of these ongoing discussions, the instructors co-constructed a list of strategies that represent the key aspects of their teaching that center around the CoI model, and in ways that they have observed to best support intellectual inquiry in their courses.

Selection Criteria

The instructor participants were chosen based on the following criteria:

- They have been involved with the PeppeR project since its inception, or near its inception.
- They have continued to use PeppeR as a core online platform in their teaching.
- They are all engaged in active and continuous inquiry into their own online teaching practices, as both researchers and as instructors.

- They have been recognized as exemplary online instructors among their colleagues both within the PeppeR project and among the broader instructor community.

Combined, the three selected instructors have taught more than 100 online courses over the past ten years using the PeppeR platform, within a graduate-level post-secondary education context.

The Instructors

Instructor 1. Instructor 1 has been a member of the PeppeR Project since its inception in 2010. They were the first instructor to pilot the use of PeppeR in their courses and has continued to use the platform in their teaching over the past ten years. They are also a faculty consultant for OISE’s Teaching and Learning Online team and they have won multiple teaching and research awards for their work in the area of educational technology. Instructor 1 is currently an Online Teaching and Learning Coordinator with their institution, and was also awarded a Faculty Research Grant to explore teachers’ developing awareness and understanding of professional practice in the context of digital learning environments (“e-professionalism” in teaching).

Instructor 2. Instructor 2 has been a member of the PeppeR Project since 2011. Instructor 2 has used PeppeR as a graduate student, teaching assistant, research assistant, and currently as a faculty member. They have been an instructional designer for over eight years in the higher education sector and has designed over 40 online courses. At OISE, Instructor 2 has played a key role in assisting faculty, who have traditionally taught face-to-face, in transitioning their courses into flex or fully online modes. Instructor 2 is also a faculty consultant for OISE’s Teaching and Learning Online team.

Instructor 3. Instructor 3 is a senior researcher for the PeppeR project and has been teaching at OISE since 2012. They currently teach in the Master of Teaching

program, the Department of Curriculum and Pedagogy, and the Department of Leadership, Higher and Adult Education in face-to-face, blended, and fully online formats. Instructor 3 is also a faculty consultant for OISE's Teaching and Learning Online team and has presented at AERA, LRA and CSSE, and published in the *Online Learning Journal*. They are co-editor of a recently published book on online discussion-based teaching methods. Instructor 3 was also recently awarded a Faculty Research Grant.

Summary of Findings

Instructional Design for Social Presence

Ice Breakers or Starter Activities. When joining an online discussion, some students may feel they are taking a risk; they may be unsure that what they are posting is what is expected—even if they have been encouraged to share their ideas freely. Some may be most comfortable learning “silently” (Nordic Council of Ministers, 2017). Research has shown that addressing social presence and building a sense of belonging can encourage those who are less certain about ways to engage (Garrison & Arbaugh, 2007). This activity can take place in its own place or folder and can be the first activity for students before they engage in more in-depth discussions related to readings, video lecturers, or other content. A simple activity that doesn't necessarily involve deep thinking is more likely to be taken up by students early in a discussion cycle. Activities where students share something about themselves or a personal preference can facilitate trust and the building of social presence within the student group (Wilton, 2020b).²

² See “Ice Breakers – Starting the Online Discussion” on the Ontario Institute for Studies in Education (OISE) website at <https://wordpress.oise.utoronto.ca/teachingonline/2020/04/14/ice-breakers-starting-the-online-discussion-2/>.

Instructor Videos. The use of multimedia, particularly video, is a widely used tool in online learning to have instructors and students get to know each other. The use of video by instructors to introduce themselves to the learners in a course has been explored as a way to support both social and teaching presences in online learning (Salazar, 2010). However, it is the position of the researchers that an instructor introductory video best supports the development of social presence. The introductory video is not only one of the initial pieces of information that a student will access in an online course, but one in which the student can better relate and understand the instructor, supporting Short et al.'s (1976) definition of social presence where the choice of media affects the degree of social presence (Makos, 2019, June 29).³

Author Citing/Tagging. In some cases, social software will have functionality such as a mentioning tool to make author citations easier. For example, a reply in a discussion thread might say, "I think @kim's point about the importance of formative assessment as a form of instructional scaffolding is key." The author citation can serve the dual purpose of crediting an author's contribution (reinforcing one's personal status as a contributor within the community), while simultaneously drawing the author's attention to others in the community who may share related interests.

Personal Profiles. Personal profiles can help students and instructors to gain a sense of who is part of their virtual community. For example, PeppeR users can create a profile that includes a photo, their author tag (e.g., @username), their program, and space to include a brief description of their personal and academic interests. A user's profile can be easily accessed from within notes by clicking the author's name or their

³ An example of an instructor video is "Dr. Alexandra Makos Introduction" available on YouTube at <https://youtu.be/VFv3CgN639Y>.

author tag. This may help to contextualize the perspective of a contributor, and develop a sense of the interests and expertise among community members.

Private Notes & Messaging. A private note is a type of situated communication which can augment social presence by facilitating confidential feedback, encouraging authentic participation, or re-directing conversation (Wilton et al., 2020). Further, private messaging allows for a more informal space for instructor-student and student-student communication to occur confidentially outside of the context of a discussion thread. Such private communications can serve to clarify expectations, request office hours, and negotiate groupwork, etc. Private messages also facilitate building trust within a safe space of connection.

Teacher Presence

Setting a Pace for Online Courses. Setting and maintaining pace through the development of a learning cycle for students is important in providing them with time to engage in the course in various ways. When we generate a pattern for the types of tasks that students are to move through each week and map that onto a weekly calendar, they can more readily and successfully meet the instructor's expectations. Developing a logical sequence for students' interactions allows them to read or watch, understand, reflect, and construct ideas about course content. A case study by Makos et al. (2020) suggests that students are able to follow these types of learning cycles through their posting patterns in the online learning environment.

The Instructor is Present Online. There are many ways instructors can be “seen” online. The pace of the course as described above creates opportunities for the instructor to check in and be present in the online learning community in different ways. The instructor can send out announcements to remind students of what they are expected to do that week. While students are engaging in online discussions or

collaborations, the instructor can spend time reading through the student-generated content and supporting areas that may be problematic for students, or giving more general information. When students have down time, instructors can work toward generating feedback for the whole learning community, for groups, or for individuals—including being able to focus on private exchanges with the students. When assessed content is submitted by students, the instructor can shift their focus towards evaluation.

Course Orientation. Setting parameters for interaction (e.g., when students are expected to be online, or when a response can be expected from the instructor) and allowing time for students to familiarize themselves with the course expectations, the functionality of the online environment, and the set up of the course can be critical. One pedagogical practice enacted by the instructors is to include a “Start Here” note and to provide—in its most literal sense—a place to begin.⁴

Setting Communication Expectations. When a core component of an online course is discussion, it’s important to communicate what the expectations are for evidence of deeper engagement over surface-level conversation. This is an excerpt from a blog post by Dr. Makos (2020):

When I think of online discussion posts, I think of them as text-based artefacts that capture elements of our thinking that we would have “said” in a face-to-face interaction. However, since we are not beside each other we need to represent these ideas/thoughts in the medium that our environment permits.

Bringing attention to some of the features of online discussion posts that make it easier to allow for a “discussion” to unfold:

⁴ To see more strategies for supporting course start up, refer to Dr. Leslie Wilton’s (2020) blog post, “Start Here: Where Students Can Begin In Online Learning” on the OISE Online website: <https://wordpress.oise.utoronto.ca/teachingonline/2020/03/22/start-here/>.

Give everyone a little space

In the syllabus, I mention that your notes should be shorter (~100-150 words) and contain one main idea. This isn't a hard and fast rule for word length, but the essence of that is to allow mental space for someone to begin to reply to your post. If you've posted a 500-word note, it becomes more difficult to digest and respond to, ultimately limiting the potential for everyone to unpack and engage with the ideas presented in the note. Sometimes, there will be notes that are longer than others (maybe about 250 words), but remember that as more posts are added, then your ability to read, digest, and respond to what has been posted can become more daunting as a result.

Capturing the Essence

Speaking to how you develop your notes, in my years of learning and teaching in online environments, I've come to recognize the value of the note title. When you are posting, I recommend that you keep one main theme or idea for your note (if you have many things to say, then you write more notes, not a longer one), and create a meaningful title for the note(s) so that we can easily identify the core idea without reading the entire note. A great parallel to draw is thinking about headlines for articles, or subject lines in emails. If there were no headlines or subject lines, recalling or even anticipating what is in the content of these pieces is extremely difficult and doesn't help us situate their role in their context. So, when you are crafting your next post, please create a title that captures the essence of the thinking in your post – what you come up with will surely be more descriptive than something like “week 2 response”.

Using Multiple Modalities for Instruction. It's important to consider which pieces of teaching presence will be synchronous and which will be communicated better through asynchronous delivery. Teaching presence can be supported through the use of synchronous functionality, such as video conferencing and chats. These allow for quicker exchanges between the instructor and students, and for instructor feedback to be more immediate. In the case of a video conference, it also allows for a more “in person” feeling between instructors and their students, and between students and their peers. Asynchronous functionality such as replies to posts, private messages, and email

can allow the instructor to take some additional time to craft their responses, and students can access the information at their own pace, and according to their own work schedule.

Planned Redundancies. Similar to the notion that a ‘teacher needs to say something at least three times to help ensure every student heard it,’ instructors may need ensure that content can be found in multiple ways online to ensure that students are more likely to find it. This thinking process can also help to determine what ought to be covered synchronously and what should be done asynchronously. For example, although key information may be found in places like the course syllabus, or as part of course orientation activities, instructors may also elect to set regular, synchronous meeting times at particular moments in the course. These can allow for impromptu interactions with the instructor and may provide insights on instructor thinking about particular elements or topics in the course.

Integration of Multimedia Artefacts. Instructors can make use of multimedia that can be integrated into discussion threads using links and/or embedded content, as a way for students to access instructor perspectives. Multimedia artefacts, such as audio annotations and video commentary, can be embedded into a slide presentation, which can then be distributed to the class through a shareable link. For example, an instructor could share an image of an important theoretical framework on their slide and insert an audio recording that includes a brief explanation to help students understand its significance in relation to the broader themes of the course. In that sense, the instructor has added a little digitized piece of themselves in order to personalize the content they are sharing within the discussion environment.

Virtual Office Hours/Drop-ins. Holding synchronous group drop-in meetings for students, such as through a video conference, can provide an option for students

who may require additional instructor support for particular aspects of the course. These sessions can include a brief agenda to reinforce concepts or clarify instructions. They may also include time for an open question-and-answer period. These sessions may be particularly important for keeping students who are newer to online learning on track, or for students who feel they may benefit from some “face time” with the instructor rather than conducting all of their learning in an asynchronous format.

Cognitive Presence

Evaluation Spaces. It’s important for instructors to consider the affordances of the online environment for supporting different kinds of assessment. Making use of private replies can be a useful way to provide written feedback to students that is directly tied to the work they are doing within an online course. Additionally, having private student assessment folders can allow for evaluations to be kept in one central place.

Providing Opportunities to Co-construct Knowledge. These activities, often from such platforms as Google Docs or Office 365, can provide spaces for group work to involve back-channeling (background conversations, commenting) and for students to practice engaging in co-construction of knowledge. However, built-in tools in PeppeR also allow for peer-moderated discussion, and co-authored notes.

Linking, Author Citing and Use of Hashtags. Students can be encouraged to make connections between online posts by using author citations (e.g., @username) and by using hashtags (e.g., #concept). In PeppeR, students can also connect back to notes within the community, using a note hyperlinking function. The advantage of using links, citations, and hashtags is that users can respond to ideas within and across threads rather than simply as a direct reply to a post. By leveraging all three of these

tools, it becomes possible to situate one's ideas within a post to other notes, to specific concepts or ideas within the community, and to specific contributors.

Integration of Multimedia Artefacts. By integrating multimedia into instructor content, such as embedded audio and video into presentation slides, these become digital artefacts that can be re-used, re-mixed, and updated to suit the specific and varied needs within each online course. For example, within a slide deck on a particular theme, an instructor could choose which slides to keep, add new slides based on recent updates in the field, and edit recordings in order to personalize the content for a new course section. Instructors can also draw connections between the course content and the discussions happening within each community by updating those particular slides. So, rather than seeing instructor lectures as a static module, it can become an artefact that can easily evolve over time and in response to the discussion happening within each course community.

Encouraging Reading and Revisiting. The pedagogical benefits of active online discussions associated with student's social presence may be overlooked if the instructor focuses only on visible posting activities. Students often read, re-read and reflect on the dialogue, instead of simply posting entries in an online discussion (Wilton, 2019b). Dennen (2008) points out that students who are reading and not posting are comparable to students who listen in class but seldom engage or ask questions. It is important to consider the importance of these activities when assessing student participation. It is also important to consider that students who are not native English speakers may take time to read for meaning. For these reasons, it can be useful to triangulate basic participation data with additional measures related to reading and revisiting notes as forms of "quiet engagement."

Conclusion

In line with the CoI model, this paper helps to shed light on suggested online teaching practices that support social, teaching, and cognitive presence in online platforms from the perspective of instructors who are engaged in both research in and in online learning communities. Within these presences, our experts offer recommendations for effective course design, communication, and evaluation. Several low-cost, high-impact design features have been suggested, including instructor and student biographies, use of multimedia, setting clear expectations for interaction, making use of synchronous and asynchronous communication, strategies for building meaning through connections within threaded discussion (e.g., linking, citing, hashtags), and use of shared and private spaces.

As the PeppereR team looks ahead to the next ten years of design, we concede that these suggestions are not an exhaustive list of practices, but merely represent our efforts to encourage conversations about how to enact elements of social, cognitive, and teaching presence within online communities in which intellectual inquiry and collective meaning-making is an explicit goal. We suggest that it is necessary to intentionally engage in ongoing development of pedagogical and technical strategies in order to further augment and scaffold discussions in ways that ultimately support this objective, and for practitioner-researchers to continue to examine these strategies across varying online learning contexts and platforms.

References

- Avery, T. (2018). Teacher Presence & Pedagogy: A thematic interview discussion about online learning. (Unpublished Master's thesis). University of Toronto.
- Bereiter, C., & Scardamalia, M. (2016). "Good moves" in knowledge-creating dialogue. *Querty-Open and Interdisciplinary Journal of Technology, Culture and Education*, 11(2), 12–26. <http://www.ckbg.org/querty/index.php/querty/article/view/242>
- Brett, C., Forrester, B., & Fujita, N. (2009). Learning journals as an instructional and self-assessment tool for epistemological growth in online learning. *Canadian Journal of Learning and Technology*, 35(1), 1–18. <https://eric.ed.gov/?id=EJ880052>
- Brett, C., Lee, K., & Oztok, M. (2016, May 9). Socialization and social capital in online doctoral programs. Proceedings of the 10th International Conference on Networked Learning, Lancaster University, 264–268. <http://hdl.handle.net/1807/74902>
- Caskurlu, S. (2018, October). Confirming the subdimensions of teaching, social, and cognitive presences: A construct validity study. *The Internet and Higher Education*, 39, 1–12. <https://doi.org/10.1016/j.iheduc.2018.05.002>
- Castellanos-Reyes, D. (2020). 20 years of the community of inquiry framework. *Tech Trends*, 64, 557–560. <https://doi.org/10.1007/s11528-020-00491-7>
- Darabi, A., Arrastia, M. C., Nelson, D. W., Cornille, T., & Liang, X. (2011, June). Cognitive presence in asynchronous online learning: A comparison of four discussion strategies. *Journal of Computer Assisted Learning*, 27(3), 216–227. <https://doi.org/10.1111/j.1365-2729.2010.00392.x>
- Dede, C. (1996). The evolution of distance education: Emerging technologies and distributed learning. *American Journal of Distance Education*, 10(2), 4–36. <https://doi.org/10.1080/08923649609526919>
- Demmans Epp, C.; Phirangee, K. & Hewitt, J. (2017). Student actions and community in online courses: The roles played by course length and facilitation method. *Online Learning*, 21(4), 53–77. <https://files.eric.ed.gov/fulltext/EJ1163530.pdf>
- Dempsey, P. R., & Zhang, J. (2019). Re-examining the construct validity and causal relationships of teaching, cognitive, and social presence in Community of Inquiry framework. *Online Learning Journal*, 23(1), 62–79. <https://olj.onlinelearningconsortium.org/index.php/olj/article/view/1419>

- Dennen, V. P. (2008, July). Pedagogical lurking: Student engagement in non-posting discussion behavior. *Computers in Human Behavior*, 24(4), 1624–1633.
<https://doi.org/10.1016/j.chb.2007.06.003>
- Dewey, J. (1910, 1938). *Experience and education*. Collier Books.
- Dewey, J. (1998). How we think: A restatement of the relation of reflective thinking to the educative process. Houghton Mifflin.
- Dunlap, J., & Lowenthal, P. (2018). Online educators' recommendations for teaching online: Crowdsourcing in action. *Open Praxis*, 10(1), 79–89.
<https://doi.org/10.5944/openpraxis.10.1.721>
- Fussell, S. R. (2002). The verbal communication of emotion: Introduction and overview. In S. R. Fussell (Ed.), *The verbal communication of emotions: Interdisciplinary perspectives* (1–15). L. Erlbaum Associates.
- Gao, F., Zhang T., & Franklin, T. (2013, May). Designing asynchronous online discussion environments: Recent progress and possible future directions. *British Journal of Educational Technology*, 44(3), 469–483. <https://doi.org/10.1111/j.1467-8535.2012.01330.x>
- Garrison, D. R. (2009). Communities of inquiry in online learning. In Rogers, P. L., Berg, G. A., Boettcher, J. V., Howard, C., Justice, L., & Schenk, K. D. (Eds.), *Encyclopedia of distance learning, Second Edition* (p. 352–355). IGI Global. <https://doi.org/10.4018/978-1-60566-198-8.ch052>
- Garrison, D. R. & Arbaugh, J. B. (2007). Researching the community of inquiry framework: review, issues, and future directions. *The Internet and Higher Education*, 10(3), 157–172.
<https://doi.org/10.1016/j.iheduc.2007.04.001>
- Garrison, D. R., Anderson, T., & Archer, W. (2000, September). Critical inquiry in a text-based environment: Computer conferencing in higher education model. *The Internet and Higher Education*, 2(2-3), 87–105. [https://doi.org/10.1016/S1096-7516\(00\)00016-6](https://doi.org/10.1016/S1096-7516(00)00016-6)
- Garrison, D. R., Anderson, T., & Archer, W. (2001, September 24). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, 15(1), 7–23. <https://doi.org/10.1080/08923640109527071>
- Garrison, R. (2018, September 29). Validity of CoI. [Editorial] *The Community of Inquiry Editorials*. Athabasca University. <http://www.thecommunityofinquiry.org/editorial15>
- Hewitt, J. (2009, November 17). Toward an understanding of how threads die in asynchronous computer conferences, *Journal of the Learning Sciences*, 14(4), 567–589.
https://doi.org/10.1207/s15327809jls1404_4

- Hewitt, J, Brett, C. & MacKinnon, K. (2013, June). A study of private messaging within an asynchronous discussion environment. In Rummel, N., Kapur, M., Nathan, M., & Puntambekar, S. (Eds.), *To See the World and a Grain of Sand: Learning across Levels of Space, Time, and Scale: CSCL 2013 Conference Proceedings Volume 2 – Short Papers, Panels, Posters, Demos & Community Events* (pp. 46-49). International Society of the Learning Sciences. <https://repository.isls.org/handle/1/1948>
- Houtman, E., Makos, A., & Meacock, H.L. (2014, January). The intersection of social presence and impression management in online learning environments. *Journal of E-Learning and Digital Media*, 11(4), 419-430. <https://doi.org/10.2304/elea.2014.11.4.419>
- Hrastinski, S. (2009, January). A theory of online learning as online participation. *Computers & Education*, 52(1), 78–82. <https://doi.org/10.1016/j.compedu.2008.06.009>
- Jonassen, D. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development*, 39(3), 5–14. <https://doi.org/10.1007/BF02296434>
- Jonassen, D., Davidson, M., Collins, M., Campbell, J., & Haag, B. B. (2009, September 24). Constructivism and computer-mediated communication in distance education. *American Journal of Distance Education*, 9(2), 7–26. <https://doi.org/10.1080/08923649509526885>
- Jung, I., Choi, S., Lim, C., & Leem, J. (2002). Effects of different types of interaction on learning achievement, satisfaction and participation in web-based instruction. *Innovations in Education and Teaching International*, 39(2), 153–162. <https://doi.org/10.1080/14703290252934603>
- Kang, M & Im, T. (2013, June). Factors of learner–instructor interaction which predict perceived learning outcomes in online learning environment. *Journal of Computer Assisted Learning*, 29, 292–301. <https://doi.org/10.1111/jcal.12005>
- Kreijns, K., Kirschner, P. & Jochems, W. (2003, May) Identifying the pitfalls for social interaction in computer-supported collaborative learning environments: A review of the research. *Computers in Human Behavior*, 19(3), 335–353. [https://doi.org/10.1016/S0747-5632\(02\)00057-2](https://doi.org/10.1016/S0747-5632(02)00057-2)
- Kumi-Yeboah, A., Yuan, G., & Dogbey, J. (2017). Online collaborative learning activities: The perceptions of culturally diverse graduate students. *Online Learning*, 21(4), 5–28. <https://eric.ed.gov/?id=EJ1163472>
- Lee, K., & Brett, C. (2015). Dialogic understanding of teachers’ online transformative learning: A qualitative case study of teacher discussions in a graduate-level online course. *Teaching and Teacher Education*, 46, 72–83. <https://doi.org/10.1016/j.tate.2014.11.001>

- Lee, L. (2016, June). Autonomous learning through task-based instruction in fully online language courses. *Language, Learning and Technology*, 20(2), 81–97.
<https://www.lltjournal.org/item/2948>
- MacKinnon, K. & Hewitt, J. (2014, April 3–7). Examining student note revising as a component of knowledge construction in discussion-centered online courses [Poster presentation]. American Educational Researchers' Association (AERA) Annual Meeting, Philadelphia, PA.
- MacKinnon, K. & Hewitt, J. (2011, May 28–June 1). Encouraging idea consolidation among graduate students in online courses [Paper presentation]. Canadian Society for Studies in Education (CSSE) Annual Meeting, University of New Brunswick.
- MacKinnon, K., Makos, A., Wilton, L., Hewitt, J., Brett, C., Dahtoo, M., & Birch, H. (2014, May 24–28). Understanding the meaning and value of online metrics: How assessment analytics can be used to support and evaluate collaboration and community in online courses [Panel presentation]. Canadian Society for the Study of Education Annual Conference, St. Catherine's, ON.
- MacKinnon, K. (2012, September). Context matters: The value of analyzing human factors within educational contexts as a way of informing technology-related decisions within design research. *International Journal of Computer-Supported Collaborative Learning*, 7(3), 379–397. <http://dx.doi.org/10.1007/s11412-012-9149-9>
- Makos, A. (2020, May 23). How to create online discussion posts [Blog post].
<https://teachingonline.oise.utoronto.ca/how-to-create-online-discussion-posts/>
- Makos, A. [Alexandra Makos] (2019, June 29). *Dr. Alexandra Makos Introduction* [Video]. YouTube. <https://youtu.be/VFv3CgN639Y>
- Makos, A. (2017, June). *The Like button: A Way to explore social interaction in threaded discourse* [Doctoral Thesis, University of Toronto]. TSpace Repository.
<http://hdl.handle.net/1807/79349>
- Makos, A., & Birch, H. (2014). "My Impact" tool: Increasing student productivity in online discussions by providing private access to their participation data [Conference session]. 25th Annual Edward F. Kelly Evaluation Conference, Toronto, ON, November 7th, 2014.
- Makos, A., & Hewitt, J. (2013, March 21–22). Enhancing academic behaviour and personalizing student learning through the integration of an intelligent recommendation system in an online learning environment [Paper presentation]. Annual Dean's Graduate Student Research Conference, Ontario Institute for Studies in Education, University of Toronto.

- Makos, A., & Hewitt, J. (2014, September 27–28). *The Like button: What a head-nod looks like in online collaborative discussions* [Paper presentation]. Social Media and Society International Conference, Toronto, ON.
- Makos, A., & Kett, S. (2019, October 9). *Optimal Learning in ANY Context*. Online Learning 2019: Special Address. Toronto, ON.
- Makos, A., & Xu, Z. (2015, April 16–20). *The Impact of a notification system on student behaviours in a collaborative online learning environment* [Paper presentation]. American Education Research Association Annual Conference, Chicago, IL.
- Makos, A., Lee, K., & Zingaro, D. (2015, October 15). Examining the characteristics of student postings that are liked and linked in a CSCL environment. *British Journal of Educational Technology* 46, 1281–1294. <https://doi.org/10.1111/bjet.12201>
- Makos, A., Avery, A., Sargoruh, W., Raman, P., Brett, C., Hewitt, J. (2020). This is why we do it: Using a design-based approach to optimize student learning in an online discussion-based Course. *Special Issue on Teacher Education in the International Journal of E-Learning and Distance Education*. <http://www.ijede.ca/index.php/jde>
- Malhotra, T., Mann, A., Avery, T., & Brett, C. (2019, July 1–3). Exploring the relationship between instructor created online video characteristics and pedagogy. In *EDULEARN19 Proceedings 11th International Conference on Education and New Learning Technologies*, Palma, Spain (pp. 3190–3198). IATED Academy.
- Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education*, 3(2): 1–6. <https://doi.org/10.1080/08923648909526659>
- Nandi, D., Hamilton, M., & Harland, J. (2012). Evaluating the quality of interaction in asynchronous discussion forums in fully online courses. *Distance Education*, 33(1), 5–30. <https://doi.org/10.1080/01587919.2012.667957>
- Nordplus. (2017). Nordic Council of Ministers. Silent learners—A guide. Nordic Network for Adult Learning (NVL). <https://nvl.org/Content/Silent-learners-a-guide>
- Oztok, M. (2016). Cultural ways of constructing knowledge: The role of identities in online group discussions. *International Journal of Computer-Supported Collaborative Learning*, 11(2), 157–186. <https://doi.org/10.1007/s11412-016-9233-7>
- Oztok, M., & Brett, C. (2011, May). *Investigating the Value of Instant Messaging within Asynchronous Learning Environments* [Paper presentation]. Annual Meeting of the Canadian Society for the Study of Education, Fredericton, NB.
- Oztok, M., Lee, K., & Brett, C. (2012). Towards Better Understanding of Self-Representation in Online Learning. In T. Bastiaens & G. Marks (Eds.), *Proceedings of E-Learn 2012* (p. 256–

- 262). Presented at the World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education, Montréal, QC. <http://hdl.handle.net/1807/73517>
- Oztok, M., Wilton, L., Lee, K., Zingaro, D., MacKinnon, K., Makos, A., Phirangee, K., Brett, C., & Hewitt, J. (2014, January). Polysynchronous: dialogic construction of time in online learning. *E-Learning and Digital Media*, 11(2), 154–161. <http://dx.doi.org/10.2304/elea.2014.11.2.154>
- Oztok, M., Zingaro, D., Brett, C., & Hewitt, J. (2013, January). Exploring Asynchronous and Synchronous Tool Use in Online Courses. *Computers & Education*, 60(1), 87–94. <https://doi.org/10.1016/j.compedu.2012.08.007>
- Oztok, M., Zingaro, D., Makos, A., Hewitt, J., & Brett, C. (2014, April). *Towards Understanding Threads as Social and Cognitive Artifacts for Knowledge Building in Online Learning* [Paper presentation]. Annual Meeting of the American Educational Research Association. Philadelphia, Pennsylvania. <https://tspace.library.utoronto.ca/handle/1807/87665>
- Raman, P., Avery, T., Brett, C. & Hewitt, J. (2020, June 1). *#try Hashtagging for knowledge sharing in online discussions* [Accepted paper]. Canadian Society for Studies in Education Annual Conference, Western University, London, ON.
- Raman, P., Hewitt, J., Alexander, P., & Wilton., L. (2020). *Affective gamification: Understanding student behaviours and tones in online discussions using award badges* [Conference session]. AERA Annual Meeting [cancelled], San Francisco, USA. <https://www.aera.net/>
- Redmond, P., Devine, J., & Basson, M. (2014, May 13). Exploring discipline differentiation in online discussion participation. *Australasian Journal of Educational Technology*, 30(2), 122–135. <https://doi.org/10.14742/ajet.624>
- Richardson, M., Bond, R., & Abraham, C. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, 138, 353–387. <https://doi.org/10.1037/a0026838>
- Rodriguez, M. (2014, December 2). Content analysis as a method to assess online discussions for learning. *SAGE Open*. <https://doi.org/10.1177/2158244014559019>
- Rourke, L., & Kanuka, H. (2009). Learning in communities of inquiry: A review of the literature. *Journal of Distance Education*, 23(1), 19–48. <http://www.ijede.ca/index.php/jde/article/view/474>
- Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education*, 1(12), 8–22. <https://telearn.archives-ouvertes.fr/hal-00197319/>

- Salazar, J. (2010). Staying connected: Online education engagement and retention using educational technology tools. *Clinical Laboratory Science*, 23(3 Suppl), 3–58. <https://pubmed.ncbi.nlm.nih.gov/20803836/>
- Scardamalia, M., & Bereiter, C. (2003). Knowledge building. In *Encyclopedia of Education*. (2nd ed., p. 1370–1373). Macmillan Reference, USA. https://ikit.org/fulltext/2003_knowledge_building.pdf
- Shea, P., & Bidjerano, T. (2009, April). Community of inquiry as a theoretical framework to foster “epistemic engagement” and “cognitive presence” in online education. *Computers and Education*, 52, 543–553. <https://doi.org/10.1016/j.compedu.2008.10.007>
- Shea, P., Hayes, S., & Vickers, J. (2010, October). Online instructional effort measured through the lens of teaching presence in the community of inquiry framework: A re-examination of measures and approach. *The International Review of Research in Open and Distributed Learning*, 11(3), 127–154. <https://files.eric.ed.gov/fulltext/EJ913864.pdf>
- Shea, P., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *The Internet and Higher Education*, 9(3), 175–190. <https://doi.org/10.1016/j.iheduc.2006.06.005>
- Short, J., Williams, E. & Christie, B. (1976) *The social psychology of telecommunications*. John Wiley & Sons.
- Swan, K., Garrison, D. R. & Richardson, J. C. (2009). A constructivist approach to online learning: The Community of Inquiry framework. In Payne, C. R. (Ed.) *Information Technology and Constructivism in Higher Education: Progressive Learning Frameworks*, 43–57. IGI Global. <http://doi:10.4018/978-1-60566-654-9.ch004>
- Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education. *International Journal of Educational Telecommunications*, 6(4), 339–362. <https://vrasidas.com/wp-content/uploads/2007/07/continuum.pdf>
- Vrasidas, C., & Glass, G., (2007, December). Teacher Professional Development and ICT: Strategies and Models. *Yearbook of the National Society for the Study of Education*, 106(2), 87–102. <https://doi.org/10.1111/j.1744-7984.2007.00116.x>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Walther, J. B., Loh, T., & Granka, L. (2005, March). Let me count the ways: The interchange of verbal and nonverbal cues in computer-mediated and face-to-face affinity. *Journal of Language and Social Psychology*, 24(1), 36–65. <https://doi.org/10.1177/0261927X04273036>

- Wilton, L. (2017). *The Three Rs of Online Learning: Interpretive Views of the Social Practices of Reading, Rereading and Revisiting*. [Doctoral Dissertation]. University of Toronto.
- Wilton, L. (2019a, Nov. 29-Dec.2). *Towards an Understanding of New Literacies and Social Practices in Online Learning* [Paper presentation]. Literacy Research Association's (LRA) 69th Annual Conference, Tampa, FL.
- Wilton, L. (2019b). Quiet Participation: Investigating non-posting activities in online learning. *Online Learning Journal*, 22(4), 65–88.
<https://olj.onlinelearningconsortium.org/index.php/olj/article/view/1518>
- Wilton, L. (2020a, March 23). Start Here [Blog post].
<https://wordpress.oise.utoronto.ca/teachingonline/2020/03/22/start-here/>
- Wilton, L. (2020b, April 14). Ice breakers – Starting the online discussion [Blog post].
<https://wordpress.oise.utoronto.ca/teachingonline/2020/04/14/ice-breakers-starting-the-online-discussion-2/>
- Wilton, L. & Brett, C. (2015, December 2). *Literacy practices in online learning discussions* [Paper presentation]. Literacy Research Association 65th Annual Conference, Carlsbad, CA
- Wilton, L. & Brett, C. (2016, April). *Investigating Learner Perceptions and Entry Properties of Non-Posting Activity in Collaborative Online Courses* [Paper presentation]. American Educational Research Association (AERA) Conference, Washington, DC.
- Wilton, L., & Brett, C. (2018, October 17) Why Reading and Rereading Matter in online learning discussions [panel discussion]. *The Conversation is Online: Characteristics of successful online graduate courses and the pedagogy that support the conversation*. Online Learning 2018, Toronto, Ontario. <http://bit.ly/2AzHuI4>
- Wilton, L., Khan, R., Brett, C., & Alexander, P. (2020). Private interactions in online learning discussions: Instructor perspectives. In Wilton, L. & Brett, C. (Eds.), *Handbook of Research on Online Discussion-Based Teaching Methods*, (p. 351–379). IGI Global. <https://www.igi-global.com/chapter/private-interactions-in-online-discussions/254780>
- Wilton, L., & Noël, T. (2011). Avatars: Usefulness in collaborative online learning environments. *Collected Essays on Learning and Teaching, IV*. <https://eric.ed.gov/?id=EJ1058785>
- Woo, Y., & Reeves, T. C. (2007). Meaningful interaction in web-based learning: A social constructivist interpretation. *The Internet and Higher Education*, 10(1), 15–25.
<https://doi.org/10.1016/j.iheduc.2006.10.005>
- Xu, Z., & Makos, A. (2015, March). Investigating the impact of a notification system on student behaviours in a discourse-intensive online course [Paper presentation]. Learning Analytics Conference, Poughkeepsie, NY.

Young, M. (2014). Curriculum theory: what it is and why it is important. *Cadernos de Pesquisa*, 44(151), 190–202. <https://dx.doi.org/10.1590/198053142851>

Authors

Dr. Kim MacKinnon is an Assistant Professor, Teaching Stream, OISE. She is also Editor of *The MT Review*, a journal publication housed within the Master of Teaching program. Her research is in the areas of online teaching and learning, supporting online communities, and teacher development and professionalism in digital learning kimberley.mackinnon@utoronto.ca.

Dr. Alexandra Makos is a faculty member at OISE/UT. Her current research explores the role of how social presence is represented and enacted in online learning environments. The research is aimed to better understand how social affordances in learning environments are purposefully mobilized through instructional design. Email: alexandra.makos@utoronto.ca.

Dr. Lesley Wilton is a faculty member at OISE/UT. She is a consultant for OISE's Teaching and Learning Online team. Her research has been presented at AERA, LRA and CSSE, and published in the *Online Learning Journal*. She co-edited the *Handbook of Research on Online Discussion-Based Teaching Methods* (2020). Email: lesley.wilton@utoronto.ca.

Dr. Clare Brett is currently the Chair for Graduate Studies in the Department, and Associate Professor in the area of Education and Knowledge Technologies. She is also an Associate Member of Technology Enhanced Learning (TEL) centre at the University of Lancaster. Her research and teaching focus lies in the area of education and knowledge technologies. Email: clare.brett@utoronto.ca.

Taru Malhotra is a Ph.D. Candidate at the Faculty of Education at York University. Her research focuses on educators' beliefs, adoption of technologies, pedagogy, and their practices in online and blended environments. She has taught pre-service teachers and has been involved in projects around iPad integration and studio-based blended courses. Email: taru_malhotra@edu.yorku.ca.

Teresa Avery is a PhD student in the Doctor of Philosophy, CSTD program at OISE. She is also pursuing the collaborative program with the Information School in Knowledge Media and Design. Teresa is interested in aspects of online discussion and collaboration which can incite critical thinking in online learning. Email:

teresa.avery@mail.utoronto.ca

Preeti Raman is a PhD student in the Curriculum Studies and Teacher Development program at the Ontario Institute for Studies in Education. She has an M.S. in Computer Science, an M.A in Curriculum and Pedagogy and teaches Data Science courses. She researches online learning communities, ethical AI and human-centered learning analytics. Email: preeti.raman@mail.utoronto.ca