

Discussion in graduate online bioethics programs

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Abstract In this paper, we explore best practices for asynchronous discussions in graduate online bioethics education. We explain that online approaches have advantages and challenges in contrast to in-person discussions. Online challenges are lack of visual or auditory cues and technical access. Advantages include extended opportunities for specific focus, thoughtful reflection, and critical review. We found no significant review of related best practices in bioethics. Our more general literature review of graduate education and online approaches, plus experience in our own bioethics graduate program, suggest provisional best practices that we detail. We reason that online graduate discussion provisionally should aim for a “community of inquiry” framework that incorporates cognitive, social, and teaching “presences,” as well as a learning presence. However, we also note unresolved concerns about whether the framework sufficiently addresses learning, is complete, and captures communicative functions. Drawing further on the literature, we also suggest best practices for instructor feedback to students about their discussion performance, including that remarks should be timely and specific. Summaries from

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two courses in our graduate bioethics program illustrate how we implement discussion strategies. Finally, we review assessment strategies and suggest that embedded formative assessments in discussion (i.e., instructor feedback, rubrics, etc.) support and demonstrate deeper learning. Limitations in generalizability include that our review targets asynchronous and text-based online discussion, our program assessments do not necessarily detail best practices, student expectations and approaches could be rather particular to our program, and specific bioethics content in principle could alter best practices.

Keywords Bioethics · Discussion · Education · Graduate · Online · Review

Introduction and background

A core learning strategy for graduate online education is group discussion. Discussion aims to advance critical thinking and analysis skills through collective inquiry into specific content. “The discussion forum is an essential part of online courses. It’s where students interact, reflect, exchange ideas, and expand their knowledge base. The quality of the discussion forum depends on the ability to develop a sense of community, the clarity of the discussion questions, and the use of a grading rubric that includes standards of performance” (Craig 2013, p. 5). Bioethics online courses are no exception. Here we consider what online practices best foster these aims in bioethics. The analysis explores advantages and challenges of online methodology, comparing and contrasting it with traditional in-person strategies. The account builds on literature about best practices in graduate education, both in-person and online. We also consider studies and reviews about undergraduate discussions in both modalities. We found no significant literature addressing best practices in online bioethics graduate education. This paper aims to start filling that gap.

Online graduate education can be synchronous, asynchronous, text-based, audio alone, text and audio, audio-visual, text plus audio-visual, and combinations. A comprehensive assessment of these online options is beyond the present scope. As our extensive experience is predominantly asynchronous, text-based graduate bioethics education, this paper primarily considers best practices for this single online modality. However, our conclusions are provisional because best practices for graduate education generally are often not established and virtually absent for bioethics.

Small group discussion is widely employed in graduate education and was central in the graduate education experiences of the authors in philosophy, anthropology, nursing, and education. What should discussion generally aim to accomplish? Garrison and Cleveland-Innes (2005) found that:

Some have argued that in higher education, it is valuable and even necessary to create a community of inquiry where interaction and reflection are sustained; where ideas can be explored and critiqued; and where the process of critical inquiry can be scaffolded and modeled. Interaction in such an environment goes beyond social interaction and the simple exchange of information (p. 133).

The notion of collective work to advance students’ learning is both intuitively appealing and progressively employed. Akyol et al. (2009b) a few years later note “growing emphasis on building learning communities in order to increase student

participation and to foster learning in online and blended learning environments” (p. 66). (“Blended” combines online and in-person.)

Garrison and Cleveland-Innes (2005) may be correct that a “community of inquiry” (CoI) model may be crucial for best student learning, including online. As we explain later, CoI is actually an elaborate model that has generated a major literature of applications, analyses, and critiques. For example, see Akyol and Garrison 2008; Akyol et al. 2009a, b; Annand 2011, Darabi and Jin 2013, deNoyelles et al. 2014, Hamann et al. 2012; Hosler and Arend 2012; Kozan and Richardson 2014; Rourke and Kanuka 2009; Rubin et al. 2013; Shea et al. 2010, 2012; Xin 2012. In light of these accounts, we will explain why CoI should *provisionally* be a framework for graduate bioethics discussion, but with amendments.

This paper culls key features of CoI and other topics from the literature. A comprehensive summary of published accounts is beyond the present scope. After addressing methods, we first compare and contrast face-to-face and asynchronous online discussions. Then we consider best practices for asynchronous graduate online discussion and instructor feedback. Next we provide two detailed examples from our Master of Science Program in Health Care Ethics, drawing connections with prior material in the paper. We then consider best guidelines for students’ initial and responding comments in online discussions. We provide a summary review of how we assess student learning with examples from our program. The final section addresses limitations prior to the conclusion.

Methods

To assess best practices for discussions we reviewed the English language literature using electronic databases, including Academic Search Premier (EBSCO), ERIC, and Google Scholar. We employed key words such as discussion, seminar, forum, and group singly and in combination with terms like online, graduate, and undergraduate. A second search for literature about the CoI framework, especially building on work by Garrison and colleagues, yielded 98 potentially relevant articles. Those articles were then scanned for relevance. From articles identified in the first searches and from the 98, we identified other literature in article references, sometimes called “snowballing” (Sayers 2007). We also culled our graduate program assessment outcomes. To promote more objective responses and ensure fair grading, our graduate student course and program evaluations are anonymous. We also considered our experiences as graduate students and graduate faculty. The assessment section elaborates our program assessment methods specific to discussions.

Results and discussion by topic

We summarize and discuss the results of our inquiry for each topic, sorting them by category in the following sections.

In-person synchronous versus online asynchronous graduate discussions: general features

Results Physical proximity or its lack obviously distinguishes online from in-person discussions. What follows from this difference? The traditional benchmark for graduate

discussion is in-person groups, what our own graduate school experiences comprised. “One comment often heard from online instructors and students is the loss of human touch in a fully online course” (deNoyelles et al. 2014, p. 155). Summarizing attributes of such “face-to-face” discourse, Garrison et al. (2000) wrote:

Traditionally, educational interactions have been based upon oral communications between and among teachers and learners. Oral communication tends to be fast-paced, spontaneous, fleeting, and less structured than text-based communication. Notwithstanding what might be considered less-than-ideal characteristics for discipline and rigorous thinking, experience has shown that oral critical discourse can facilitate critical thinking—at least in well-moderated small seminar groups. Moreover, oral communication in a face-to-face context provides *multiple non-verbal or paralinguistic cues* such as facial expression and tone of voice. Socially and emotionally, face-to-face oral communication is a rich medium (p. 90, emphasis added).

These summary points fit our experience and as, Wang and Woo (2007) note, visual cues help instructors “read” meaning. Further, in contrast to in-person discussion they found that online approaches also included technical access problems, longer discussion duration and preparation time, text emphasis without voice cues, increased focus on specific topics and tasks, and more complex language.

Asynchronous online discussion involves “computer-supported collaborative learning” without immediate instructor oversight (Stahl et al. 2006, p. 409). Instructors are not monitoring student inputs and exchanges 24/7. The general idea is that “students learn by expressing their questions, pursuing lines of inquiry together, teaching each other, and seeing how others are learning” (Stahl et al. 2006, p. 410). Asynchronous online exchange has greater potential than simultaneous in-person discussion to promote collaborative sharing: “In online discussions participants may feel more comfortable, and within these discussions there are more equal opportunities for participants to make contributions” (Joubert and Wishart 2012, p. 111). We will address the merits of collaboration in the next section. However, “stimulating and sustaining productive student interaction is difficult to achieve; it requires skillful planning, coordination, and implementation of curriculum, pedagogy, and technology” (Stahl et al. 2006, p. 410). For example, online instructors must provide prior and clear guidance about what to address and how, word limits (usually), and deadlines for both initial contributions and responses to peers. Online instructors and students also require technical facility with the computer interface.

Wang and Woo (2007) also found a greater tendency to be reflective and critical online. Hamann et al. (2012) concluded from the literature and their study of 53 upper-level undergraduate students in political theory, that in comparison to in-person discussion, online discourse promoted higher levels of critical thinking and reflection. Our experience as instructors with online asynchronous graduate discussion also is that students’ repeated and mutual engagement about a topic produces much deeper and significant critical commentary than occurred in our in-person graduate seminars. Confirming our teaching observations and investigations of Wang and Woo (2007) and Hamann et al. (2012), Putman et al. (2012) reviewed literature supporting that more reflection and higher levels of critical thinking flow from online than from face-to-face

approaches. As they summarize, “critically engaging with and reflecting on content prior to sharing was theorized to account for differences” (p. 153). One caveat was that measurement mainly addressed group progress rather than individuals and that adequate “coding schemes” for the latter were not available (Putman et al. 2012, p. 153).

deNoyelles et al. (2014) assessed online “strategies...that positively enhanced the community at large by impacting social, cognitive, and teaching presences” (p. 159). One such strategy involves “protocols” “by establishing a well-defined goal, clear roles, set rules for interactions, and specific deadlines ... to enhance problem solving, encourage different perspectives, and build shared knowledge” (deNoyelles et al. 2014, p. 160). We did not encounter a study comparing the frequency of protocols in online versus face-to-face discussions.

Discussion Differences and similarities exist between asynchronous online and in-person discussions. Immediate responses to non-verbal cues in the former are impossible. Although in-person discussion instructors can promptly re-channel skewed inquiry, online teachers generally will do so at some later time, ideally before the discussion ends or students move on to another topic. Face-to-face instructors can quickly constrain those who would dominate, act disrespectfully, or otherwise undermine collaborative inquiry. Online instructors can constructively respond and/or permanently delete such remarks, but such comments remain until removed. Both online and in-person instructors can be thickly involved and redirect discussion “threads” or topics as helpful.

In-person leaders ostensibly can more effectively encourage shy students’ engagement. But the online medium could be less challenging for the timid and online submission requirements (deadlines, word specifications, etc.) should strongly motivate overcoming shyness. Needed facility with technical interfaces generally will be much greater for online approaches. Although instructors in either medium may need to develop computer-based documents and presentations, courses online also run through complex learning management systems that require facility.

During in-person seminars, instructors can readily establish tone, inspire participation, model intellectual inquiry, and demonstrate respectful interchange. But asynchronous online instructors can do likewise through texts, audio, and visual means. Also, during face-to-face models, typical needs for rapid responses, movement to other issues, and time limitations obviously can impede thoughtful reflection, careful reasoning, and evidence development.

We noted evidence that online discussion promotes higher levels of critical thinking and reflection than does the in-person approach, matching our prior graduate student experiences and our own experiences as instructors in our online graduate courses. However, such apparent differences must be interpreted with caution. Many factors may confound such interpretation, including sample size, age, level, experience of students, technical interface issues, subject or discipline, and specific course design.

We noted several challenges facing online instructors in course design, guidance, and technology (Stahl et al. 2006). However, promoting productive student interaction during face-to-face discussion apparently shares many needed features with online approaches. Examples would be carefully constructed discussion questions, guidelines for and modeling of mutually respectful exchange, analysis objectives, and so forth.

Suggested best practices for asynchronous graduate online discussion

Ideally and regardless of medium, controlled or comparative studies comparing pedagogical approaches should be used to identify best educational practices. Generally what we found about possible online best practices is reasonably considered provisional or preliminary because relevant studies were often not located.

Results Recommended pedagogy for online discussions follows what would intuitively be best practices for in-person seminars and courses. For example, assignments and source materials should meet course objectives (Craig 2013); expectations should be clear and specific (Getzlaf et al. 2009); and exercises, guidelines, and instructor comments should promote higher levels of thinking within a community of learning (Craig 2013; Putman et al. 2012). Of course, a critical question is just what promotes higher levels of thinking?

Darabi and Jin (2013) studied online discussion strategies, assessing work of 50 upper level undergraduates. They found that example posts and a limited number of posts per page increased cognitive learning. Thus a sample post and visual limitations were helpful. Their work was based in “cognitive load theory” that posits large amounts of material reduce learning (Darabi and Jin 2013, p. 21).

Stahl et al. (2006) write that the ultimate aim for online discussion is collaborative learning where “collaboration is primarily conceptualized as a process of shared meaning construction. The meaning-making is not assumed to be an expression of mental representations of the individual participants, but is an interactional achievement” (p. 415). The general idea is cognitive advancement through mutually contributory effort. “Collaboration” is distinguished from “cooperation,” the latter comprised of non-overlapping efforts toward a common goal (Stahl et al. 2006). Obviously students could submit papers and comments online that follow an assignment. Then instructors can give them individual feedback. But in online discussion, mutuality or give-and-take exists by definition. However, what are the best models for such collaboration and what are the goals?

As we alluded to above, for online education the most prominent framework for collaboration is the “community of inquiry” or CoI concept. Garrison et al. (2000) concluded that the literature supported three key elements of an inquiry model (described below). Putman et al. (2012) later found that the relevant literature probably referenced this framework more than others. Putman et al. write: “The model suggests that as learners engage in online dialog, existing perceptions are examined and new ones are considered within the ongoing information exchange” (p. 152). The model envisions three overlapping “presences” in the online environment. We judge that these parameters could be descriptive, normative, and/or evaluative.

- “*Cognitive presence*” is participants’ ability “to construct meaning through sustained communication” (Garrison et al. 2000, p. 89). This characterization fits the above claim of Stahl et al. (2006) regarding collaborative learning. Correspondingly, Garrison et al. (2000) wrote that: “Collaboration is seen as an essential aspect of cognitive development since cognition cannot be separated from the social context” (p. 92). The authors also highlight the interaction of “personal meaning

- and shared understanding” (Garrison et al. 2000 p. 98). In their conception, cognitive presence has several features consistent with models of critical thinking.
- “*Social presence*” occurs when “participants...project themselves socially and emotionally” as genuine persons (Garrison et al. 2000, p. 94). The authors reason that social presence helps sustain cognitive presence and foster collaboration. Mutual “socio-emotional support” fosters critical thinking and “self-disclosure” promotes reciprocal exchange and trust (Garrison et al. 2000, p. 100). Openness, another feature, incorporates respectful interaction that includes “recognition of each other’s contributions” (Garrison et al. 2000, p. 100).
 - “*Teaching presence*” involves “instructional management, building understanding, and direct instruction” that encompass design, planning, maintaining focus, considering diverse views, and soliciting input (Garrison et al. 2000, p. 101). Direct instruction promotes “reflection and discourse by presenting content, questions,” summaries, and confirmations that crucially include “explanatory feedback” (Garrison et al. 2000, p. 102).

Garrison et al. (2000) see the three presences as mutually interactive. They postulate that social and teaching presences set “climate,” social and cognitive presences together are “supporting discourse,” and cognitive and teaching presences combine to “select content” (p. 88).

How helpful is the CoI model in graduate online discussion? Putman et al. (2012) judge that “taken together, the three constructs offer a significant framework by which to understand how communities of inquiry in online environments are established and function to foster collaborative processing of course content” (p. 2). But earlier work questioned this position. For Rourke and Kanuka (2009), the key question was whether the CoI framework foretold “deep and meaningful learning” (DML) (e.g., pp. 22–23). They reviewed the literature from 2000 to 2008, finding 252 publications about whether CoI fits DML. Only 5 studies “included a measure of student learning” (p. 19). The articles mainly addressed processes and student perception of learning. Putting aside (“bracketing”) concerns about the quality of the assessments, Rourke and Kanuka (2009) concluded that “the review indicates that it is unlikely that deep and meaningful learning arises in CoI” (p. 19). Given that cognitive presence is proposed to have ascending levels, Rourke and Kanuka (2009) also found that the data mainly supported the two lower levels of achievement in cognitive presence (“triggering events and exploration”) and rarely the higher “integration and exploration” (p. 23).

Shea and colleagues (2012) also assessed CoI, arguing that the framework is importantly incomplete. Their assessment is that to explain student outcomes, including grades, the CoI three-part model must be supplemented by “learning presence” that includes “the exercise of agency and control rather than compliance and passivity and more fully articulates popular beliefs about the importance of self-direction in online environments” (p. 90). Thus, Shea et al. (2012) found that individual student actions were important in explaining learning.

Some data suggest that both social and teaching presence influence cognitive presence. However, Annand’s (2011) review suggests that social presence’s effect on learning has been “overstated” in the literature (p. 42). He opines that: “Rather, appropriately structured learning materials, timely, non-contiguous, one-on-one instructor–learner communication, and a teaching focus that enhances individual learner

attributes and effort may be the best prescriptions for effective online learning in higher education” (p. 49). Annand (2011) also finds quite insufficient data supporting the thesis of knowledge co-construction that CoI supposedly generates (p. 51).

Xin (2012) provided a more conceptual analysis and critique of CoI. One of Xin’s (2012) points is that the tripartite CoI framework would apply to both face-to-face and online education, thus lacking specificity. More fundamentally, Xin reasons that discussion overall is a “communication process” and “Often all three aspects [the presences in the CoI] are performed simultaneously in a single communicative act, e.g., a sentence or paragraph, their precise function depending on what said previously leading up to that point, the contexts, and the dynamics of the discussion” (p. 4 of 14). Hence “communicative functions” play a more central role in discussion than presence (pp. 5–6 of 14) and the latter is instead “an operative component of the discourse” (p. 6 of 14). Xin (2012) further asserts that communicative functions “often encapsulate social, teaching, and cognitive presence” (p. 10 of 14). Such functions “not only maintain the social relations of communication but also contribute to and advance the intellectual engagement of the participants” (p. 10 of 14). Consequently “communication must be continuously and intentionally produced” more emphatically online than in-person because in face-to-face discussion “habits are well established and paralinguistic cues fulfill many communicative functions” (p. 10 of 14).

Failure to capture the role of technology may be another way the CoI framework is incomplete. For example, Rubin et al. (2013) found that how easily the learning management system promoted communication predicted teaching, social, and cognitive presences in CoI (p. 53). Although their study was confined to one university, included were 605 adult students in five schools, fully online courses, 14 instructors, and 43 “unique courses” in 88 sections (p. 53).

Another issue is the ideal number of students in each discussion group. Hew and Cheung (2011) investigated “what relationships (if any) might exist between the frequency of higher level knowledge construction and group size” and found no relevant literature (p. 307). They also assessed 40 discussion forums, all student facilitated, in three courses involving 50 graduate students in education. Excluding facilitators, the numbers of students in discussions were 2 to 10. The investigators found “a significant positive correlation ($r = 0.422$, $P = 0.002$) between group size and the frequency of higher level knowledge construction occurrences” (p. 310). We found no other comparable studies for graduate students. In reviewing related literature in health care education, Thomas (2013) found that studies “with the smallest numbers of only 3–5 in each group appeared to attain deeper levels of reflective or critical thinking” (p. 211). Such putative advantages for very small groups are plausible. But given different learning objectives in the two fields, such results in health care education may not apply to bioethics graduate education.

Finally, we should add that our review failed to produce any significant literature addressing best practices for bioethics graduate education online or in-person.

Discussion Given the above results, what are reasonable conclusions about best practices for discussion in online graduate education and more particularly for bioethics? The matter is unsettled. What are the most promising provisional conclusions for best practices? Several points emerge.

The first provisional best practice is multidimensional: that course design, instructor involvement, and assessment should attend to the four presences—“social” (SP), “teaching” (TP), “cognitive” (CP), and “learning” (LP) as explained above. SP, TP, and CP comprise the standard CoI framework (e.g., of Garrison et al. 2000); the fourth, LP, was added by Shea et al. (2012). Thus courses should ensure student and teacher interactions and provide guidelines such that a conducive atmosphere and actions promote intellectual exchange that fosters “shared meaning construction” (Stahl et al. 2006). On the other hand, major attention to promoting SP may not be warranted. Also, major stress on LP to promote individual student agency is reasonable. (See the next section on feedback).

Kelly (2014) notes discussion’s “potential to bring together [students’] diverse perspectives” and background (p. 7). Promoting such personal additions should enhance SP, CP, and LP. Our graduate bioethics students have a wealth of professional experience, particularly in nursing and medicine and both in practice and academia. Thus these mature students can provide a wealth of provocative and illustrative examples.

Second, Xin’s (2012) analysis suggests that best practices must include major attention to communication functioning and how we should promote it. Just what those practices might be is beyond the present scope.

Third, best practices should include iterative attention to how the technology—the learning management system—influences CoI and learning presences. These systems affect both instructor and student input. In our experience, such technology offers some options for how things are presented and ways interactions can occur.

Of course, expectations for graduate students should be higher than for undergraduates, online or in-person. For example, we require that bioethics graduate students demonstrate more than passing knowledge of required readings and other sources, and in turn, that knowledge should be integrated into the discussions. We also expect, motivate, and guide students to go deeper into sources and comments from instructors and peers than do undergraduates. Graduate students particularly should question and critically review peer contributions and respond to others’ questions. We expect synthesis of discussion content from one week to the next as well.

We failed to identify published literature that delineates anything specific for online bioethics graduate work. However, a later section considers examples in our courses.

Suggested best practices for instructor feedback in graduate online discussions

We assume that instructor feedback is vital for improving students’ graduate learning through discussion. We understand feedback to be giving students comments that aim to help them understand what they are doing well, areas that need improvement, strategies for enhancing their work, and related remarks. We take feedback as a constructive enterprise to advance student learning. Key questions include what feedback to give and how and when to give it during online courses. Also, immediate feedback is infrequently possible during asynchronous online discussion because instructors cannot continuously monitor input and respond. However, online instructors can certainly follow students’ discussion themes and threads regularly and inject questions, note clarification needs, highlight issues, add content and references, and

redirect or correct lines of reasoning as discussion continues. Disrespectful comments can be deleted or otherwise addressed, usually after the fact. And feedback can go to individual students or the group. Given these aims and options, what does the literature tell us?

Results In considering feedback online, Getzlaf et al. (2009) found that literature noted students' preferences for timely and constructive feedback. However, they determined that "there is little research that describes ""what" feedback is useful (content of feedback) and "how" useful feedback is given" (p. 2). The authors do see feedback as part of CoI teaching presence, involving "provision of constructive, critical explanatory feedback that allows students to understand their mistakes and clarify and expand their ideas, not only within the conference [discussion] discourses of the class community but also through individualized feedback between instructor and learner" (p. 3). For Getzlaf et al. (2009)

feedback was defined as information provided from instructors to students about course activities in which students were engaged, including written assignments, conference postings and course interactions. Feedback included both objectivist, product-oriented information (for example, comments provided following evaluation of written assignments) and constructivist, process-oriented information (for example, suggestions to improve the content of online conference postings) (p. 3).

Given this definition of feedback, Getzlaf et al. (2009) provide a useful literature review. They find that: "Several authors of research studies and "best practice" syntheses have identified the importance of feedback and suggested that feedback be prompt, timely, regular, supportive, constructive, meaningful, non-threatening and helpful" (pp. 4–5). However, Getzlaf and colleagues (2009) found minimal investigation about best practices for online instructor feedback (p. 5). Consequently, Getzlaf et al. (2009) surveyed 30 graduate (Master) students in nursing or health studies (but taking courses together), representing 8 courses, students ages 26–52, with just one male. The survey analysis yielded five "themes" of "effective feedback (p. 8):

- "mutual" student and instructor process with individual student focus
- "constructive guidance that builds confidence"
- "gentle guidance" through "explicit guidance and ongoing coaching"
- "timeliness" through specific parameters "mutually" set
- "future orientation" such that feedback applies to what will come

Student views and elaborations about these themes included that student and instructor mutually determine the focus of feedback (Getzlaf et al. 2009, p. 10), that instructors avoid "belittling" students but be "authentic" and "encouraging" (p. 11), "negative feedback should be in manageable chunks" (quote from one unnamed student, p. 12), and feedback prompt (p. 12). Getzlaf et al. (2009) also note the importance of other nuances like brief affirmations of quality work (p. 15).¹

¹ Although according to Getzlaf et al. (2009), feedback includes "constructivist, process-oriented information" (p. 3), Stein et al. (2013) seem to classify strategic advice as coaching. The latter's overview of coaching is interesting but beyond the present scope. Also, Stein et al. (2013) employed assessments using a CoI template that may interest readers.

Finally, deNoyelles et al. (2014) reviewed “Strategies for Creating a Community of Inquiry through Online Asynchronous Discussions” (p. 153). They found that “prompt, but modest instructor feedback” best enhances outcomes of SP and CP (p. 159). The review also showed that peer and instructor commentary fostered higher CP outcomes; the two inputs were complementary (p. 160).

Discussion These results strongly suggest a range of best practices that include logistics (e.g., prompt or timely), specific and organized content (e.g., errors, gaps, positive features, positive–negative–positive), certain orientations (e.g., practical, future-focused), and process strategies that Getzlaf et al. (2009) consider as feedback and Stein et al. (2013) call coaching (e.g., compose and revise offline, justify all generalizations and opinions). In light of these findings, the following example (in abstract) should illustrate a best practice by noting a gap (evidence) and suggesting a strategy: “You wrote that X and Y support Z. But X is an empirical generalization that requires evidence. Show readers why they should accept X.” The last statement invites the student to think about how others would critically respond.

Many approaches could help satisfy these feedback needs. For example, copying and pasting original student comments into instructor comments facilitates precise feedback. Initial positive remarks could include general evaluations and examples of good insights. Constructive comments can explain specific needs for reasons and argument. Final positive statements might compliment engagement with peers and efforts to raise important questions. Written and audio or audio/visual feedback and scheduled conversations can be complementary (deNoyelles et al. 2014). In our experience, telephone or audio/visual synchronous conversations can clarify comments, address challenges or needs that students may hesitate to express in writing, and promote a safe setting for students to admit concerns. Then further feedback can follow.

An important issue we have not addressed is how to ensure that students consider and constructively respond to feedback. While a key topic generally, addressing this area is beyond the present scope.

Suggested best practices for online bioethics graduate discussions: program examples

The above results and discussion about provisional best practices draw on undergraduate and graduate assessments. Our view is that graduate discussions should help students learn how to develop more extensive and deep analyses, better reasoning and arguments, and how to digest background material of greater complexity and volume than for undergraduate discussions. Our literature review did not find specific best practices for bioethics. Rather, we pooled our knowledge and drew from the literature regarding graduate discussions, education, and the field of bioethics as we developed our graduate program. We next explain our general pedagogical strategies and then illustrate discussion approaches in our program for the Master of Science in Health Care Ethics. In the process we relate our examples back to the prior literature results and related discussion.

General strategies The core faculty drafted and agreed on program learning objectives. Then faculty “course directors” designed courses in light of those objectives. The

Curriculum Committee, a subgroup of core program faculty and adjuncts, reviews prospective and substantially changed course guides and syllabi. After a version is acceptable to the Program Director and the Curriculum Committee, the Program Committee of all core faculty approves the course or suggests revisions. This process proceeds iteratively until the course design is approved. Course Directors are also responsible for reviewing evaluations, revising courses, and advising or otherwise supporting course instructors.

Consistent with the literature reviewed above, we have found that the following items are helpful general strategies for creating online graduate bioethics environments that foster productive, rigorous, and respectful discussions in our diverse communities of learners. Our remarks on the strategies link these features back to the CoI framework presences of social, teaching, and cognitive (e.g., see Garrison et al. 2000) and the learning presence that Shea et al. (2012) propose.

- Syllabus/course guide with detailed instructions, expectations, and evaluation rubrics for required discussions. (These aspects connect to the teaching presence in the CoI framework.)
- Weekly assignments (readings, films, etc.) and guidance in the online interface—another form of teaching presence. (Our courses are each 8 weeks and usually divided into weekly units that aim for a cohesive whole over the course.)
- Weekly discussion topics and requested responses to peer remarks, connected to readings, other materials, and course objectives. (Students are commonly asked to draw on prior weeks' material in their comments.) Drawing on teaching presence, these requirements build cognitive and learning presence. Learning presence flows from independent needs to read materials and construct initial remarks and responses. Student and instructor responses foster collaborative inquiry that generally builds community. Our students are usually professionals who draw on major experiences in their remarks. They often note challenges and lessons that foster social presence (Garrison et al. 2000).
- Questions, a request to address a specific issue, or a less specific assignment to select and discuss one or more items from the sources to encourage analysis, exploration, creativity, and constructive exchange. (These requirements employ teaching presence to build cognitive presence. However, peer student responses may accomplish and ideally do accomplish related aims.)
- Instructor responses in discussions that can include promoting further inquiry about an issue, providing clarifications or new information, and correcting mistakes. (Such responses are another aspect of teaching presence. All instructors monitor discussion; instructors optionally engage in discussion threads.)
- Individual and concrete instructor feedback following each week's discussion and otherwise as needed. General feedback to the class is provided as deemed helpful. Feedback in either case can be through text, audio, and/or audio-visual means as instructors consider best. (As discussed in the earlier section on feedback, feedback aims to promote learning through noting positive work, errors, and needs. Strategies may also be included. Again, the specifics depend on instructor choices.)
- Optional or required (instructor preference) synchronous conversations between student and instructor (telephone, audio-video) to address issues, challenges, and needs that students may hesitate to raise in the discussion or the course messaging system.

- Instructor monitoring for respectful commentary and editing of student remarks as needed. (See earlier comments about this option, including restraints posed by the asynchronous online mode.)

Specific strategies We have developed several methods for helping students (1) draw upon curricular and course content to engage practical, real-life issues and (2) cultivate and enhance analytical skills such as argumentation, reasoning, and justification. Two detailed illustrations follow.

Example 1: practical ethics in health care settings The 8-week course, MHE 607 Practical Ethics in Health Care Settings, has six separate discussions. Each student must provide an “Initial Post” limited to 500 words on an assigned topic and then at least two replies in that specific discussion. (As noted, initial post and responses involve learning presence through student agency, build cognitive presence, and commonly social presence.) The instructor provides feedback to each student after each discussion session ends, including a completed grading rubric that notes areas for improvement.

Discussion week 1 Students must ask two people not affiliated with health care or the course what they know about ethics committees in health care settings. Instructor questions are: What is an ethics committee? What do ethics committees do? Why would you need or use one? (This exercise cultivates learning presence.)

In their initial post students summarize what interviewees said *and* what the responses reveal about ethics committees and the relevance of ethics committees in health care. Students also describe what surprised them. (This aspect promotes social presence, among other things.)

The assignment aims to encourage exploration and exchange of ideas about ethics committees’ basic functions and utility, building cognitive presence and aiming for “deep and meaningful learning” that Rourke and Kanuka (2009) highlight as noted earlier. The assignment directions require field research in the form of personal interviews on a topic students have just begun to study in the course. Yet, compared to lay people, the students soon find that they already know quite a lot more about the functions/roles of ethics committees, and they accordingly enrich the discussion. Student comments also draw on readings about historical development of ethics committees and their standard functions, i.e., education, policy review and development, and case consultation. (Such synthetic activities are typical requirements that build a rich discussion and a strong sense of communal sharing as a course proceeds.)

The back-and-forth, asynchronous discussions promote student sharing of multiple insights. Examples are: (1) differences between what they know to be “true” about ethics committees and what people think about ethics in health care overall, not just issues that ethics committees address; (2) numerous problems arise from the interviewees that the course instructor has not identified for the students; (3) surprising differences within the students’ families who are often interviewees in values and health care decisions; (4) gaps between public understanding of ethics committee functions and reality; and (5) public ignorance about such committees’ existence and potential impacts on interviewees’ own care. Students also ask questions like: “Does age make a difference? Education? Cultural factors? Religious beliefs?” (Sharing

interview findings and the ensuing discussion promote cognitive presence and social presence that supports discourse about what the student knows versus what others know.)

The discussion in response to this assignment is robust and rich. The students are generally so engaged that the course instructor mainly needs to comment on interesting findings and insights, another way to employ teaching presence. The discussion assignment supports cognitive presence by requiring issue identification, promoting related idea exchange, and integrating content from course readings (Garrison and Arbaugh 2007).

Discussion week 5 The discussion addresses institutional policy on accessing a hospital ethics committee. Students locate a pertinent policy (promoting learning presence) on how an ethics consultation is conducted in their institution or elsewhere (online policies are widely available). Students learn how ethics consultations are initiated, who is involved, and what happens. In discussion, students are to attach the policy and answer the following questions: Is the policy clear about how to ask for a consultation and what will happen? If not, what would you change? Put yourself in the position of a patient or family member. What would you think of the policy from that perspective? (Answering these questions promotes cognitive presence.)

The assignment invites students to engage with a realistic clinical task, i.e., finding the appropriate policy to guide and inform their actions as it also asks them to provide critical assessments and responses. Comparing and contrasting colleagues' policies promotes collaborative learning as the students apply readings from a previous week on policy development. As Stahl et al. (2006) note, the students make meaning in discussing their findings. We add that proffering constructive criticism to peers also promotes skill development.

These tactics exemplify what we above discussed as provisional best practices, in that the students are motivated to project themselves socially and emotionally into an important and common concern in clinical ethics: supporting patients, families, and health professionals through the ethics consultation process. Their findings, critiques, and attitudinal responses then flow into discussion, thus promoting cognitive, social, and learning presence (Garrison et al. 2000, p. 89; Shea et al. 2012).

Example 2: theories of justice In our online graduate course MHE 606 Theories of Justice, students contribute regularly to discussions designed to encourage collaborative learning, exchange ideas, identify areas of consensus and disagreement among peers, and formulate substantive responses and contributions to the inquiry. One strategy for cultivating interactions and shared meaning-making opportunities among students emphasizes students' direct engagement with the course content. (See earlier remarks about "shared meaning construction" noted by Stahl et al. (2006).) The instructor assesses their performance and discussion content weekly regarding mutual engagement and responsiveness to the instructor's questions. Drawing on readings, films, instructor comments, and peer input, students contribute at least three different kinds of posts weekly according to the following instructions:

The required posts per week should be regarded as students' best thought so far on the designated topics, which students are publishing for review by all members

of the class for the purposes of motivating substantive discussion, analysis of ideas, well-considered reflection, and shared intellectual and emotional responses to theoretically challenging material in the philosophy of justice.

“Initial Posts” are limited to 400 words. In their contributions students must respond to the instructor’s discussion question and should reflect text-based and film-based course content. In their responses students must integrate quotations from at least three readings that week. The rationale is that working tightly with the texts promotes deeper understanding of complex theoretical material and discourages mere opinions. Early feedback often needs to address student tendencies to summarize rather than develop new ideas. A rubric has benchmarks for students’ interpretive and analytical engagement with the course materials and prompts them to be insightful, original, and responsive.

Students must also contribute at least two “Response Posts” in discussion that summarize a peer’s point and then *augment* or *problematize* it. They might note an overlooked distinction, a new hypothesis, or faulty reasoning. Overall the new content should motivate clearer understanding of the topic thread. (A “topic thread” is a sequential discussion in which participants build on earlier remarks, all related to the original topic.)

The Initial and Response Post assignments aim to facilitate collaborative inquiry into theoretical content. In this designer-instructor’s experience (CR), the results are often interesting, important, and complex. Following best practices we outlined earlier, the instructor regularly facilitates discussion interactions through public and private feedback to students. (It should now be evident how these student and instructor activities and requirements promote the four presences discussed earlier regarding the CoI framework.)

Discussion contributions often model insightful moral reasoning and originality, demonstrate creative engagement with moral philosophical problems under study, and commonly express cognitive and affective struggles with complexities and ambiguities. Students tend to share how critical reflection in the course links with their own practice-based challenges.

These elements combine and promote social, cognitive, and learning presence. The instructor manifests teaching presence in multiple ways through discussion guidelines, public thread comments, and individual feedback.

Models for online discussions: student initial posts and subsequent responses-program examples

Earlier sections summarized the general aims of graduate online discussion, including the provisional aims of promoting student learning through a community of inquiry involving social, teaching, cognitive, and learning presences (Garrison et al. 2000; Shea et al. 2012). Regarding discussion, we found no specific best practices for the relationship between required initial posts and following responses that students must provide. As our above examples show, general aims include deepening and broadening analysis in ways that often invite students to draw on their own experiences. Given such general aims, our courses employ two quite different strategies.

To promote independent thinking in some courses, students post initial discussion comments about an assigned issue before they can see peers' remarks. In this "post-first" method, students craft their independent responses and then can compare and contrast their post to those of their peers. However, if all students address the same topic, redundancy is a risk. We have not systematically investigated this issue. Our general impression is that the students' postings are sufficiently varied.

Another discussion format allows that one, and only one, student in the discussion group can provide the initial post (A) on a given topic. (The technical interface allows this strategy.) Just one, and only one, different student can then post a response (B) to (A). The response (B) is the "initial post" for the second student. Then a third student can, and only can, post a response (C) to post (B). And so forth. However, students may labor to develop (B) only to find that another student has already posted (B), and so forth. Student evaluations have not raised concerns about this possible inconvenience. Our literature review did not reveal comparative assessments of these two approaches.

We earlier noted some literature about discussion group size (Hew and Cheung 2011). Our impression is that six-eight students per discussion group works well because reading peer online submissions and responding is then a manageable load. However, we have not formally studied the issue. Fortunately, the online interface makes it easy to divide students into groups such that they can only see the posts of other students in their group. Our upper limit for students is 20 per course. When the numbers approach 20 we divide students into two or three discussion groups.

Assessing student learning related to online discussions: strategies and outcomes-program examples

Online learning environments and advances in instructional technology create novel assessment challenges and opportunities. So far we have noted assessments related to the CoI framework. More generally, an online learning environment that relies heavily on asynchronous interactions requires a structured, formative assessment approach, including clear criteria for participation and quality of work (Wyss et al. 2014). Such assessment should also utilize reflective or metacognitive elements that facilitate peer-assessment and provide opportunities to self-assess (Vonderwell et al. 2007). In the following sections we summarize our overall approach to assessment in our online graduate program and then specifically consider discussion.

The role of assessment To assess student learning and facilitate continuous program improvement, we use a comprehensive strategy that includes *direct* and *indirect* methods to gather data before, during, and after students complete the program. Faculty *directly* assess student learning in courses with formative and summative assessment measures. Formative measures, such as ongoing feedback from faculty, graded assignments, and other assessments embedded within each course, are used to promote learning and determine whether students meet course learning objectives. Examples are papers, group projects, group discussions, critical self-reflection, peer review, literature reviews, and presentations. As a summative measure of having met all learning outcomes, students must synthesize content and integrate knowledge and skills acquired through successful completion of previous core courses to develop a practicum project and capstone paper on a theme related to their experience, applying

scholarly methods of bioethical inquiry and composition. When *indirectly* assessing student learning related to graduate program objectives, we mainly rely on qualitative methods to collect summative data that will help inform changes and refinements to curriculum, the learning environment, and instructional strategies. For example, we regularly collect qualitative feedback provided by students and recent graduates through reflection essays, graduate exit surveys, and graduate focus groups.

Assessing the impact of online discussions With two exceptions, all courses in our bioethics curriculum require participation in weekly online discussions. The two courses requiring less frequent discussion are both writing-focused: the mandatory MHE 600 Scholarly Reading and Writing Course and the concluding MHE 609 Capstone Course that focuses on developing a final paper. As illustrated above, faculty use constructive feedback, rubrics, and peer responses as direct, formative measures to assess student learning in the weekly discussions.

Direct assessment methods embedded within the course are the primary ways that faculty evaluate student learning, related to specific course objectives. Indirect methods can also show how instruction influences learning, critical thinking skills, and affective growth (Henckell 2011). Such insights allow us to assess student learning related to the overarching graduate program objectives. For example, our students' qualitative feedback from indirect assessment methods consistently reflect *increased appreciation for differences*, where complex ethical issues are reframed through critical discourse. As one alum stated:

The variety of course topics was continually stimulating and required deeper consideration in many areas. It was very helpful and informative to discuss these topics with the other students, who have a common interest in bioethics but varied life experiences, making learning from their perspectives very interesting (December 2013 Graduate, emphasis added).

As noted earlier, literature supports the important role of online discussions in helping students think deeply about course content, "expressing thoughts, rethinking values, and applying learned material to new issues" (Hamann et al. 2012, p. 72). A core aim in our program and through discussion is to enhance bioethics graduate students' critical analysis skills. Rethinking values is also crucial because students may find that after deeper reflection, some values should be revised. And since the focus is ethics, students are commonly induced to reassess and comment on their values.

In contrast to in-person settings, the online learning environment often creates a different dynamic *both* between students and instructor *and* students with peers. As noted earlier, such mutual engagement, albeit asynchronous, can enhance student opportunities for scholarly discourse. All in the community of learners can share in the learning process, "democratizing the classroom" (Hamann et al. 2012). For example, our students often comment on the value of different voices:

I have learned new perspectives and accumulated some excellent resources along with my newfound knowledge. The dialogue between classmates has been especially helpful and has provided a more multi-faceted learning experience. The experiences that my colleagues have brought to the discussion forum have

helped me better appreciate the nuances of the concepts we were learning (August 2013 Graduate, emphasis added).

As noted, our online discussions are meant to support learning and the specific learning objectives for the course. In ways we explained, embedded formative assessments (i.e., instructor feedback, rubrics, etc.) aim to support, direct toward, and demonstrate deeper learning. Thus teacher presence is variously at work. For further information about assessment we refer readers to Gikandi's et al. literature review on formative assessment (2011).

Limitations

Our review targets asynchronous and text-based online discussion. We have not addressed synchronous audio or audio-visual online approaches that may add advantages, nuances, and challenges. We found no published assessment of online bioethics graduate discussion. Our discussion evaluation approaches and outcomes are summarized, but we do not have assessments that necessarily speak to best practices. Although we addressed at some length the CoI framework and related presences (social, teaching, cognitive, learning), we have not assessed our program for specific CoI content. Our summaries of what works in two graduate and online bioethics courses may not be generally applicable. Specific bioethics content in principle could alter best practices. For example, best practices for a bioethics graduate program focused on clinical consultation could be different than those for a more broadly focused program like ours in health care ethics.

Conclusions

Group discussions are a vital strategy in graduate bioethics learning. Online approaches pose both advantages and challenges in contrast to in-person discussions. For asynchronous text-based learning online, challenges are lack of visual or auditory cues and technical access. Advantages include extended opportunities for specific focus, thoughtful reflection, and critical review. A literature search did not yield a comprehensive review of related best practices in bioethics. Our more general literature review of graduate education and online approaches, plus experience in our own bioethics graduate program, suggest provisional best practices that we detail. Online discussion provisionally should aim for a "community of inquiry" framework that incorporates cognitive, social, teaching, and learning "presences" that promote collaborative learning (Garrison et al. 2000; Shea et al. 2012). However, the framework has limitations. The asynchronous online mode enables sustained and rich exchange, thoughtful reflection, and constructive criticism. Discussion can be variably structured, but no relevant evaluative literature relating to structure was found. Timely and detailed instructor feedback to students about their discussion performance is crucial. Feedback should include positive features, future orientation, and strategic advice. Detailed examples from two graduate courses show how we develop communities of inquiry. An online

learning environment that heavily employs asynchronous interactions requires a structured, formative assessment approach, including clear criteria for participation and quality of work (Wyss et al. 2014). The structured asynchronous approach also promotes student self-assessment. Embedded formative assessments in discussion (instructor feedback, rubrics, etc.) support and demonstrate deeper learning.

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References

- Akyol, Zehra, and D. Randy Garrison. 2008. The development of a community of inquiry over time in an online course: understanding the progression and integration of social, cognitive and teaching presence. *Journal of Asynchronous Learning Networks* 12(3–4): 3–22.
- Akyol, Zehra, J. Ben Arbaugh, Marti Cleveland-Innes, D. Randy Garrison, Phil Ice, Jennifer C. Richardson, and Karen Swan. 2009a. A response to the review of the community of inquiry framework. *Journal of Distance Education* 23(2): 123–135.
- Akyol, Zehra, D. Randy Garrison, and M. Yasar Ozden. 2009b. Online and blended communities of inquiry: exploring the developmental and perceptual differences. *International Review of Research in Open and Distance Learning* 10(6): 65–83.
- Annand, David. 2011. Social presence within the community of inquiry framework. *International Review of Research in Open and Distance Learning* 12(5): 40–56.
- Craig, Gloria P. 2013. Evaluating discussion forums for undergraduate and graduate students. *Online CI@ssroom* 13(12): 5. 8.
- Darabi, Aubteen, and Li Jin. 2013. Improving the quality of online discussion: the effects of strategies designed based on cognitive load theory principles. *Distance Education* 34(1): 21–36. doi:10.1080/01587919.2013.770429.
- deNoyelles, Aimee, Janet M. Zydney, and Baiyun Chen. 2014. Strategies for creating a community of inquiry through online asynchronous discussions. *MERLOT Journal of Online Learning and Teaching* 10(1): 153–165.
- Garrison, D. Randy, and J.B. Arbaugh. 2007. Researching the community of inquiry framework: review, issues, and future directions. *The Internet and Higher Education* 10(3): 157–172. doi:10.1016/j.iheduc.2007.04.001.
- Garrison, D. Randy, and Martha Cleveland-Innes. 2005. Facilitating cognitive presence in online learning: interaction is not enough. *American Journal of Distance Education* 19(3): 133–148.
- Garrison, D. Randy, Terry Anderson, and Walter Archer. 2000. Critical inquiry in a text-based environment: computer conferencing in higher education. *The Internet and Higher Education* 2(2–3): 87–105.
- Getzlaf, Beverley, Beth Perry, Greg Toffner, Kimberley Lamarche, and Margaret Edwards. 2009. Effective instructor feedback: perceptions of online graduate students. *The Journal of Online Education* 6(2): 22.
- Gikandi, J.W., D. Morrow, and N.E. Davis. 2011. Online formative assessment in higher education: a review of the literature. *Computers & Education* 57(4): 2333–2351. doi:10.1016/j.compedu.2011.06.004.
- Hamann, Kerstin, Phillip H. Pollock, and Bruce M. Wilson. 2012. Assessing student perceptions of the benefits of discussions in small-group, large-class, and online learning contexts. *College Teaching* 60(2): 65–75. doi:10.1080/87567555.2011.633407.
- Henckell, Martha. 2011. Assessing student learning online. In *Teaching the humanities online: a practical guide to the virtual classroom*, ed. Steven J. Hoffman, 125–140. Armonk: M.E. Sharpe.
- Hew, Khe Foon, and Wing Sum Cheung. 2011. Higher-level knowledge construction in asynchronous online discussions: an analysis of group size, duration of online discussion, and student facilitation techniques. *Instructional Science* 39(3): 303–319. doi:10.1007/s11251-010-9129-2.
- Hosler, Kim A., and Bridget D. Arend. 2012. The importance of course design, feedback, and facilitation: student perceptions of the relationship between teaching presence and cognitive presence. *Educational Media International* 49(3): 217–229.
- Joubert, Marie, and Jocelyn Wishart. 2012. Participatory practices: lessons learnt from two initiatives using online digital technologies to build knowledge. *Computers & Education* 59: 110–119.

- Kelly, Rob. 2014. How to foster critical thinking, student engagement in online discussions. *Online CI@ssroom* 14(1): 7–8.
- Kozan, Kadir, and Jennifer C. Richardson. 2014. Interrelationships between and among social, teaching, and cognitive presence. *Internet and Higher Education* 21: 68–73.
- Putman, S. Michael, Karen Ford, and Susan Tancock. 2012. Redefining online discussions: using participant stances to promote collaboration and cognitive engagement. *International Journal of Teaching and Learning in Higher Education* 24(2): 151–167.
- Rourke, Liam, and Heather Kanuka. 2009. Learning in communities of inquiry: a review of the literature. *Journal of Distance Education* 23(1): 19–48.
- Rubin, Beth, Ron Fernandes, and Maria D. Avgerinou. 2013. The effects of technology on the community of inquiry and satisfaction with online courses. *Internet and Higher Education* 17: 48–57.
- Sayers, Adrian. 2007. Tips and tricks in performing a systematic review. *The British Journal of General Practice* 57(542): 759.
- Shea, Peter, Suzanne Hayes, Jason Vickers, Mary Gozza-Cohen, Sedef Uzuner, Ruchi Mehta, Anna Valchova, and Prahalad Rangan. 2010. A re-examination of the community of inquiry framework: social network and content analysis. *Internet and Higher Education* 13(1–2): 10–21.
- Shea, Peter, Suzanne Hayes, Sedef U. Smith, Jason Vickers, Temi Bidjerano, Alexandra Pickett, Mary Gozza-Cohen, Jane Wilde, and Shoubang Jian. 2012. Learning presence: additional research on a new conceptual element within the community of inquiry (CoI) framework. *Internet and Higher Education* 15(2): 89–95.
- Stahl, Gerry, Timothy Koschmann, and Daniel D. Suthers. 2006. Computer-supported collaborative learning. In *Cambridge handbook of the learning sciences*, ed. R.K. Sawyer, 409–425. West Nyack: Cambridge University Press.
- Stein, David S., Constance E. Wanstreet, Paula Slagle, Lynn A. Trinko, and Michelle Lutz. 2013. From ‘hello’ to higher-order thinking: the effect of coaching and feedback on online chats. *Internet and Higher Education* 16: 78–84.
- Thomas, Jenny. 2013. Exploring the use of asynchronous online discussion in health care education: a literature review. *Computers & Education* 69: 199–215.
- Vonderwell, Selma, Xin Liang, and Kay Alderman. 2007. Asynchronous discussions and assessment in online learning. *Journal of Research on Technology in Education* 39(3): 309–328. doi:10.1080/15391523.2007.10782485.
- Wang, Qiyun, and Huay Lit Woo. 2007. Comparing asynchronous online discussions and face-to-face discussions in a classroom setting. *British Journal of Educational Technology* 38(2): 272–286.
- Wyss, Vanessa L., Debra Freedman, and Cathy J. Siebert. 2014. The development of a discussion rubric for online courses: standardizing expectations of graduate students in online scholarly discussions. *TechTrends* 58(2): 99–107. doi:10.1007/s11528-014-0741-x.
- Xin, Cindy. 2012. A critique of the community of inquiry framework. *Journal of Distance Education* 26(1): 1–14.