

# Investigating the Use of Online Discussions in an Undergraduate Face-to-face Course

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**Abstract:** This paper uses Garrison, Anderson and Archer's (2000) Community of Inquiry framework to investigate the levels of cognitive and teaching presence within online discussions as a component of an undergraduate face-to-face course. Online discussion was used to support face-to-face learning and teaching. The student and instructor online postings were analyzed using the indicators of cognitive and teaching presence within the Community of Inquiry framework. Although the instructor actively participated and facilitated online discussions, the course was not designed for pre-service teachers to move through all four phases of cognitive presence. This paper examines the levels of engagement that pre-service teachers who had enrolled in a face-to-face course, utilised non-compulsory online discussion forums to enhance their learning.

As educators we should engage our pre-service teachers in appropriate, purposeful work with technology that transforms learning opportunities in ways that make them more relevant to the needs of the 21<sup>st</sup> century. Even when using technology, some educators fail to use online environments to “capture, motivate or retain the learning” (Prendergast, 2004). Laurillard (1999) commented that learners need multiple cognitive opportunities to connect theory and practice by “engaging in attention, enactment, reflection, critique, adaptation, [and] articulation” (p. 136). Online environments can be used to enhance face-to-face learning and provide increased opportunities for dialogue and access to supporting information.

## Online and face-to-face learning

A range of researchers have discussed the relative advantages and disadvantages of both the face-to-face and online mediums in regard to teaching and learning (Garrison & Kanuka, 2004; Groves & O'Donoghue, 2009; Hannum & Briggs, 1982; Wuensch, Aziz, Ozan, Kishore, & Tabrizi, 2008). It could be said that traditional face-to-face learning environments are dynamic, fast paced and spontaneous, with contagious energy. There is a natural social and spatial awareness through visual and verbal cues. The face-to-face medium provides immediate and multiple sources of feedback for the instructor (e.g., body language, facial expressions) to enable them to modify instruction on the run. For many, there are also perceived time efficiencies in having all students available at the one time.

In contrast, face-to-face environments in university contexts are often criticized as being teacher centred, particularly if they have a focus on lecture presentations. Traditional or face-to-face instructional environments have been frowned upon when they encourage passive learning, and ignore the individual differences and needs of the learners. In many instances, the pedagogical approaches do not pay attention to problem solving, critical thinking or other higher order thinking skills.

One of the identified advantages that online environments have over face-to-face modes of teaching and learning are that they provide flexible and convenient access to content, peers and the teachers. Online discussions afford a permanent record where ideas can build over time with multiple opportunities to participate. Asynchronous discussions offer additional time for research and considered response in addition to encouraging reflection. There is an increasing range of tools to promote interaction and communication; and the technology itself can ‘level the playing field’ because differences such as race, gender, disabilities are hidden or less visible. Online learning can provide both asynchronous and synchronous access to content and people.

Online environments are not free from criticism however. Barriers such as lack of regular access; ease of access to technology; and the inconsistency of stability and speed of access to networks impact on the efficiency and effectiveness of learning and teaching online. Online environments can provide students with delayed feedback. For some students there is an additional time consideration while attempting to decode the interface. Also increased frustration can occur if instructor messages get lost amongst other materials and messages in forums.

Despite these differences, research also indicates that there is no significant difference in the learning outcomes and student satisfaction when comparing face-to-face and online learning (Russell, 1999; Wuensch, Aziz, Ozan, Kishore & Tabrizi, 2008). To assist in developing an understanding of the multifaceted nature of these new models of teaching and learning, Akoyol, Garrison and Ozden (2009) suggest that the community of inquiry framework can be used to guide the complex and dynamic nature of technologically enhanced learning environments.

## Community of inquiry

Based on the social constructivist approach to teaching and learning, a community of inquiry can “provide the condition for free and open dialogue, critical debate, negotiation and agreement” (Garrison & Kanuka, 2004, p. 97). It is made up of three overlapping elements or presences: social, cognitive and teaching. This paper will focus on cognitive and teaching presences.

- Garrison (2009) proposes that social presence is “the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities” (p. 352).
- Cognitive presence is “the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse” (Garrison, Anderson & Archer, 2001, p. 11).
- Teaching presence has an essential role in integrating all three presences. Anderson, Rourke, Garrison and Archer, 2001 define it as “the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (p. 5).

## Cognitive presence

Cognitive presence is described by Garrison and Anderson (2003) as “the intellectual environment that supports sustained critical discourse and higher-order knowledge acquisition and application” (p. 55). Cognitive presence indicators provide a tool to judge the quality of the discussion and reflection in achieving deep knowledge and higher order thinking. Table 1 shows the phases and indicators of cognitive presence. Each phase is then briefly described below.

<i>Phase</i>	<i>Descriptor</i>	<i>Indicator</i>
Triggering event	Evocative (inductive)	Recognize problem Puzzlement
Exploration	Inquisitive (divergent)	Divergence Information exchange Suggestions Brainstorming Intuitive leaps
Integration	Tentative (convergent)	Convergence Synthesis Solutions
Resolution	Committed (deductive)	Apply Test Defend

**Table 1:** Cognitive presence descriptors and indicators

*Note.* From *E-learning in the 21st century: A framework for research and practice* (p. 61), by D. R. Garrison and T. Anderson, 2003, New York: Routledge. Reprinted with permission.

- Triggering event: “an issue, dilemma or problem that emerges from experience is identified or recognized” (Garrison, Anderson & Archer, 2001, p. 10). This event is often shaped or staged by the teacher, although it may be articulated by the students as a result of discussions based around stimulus material, tasks or questions.
- Exploration: initially “students are required to perceive or grasp the nature of the problem, and then move to a fuller exploration of relevant information”. They then go on to “begin to be selective with regard to what is relevant to the issue or problem. This is a divergent phase characterized by brainstorming, questioning, and exchange of information” (Garrison, Anderson, & Archer, 2001, p. 10).
- Integration: is when students connect multiple sources of information and perspectives to begin to construct tentative solutions to their initial dilemma or problem.
- Resolution: is where the learner “critically assesses the viability of the proposed solution through direct or vicarious application” (Garrison & Anderson, 2003, p. 62).

With the support of effective teaching presence and explicit instructional design, learners are able to move through these phases and gain an understanding of both the theory and practice of their discipline.

### Teaching presence

Garrison and Anderson (2003) have identified three key elements of teaching presence. Firstly, instructional design and organization: the majority of this element is completed prior to the learners entering the learning environment. Secondly, to facilitate discourse, this element can be undertaken by a range of participants including the teacher, the learners, and online experts. Thirdly, there is direct instruction which includes the provision of additional supportive information or materials, the diagnosing of misconceptions and other interventions to support learners. Table 2 provides the categories and indicators of teaching presence.

<i>Teaching Presence Categories</i>	<i>Indicators</i>
Instructional Design and Organization	Setting the curriculum Design methods Establishing time parameters Utilizing medium effectively Establishing netiquette Making macro-level comments about course content
Facilitating Discourse	Identifying areas of agreement/disagreement Seeking to reach consensus/understanding Encouraging, acknowledging, or reinforcing student contributions Setting climate for learning Drawing in participants, promoting discussion Assessing the efficacy of the process
Direct Instruction	Present content/questions Focus the discussion on specific issues Summarize the discussions Confirm understanding through assessment and explanatory feedback Inject knowledge from diverse sources Responding to technical concerns

**Table 2:** Teaching presence categories and indicators (Garrison & Anderson, 2003)

There is a significant amount of previous research using the Community of Inquiry framework in the areas of online post graduate learning and blended professional learning. This research uses the framework to analyze how undergraduate pre-service teachers use online discussion areas in a course which is primarily face-to-face.

### Methodology

The research context for this study was an undergraduate teacher education course which explored policy, pedagogical approaches and knowledge of quality teaching for diversity and inclusivity. This course aimed to move beyond the traditional social justice approach of diversity. It challenged the students to acknowledge that diversity is

inherent in all populations and that the preferred educational response is that of inclusion. The course explored Universal Design for Learning (UDL) as a model which allowed for a rich response to the individual differences of learners. As part of their assessment, they were required to apply the UDL approach to planning for diversity within their professional experience placement. The students were in their third year of a four year teacher education program and were spread across three different campuses with local tutors at each campus.

This was a face-to-face course and the instructor provided pod-cast lectures, face-to-face tutorials and face-to-face workshops. The online environment used the learning management system WebCT and provided online discussions to support face-to-face learning and access to core and supplementary learning materials. All students were required to access formal course materials (e.g., assessment details) and the pod-cast lectures from the online space. Every course, irrespective of mode (face-to-face, external or online), had an online space and the university had mandated that learning materials and online discussion opportunities must be provided to all students. The online communication was solely text based. The instructor created a number of forums to support different areas of the course (e.g., assignment 1 and topic 1). Within the forums that related to the course content, the instructor posted questions, images, videos etc. to stimulate the initial online conversations. Although all students had access to the online environment, not all students availed themselves of the opportunity to interact online and online participation was not assessed. For the purposes of this study, informed consent was sought from two tutorial groups from one of the campuses. Permission to analyze online postings was received from thirty-five pre-service teachers and the course instructor.

The two key questions for this study to investigate are:

1. What use do undergraduate teacher education students make of online discussion forums within a face-to-face course?
2. What use do instructors make of online discussion forums within a face-to-face course?

The archives from the online discussions within one content forum provided the data for analysis. The students' postings were coded against the four phases of cognitive presence using the categories and indicators in Table 1. The teaching presence coding protocols from the community of inquiry were used to analyze the instructor's postings drawing on the categories and indicators in Table 2.

Cognitive presence and teaching presence were assessed using content analysis of the online discussion posts. For the purposes of this study, a single message or post can be identified as the unit of analysis. Within a message, each unit is clearly identified and "the length and content of the message is [sic] decided upon by its author" (Garrison et. al., 2001, p. 17). If the post contained more than one level or phase, the message was coded up to the highest level.

## Results and discussion

Cognitive presence seeks to promote inquiry and higher order thinking. The four phases of cognitive presence provide a framework to analyze the online posts and to evaluate the number and depth of postings where students make their private knowledge building publicly visible. Table 3 indicates the number and percentage of student postings at each phase of cognitive presence within one of the content forums.

Presence	Phase	Number of posts	%
Cognitive presence	Triggering	0	
	Exploration	75	97%
	Integration	2	3%
	Resolution	0	
Total		77	100%

**Table 3:** Frequency of pre-service teachers' online postings

Within this forum, a triggering event was presented by the instructor. This was in the form of images collected from the World Health Organisation's website and focused on the diversity of populations. These images created a sense of dissonance or conflict in the students and were used to stimulate both face-to-face and online

discussion. It was unusual for there to be no triggering posts by the students. Perhaps the triggering comments were all completed in the face-to-face class where they could get an immediate response. In the online space, students went straight to the exploration phase, rather than use the online space to display their sense of puzzlement.

“Exploration takes place in a community of inquiry by iteratively moving between the private and shared worlds—that is, between critical reflection and discourse” (Garrison, Anderson, & Archer, 2001, p. 10). In terms of the students’ posts, there were an overwhelming number of posts at this second stage. The high number of posts should not be unexpected given that it is characterized by learners searching broadly for possible solutions or information related to the initial dilemma. Within the exploration category, the *information exchange* indicator produced more than half of the posts. This is where the students shared personal narratives, literature or resources and posted questions for clarification. The next most common area of exploration was in the *suggestions for consideration* indicator, where the students elicited “comments or responses as to the value of the information or ideas” (Garrison & Anderson, 2003, p. 62). The large number of exploration posts paralleled results from other papers (Fahy, 2002; Garrison, Anderson & Archer, 2001; Kanuka, Rourke & Laflamme, 2007; McKlin, Harmon, Evans, & Jones, 2001; Meyer, 2003; Pawan, Paulus, Yalcin, & Chang, 2003; Redmond & Mander, 2006).

It was disappointing to see a minimal number of integration postings. During this phase learners analyzed and synthesised information gathered within the exploration phase to construct tentative explanations or solutions. The low number of posts may have been because the learners were not asked to resolve anything as part of their learning activities or assessment. Alternatively, the integration and resolution phases may have been born out in the activities which were completed in face-to-face classes rather than in the online discussion. Akyol, Arbaugh, Cleveland-Innes, Garrison, Ice, Richardson & Swan (2009) suggest that we should expect a larger number of responses in the exploration phase when compared to other phases because it “involves investigating all ideas, whereas integration seeks to combine promising ideas, and resolution seeks to focus on a single or just a few solutions” (p. 130). It is suggested by other researchers (Ice, Akyol, & Garrison, 2009; Redmond & Mander, 2006; Shea & Bidjerano, 2009) that the nature of the learning design and other elements of teaching presence greatly impacts the levels of student cognitive presence. In this case, students were not required nor requested to ‘come up with a solution’ and move through the four phases of cognitive presence.

Interestingly, sixteen of the thirty-five students who completed the informed consent forms did not post anything in the forum analyzed. Although at the beginning of the semester these sixteen students believed that they would have postings to contribute to this research, further exploration shows that not only did they not post in the forum investigated for this paper, but they did not post in any forums within the online space. These students did not see benefits in extending their learning through online discussions although they did use the online space to access the pod-casts and other mandatory course materials and information. At that time, the instructor was a novice in the area of blended learning and did not make contact with those students who did not post online or encourage them to do so. Had there been additional contact by the instructor and a change in teaching presence, this may have impacted on the quality and quantity of the cognitive presence made visible by the learners within the online discussions.

Teaching presence has a role in designing, facilitating and directing social and cognitive presence to gain effective educational outcomes. This presence is crucial to sustaining a successful community of inquiry and student learning. Wuensch, Aziz, Ozan, Kishore, and Tabrizi (2008) commented that “[i]nstructor interaction had the largest influence on student satisfaction ... student retention, self-motivation and pass rates” (p. 525). Within this study the instructor actively facilitated online discussions to enhance student understanding and to broaden their perspectives. The instructor was aware of his role in the online space to support the parallel face-to-face teaching. Table 4 illustrates the percentage of posts by the instructor in reference to the three categories of teaching presence.

Presence	Categories	Number of posts	%
Teaching presence	Design and Organisation	16	23%
	Facilitating Discourse	19	28%
	Direct Instruction	34	49%
Total		69	100%

**Table 4:** Frequency of instructor online postings

Of the one hundred and forty-six posts, 47% were made by the instructor. The majority (49%) of these posts were categorized as direct instruction, where the instructor presented further content, posed questions, provided different perspectives and unpacked misconceptions.

The bulk of the designing and organization of the course was completed prior to the students entering in the course, (e.g., establishing a theoretical background to the course design; aligning curriculum, content and assessment; and establishing deadlines). However with 23% of the posts by the instructor coded in this category, it appears that this element of teaching presence was ongoing within the course. Within this category the instructor assisted students in establishing netiquette, contextualizing the information, and provided models for practice.

A similar number of posts (28%) were dedicated to facilitating the online discussions. Here the instructor set the learning climate; drew in, encouraged and reinforced participants and their contributions. The promotion of discussion and engagement between course materials and peers were important elements of this category.

Design, facilitation and direct instruction were all key elements of successful teaching presence. The instructor had a large quantity of online interaction and this active teaching presence impacted on the type and depth of online postings of students. It appeared that the teaching presence within this course, however, did not facilitate discussion to move through the integration and resolution phases of the community of inquiry in the online environment.

## **Implications**

The online environment was a place where students from three different campuses could come together, irrespective of place and time. The online environment provided an opportunity for written communication which promoted precise expression and time for reflective comments to an audience which was larger than what could be provided with the face-to-face tutorial. It also extended the time for discussion. Within a blended course, the online environment should complement the dynamic, spontaneous and fast paced face-to-face communication within small tutorial groups.

Within this example, the online environment was utilized in a face-to-face course by the students to further explore the content and to question/debate key issues. Although there was a high level of teaching presence, students were not required to participate online as part of their assessment. Nor were they required to move through the four phases of cognitive presence as part of the learning design. One of the implications for students was that without an assessment obligation, they could successfully complete a technologically enhanced course without having engaged in online discussions. It appeared that although online participation was not mandatory, undergraduate pre-service teachers did find benefits in extending their discussion time through the use of online discussion.

The key implication from these outcomes is for the role of teaching presence, particularly in the areas of the initial course and assessment design and ongoing online facilitation, where instructors must not only be active in the online forums but should design for and direct discussions to ensure high levels of engagement with the view to improve learning outcomes. Further considerations should be made by instructors in how they might improve the quality and quantity of the student posts. For example, they could model postings which would be considered to demonstrate higher order thinking; they could unpack the features of a quality online post; and they could provide opportunities for students to evaluate the quality of their own posts using set criteria. In the study provided in this paper, perhaps these items were not considered essential because the online contributions were not assessed.

Some questions which follow from this study are: How might the online discussions effectively contribute to the enhancing of face-to-face learning? How might educators of a blended course encourage online participation from a critical mass of students without incentives or assessment based obligations? What motivates students to participate without these incentives or obligations? How does teaching presence impact on cognitive presence? Does increased cognitive presence lead to improved academic results? What other benefits are to be gained by increased cognitive presence?

## Conclusion

Although set in an undergraduate teacher education course which focused on diversity and inclusive responses, the results of the analysis of online discussions were similar to those in post graduate areas in other content areas. It appeared that the content of the course itself had very little impact on the overwhelming number of exploration posts within the forum.

In answering the first research question, undergraduate education students in face-to-face classes use the online environment to further delve into topics and issues in depth. The majority of their posts focus on exploration, “where students explore the issue, both individually and cooperatively through critical reflection and discourse” (Garrison & Arbaugh, 2007, p. 161). In particular they seek to exchange information or gain multiple perspectives by sharing personal narratives, knowledge, literature and ongoing questioning to clarify meaning. The second research question refers to the instructor of an undergraduate face-to-face course. They use the online space to continue all elements of their teaching, with a particular focus on answering student queries and supporting further direct teaching opportunities. The online space supports and extends the face-to-face teaching and learning opportunities.

Online discussion forums can be used in face-to-face courses to extend the time and place for dialogue as a means of developing deep knowledge and high order thinking. The potential for transformative learning however, cannot be realised without pedagogical planning and support. When utilizing online learning in face-to-face courses, educators need to rethink their expectations; restructure the learning activities and re-establish their teaching presence to support learners and increase the effectiveness of online discussions within a community of inquiry. Educators should consider the purposeful role of online environments within a course which is primarily face-to-face.

The aim of the community of inquiry is to “shift from assimilating information to constructing meaning and confirming understanding” (Garrison & Kanuka, 2004, p. 98). However, within an online environment, our judgements can be made only on the nature and quality of the thinking made visible within the learners’ online postings. Students may well be constructing meaning and understandings, yet may not be making their deep personal learning visible through their public posts.

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