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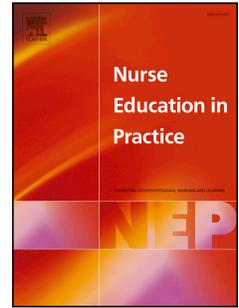
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**THE APPLICABILITY OF COMMUNITY OF INQUIRY
FRAMEWORK TO ONLINE NURSING EDUCATION: A
CROSS-SECTIONAL STUDY**

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ABSTRACT

Abstract

The Community of Inquiry (CoI) framework has the potential to contribute to online education by addressing the nexus of pedagogy, technology, and learners' needs. However, there has been limited investigation of the application of CoI to Australian online tertiary education, with the awareness of CoI amongst Australian nurse educators being unknown. This paper reports on a project which used an online survey to investigate the level of awareness of the CoI framework and its applicability to the design of online and blended courses in Australian higher education nursing schools.

Most respondents ranked the core concepts of the CoI framework as applicable for nursing education, but only 20% of the participants were familiar with the CoI framework before they participated in the survey. While nearly 90% of the participants viewed instructional design and a theoretical framework as essential for building an online course, 70% of respondents indicated that they did not use an explicit theoretical framework to guide the design or the evaluation of their nursing teaching and learning. These results provide the impetus for further investigation of factors influencing the development of online nurse education including the specific consideration of CoI frameworks.

Keywords:

- Community of Inquiry applicability
- Online nursing education
- Theoretical framework
- Community of Inquiry awareness

1 Introduction/Background

The adoption of e-learning may be outpacing research to the extent that technological changes and their implementation are preceding our understanding of how e-learning can support a high-quality educational experience (Garrison and Anderson, 2003). According to Garrison (2011), there is a lack of rigorous research providing evidence to guide e-learning in higher education. Norton and Cherastidtham (2014) agree with Garrison & Anderson's (2003) assessment of the rapid adoption of e-learning, noting that it is often part of a blended learning approach. In Australia, most, if not all, universities provide educators with a learning management system (LMS) to deliver courses. These LMS (e.g., Moodle, Blackboard) provide an online platform for students by using an interface that makes it easy to default to didactic teaching and learning. For example, the commonly used components of LMS are modules, books, folders, and pages. While discussion forums and video conferencing are very common in online courses, LMS also include a range of more interactive features and advanced functions such as customized learning pathways, collaborative content, peer interaction and assessment workshops, file sharing, real-time messaging, and wiki forums. However, according to Christie and Jurado (2009), these interactive features are not widely used by the course designers. Shea and Bidjerano (2009b) report that designers of online courses and educational providers are often confused about how to integrate new technologies into online learning environments in ways that will enrich student learning. Lack of time (Button et al., 2014) may be a factor because nurse educators often need to prepare courses on very short timelines and therefore resort to basic LMS functionality rather than trying more complex interactive learning tools and approaches. Of key importance is that a suitable pedagogy needs to underpin online course design so that student learning is optimised when online technologies are used. The CoI framework may provide such a pedagogy. The purpose of this research project was to investigate the educational providers' and course designers' views on the applicability of the concepts of the Community of Inquiry framework to the design of online nursing education courses in Australian universities.

1.1 The Community of Inquiry (CoI) framework

The Community of Inquiry (CoI) framework originated in the work of Dewey (1938), Peirce (1955), and Lipman (2003). Garrison et al. (2000) broadened and adapted the CoI framework for e-learning education by viewing it through the lens of social, cognitive, and teaching presences. According to the original developers of

the Community of Inquiry framework, social presence in online course means: “The ability of learners to project themselves socially and emotionally, thereby being perceived as 'real people' in mediated communication” (Garrison et al., 2000, p.90). Where the cognitive presence in an online course means “The extent to which learners are able to construct and confirm meaning through sustained reflection and discourse” (Garrison et al., 2000, p.89). The last but not the least presence is the teaching presence defined as “the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (Anderson et al., 2001, p.5).

The CoI model assumes that learning occurs within the community through the interaction of these three core elements. This adaptation of the CoI framework closes the gap between pedagogy, technology, and learners' needs at a tertiary level (Campbell and Cleveland-Innes, 2005; Garrison et al., 2004; Garrison et al., 2000; Jackson et al., 2013; Shea and Bidjerano, 2009b; Swan et al., 2008). In the following, the term *online learning* will be used to refer to e-learning that is conducted online or by blended learning, and the term *CoI* will refer to the adapted model of CoI developed by Garrison et al. (2000).

The online CoI framework is a collaborative constructivist model of teaching and learning (Swan et al., 2009) consisting of three intersecting presences – social, cognitive, and teaching (see Figure 1 below). According to (Swan et al., 2009) the collaborative constructivist approach to learning favours collaboration and engagement, and the online CoI framework explicitly embraces these elements. Therefore, the online CoI model is potentially relevant to the application of emerging interactive e-learning technologies, particularly as one of its major strengths is its focus on how students learn through interaction (Hoskins, 2012). The following discussion describes the research regarding CoI as it relates to online education.

Figure 1: Community of Inquiry framework (Garrison et al., 2000)

1.2 Community of Inquiry research in online education and its implications

Since CoI was first applied to e-learning by Garrison et al. (2000), it has been extensively researched and refined across multiple disciplines, and tools for assessing CoI have also been developed (Arbaugh et al., 2008). There is increased interest in the CoI framework generally (Anagnostopoulos et al., 2005; Arnold and Ducate, 2006; Shea, 2006). Effective promotion of learning using CoI has been reported in disciplines such as business

(Chen et al., 2017), foreign languages (Arnold and Ducate, 2006), and information systems (Heckman and Annabi, 2005). Empirical evidence shows that the CoI framework has a positive impact on the students' satisfaction, higher-order learning, and retention rates when online courses are developed when consideration is given to the social, cognitive, and teaching presences (Akyol and Garrison, 2011; Boston et al., 2009; Hoskins, 2012). This work is not complete because, in a review of the literature, Garrison and Arbaugh (2007) felt that more collaboration would be fruitful between those familiar with the CoI framework and researchers from other disciplines with interest in online education.

1.3 Community of Inquiry research in nursing and health sciences

While the CoI framework has been found to be effective in promoting learning in a range of disciplines, there has been limited research into the CoI framework related to education in nursing and the health sciences (Mills et al., 2016; Phillips et al., 2013). For example, professional practice in nursing and the health sciences requires advanced communication skills (Lewis et al., 2012). Concerns exist that the distancing and impersonal nature of poorly implemented e-learning may not assist students to develop these skills. Because the CoI framework emphasises interactive learning and communication, its application to e-learning may ameliorate some of these concerns.

Given the limited research addressing CoI and health discipline education the potential of the CoI framework to enrich online nurse education needs to be investigated. The research project reported here begins to address this need.

2 Research methods

This project will explore the following questions:

1. What is the awareness and knowledge of Australian nursing educators about the CoI framework?
2. What is the participants' attitudes on the applicability of the CoI framework to online nurse education courses?

An online survey was considered the most efficient way of exploring these issues.

2.1 Survey design

A review of the literature was carried out on the applicability and awareness of the CoI framework in nursing education. This review examined Scopus, Proquest, CINHALL and Web of science databases with keywords including: community of inquiry, online, blended, e-learning, evaluation, design, nurse, knowledge and awareness. The literature review informed the development of the survey tool which was divided into three sections: 1) demographic information, 2) the applicability of CoI presences, and 3) awareness and knowledge of CoI.

The first section of the survey requested demographic data including academic years of experience, the participants' involvement in course design, their preferred and current mode of teaching, their current role, and the topic content they usually taught. Participants were also asked about their institutional support for online learning and the use of theoretical frameworks in the design and evaluation of online courses.

The second section of the survey asked participants for their opinions about the applicability of the three core elements of the CoI framework (the social, cognitive, and teaching presences). These questions were adapted from the original CoI framework survey tool designed by Arbaugh et al. (2008). The Arbaugh et al. (2008) survey was designed to investigate students' perceptions of cognitive, teaching, and social presence in online courses and to explore the interrelationships among the three presences. The adapted survey tool designed for this project was intended to investigate educators' perceptions, rather than student perceptions, of the applicability of cognitive, teaching, and social presences in online courses. Face validity of the tool was established via a panel of expert reviewers who have extensive experience of course design and topic coordination in an Australian school of nursing. The established face validity was deemed adequate given the aims of the research.

The three presences of the CoI framework were defined for participants before they were asked to rate how components of each presence applied to online nursing education. Participants were not provided with background information about the overall CoI framework -- this strategy was intended to reduce any influence on the responses about the value of CoI itself. Participants were asked to rate the applicability of each presence to online education. Each question included an optional comment box for further elaboration of the participants' answers if they wished.

The final section of the survey investigated participants' prior familiarity with the CoI framework. This section asked the participants to describe the CoI framework in their own words and indicate whether they used it to design and evaluate their courses. If the participants were not familiar with CoI, branch logic was used to shorten the survey. Evans and Mathur (2005) described the branch logic as a strength where the participants reply only to the questions that apply specifically to them.

2.2 Selection of respondents

Survey respondents were selected using a purposive sample by using the *Commonwealth Register of Institutions and Courses for Overseas Students (CRICOS)* (Australian Government, 2016). Because the CRICOS database is a comprehensive list of all courses in Australia provided to international students, it was convenient to use it to identify higher education providers who offer a bachelor degree in nursing in Australia. Of the 34 identified universities, 31 schools of nursing had academic staff email addresses available on their websites. The publicly available email addresses of all nursing educators were collected. This process yielded 1,201 email addresses. An email was sent to each of these academic staff introducing the research project and the objectives of the study. The data was collected using the online survey tool SurveyMonkey® and an online link was provided in the email invitation for respondents to access the survey. A reminder email was sent four weeks after the initial email. From the 1,201 emails sent to the Australian nursing educators, 138 completed surveys were received, giving a response rate of 11.5%.

2.3 Ethical considerations

Participants were informed that the completion of the survey would be considered as consent to participate in the study. No identifying information was sought from participants. The research project was approved by the first author University's *Social and Behavioural Research Ethics Committee*.

2.4 Data analysis

The data was analysed using descriptive statistics for multiple choice questions. The open-ended qualitative responses were descriptively coded and the central themes grouped into categories using community of inquiry framework as a lens to guide the coding. The mean score, standard deviation, aggregated mean score, and

pooled standard deviation of the Likert scale responses was analysed and ranked in the order of perceived importance to the participants (Cohen, 1988).

3 Results

3.1 Demographic data and teaching activities.

90% of respondents were involved in curriculum design with more than 48% having more than six years' curriculum design experience. A summary of the demographic data and teaching activities of respondents is presented in Table 1.

Table 1: Demographic data and teaching activities summary

3.2 Use of a theoretical framework for educational design

90% of the participants indicated instructional design and frameworks are essential to building an online course by rating this as somewhat significant or strongly significant. However, 70% of these respondents also indicated that they do not use an explicit theoretical framework to guide the design or evaluation of nursing teaching and learning. Furthermore, 42% of the participants agreed that their institutions have no theoretical framework to design and evaluate online courses.

3.3 Teaching mode

The participants were asked to rank the suitability of teaching modes for designing nursing education curriculum. Blended learning was ranked as the most suitable teaching mode by 90% of the participants. 70% of participants disagreed with the statement that online or web-based communication is a poor medium for educational communities.

3.4 Institutional support

Participants reported varying institutional support for online learning with nearly 46% agreeing that their institution offers the necessary support. 37% rated their institutional support as insufficient.

3.5 Applicability of the Community of Inquiry framework

3.5.1 Social Presence (SP)

Figure 2 below summarises the answers of the participants to the 'social presence' questions. 85% of participants reported that creating social presence in an online course was dependent upon the learner being able to create a sense of their identity. According to the participants, the learner must show 'willingness' to 'interact' and 'engage' to show their identity in an online course. Participant (P75) suggested that:

[t]he learner's active engagement with the learning resources and with other participants in the learning community is an essential attribute that helps develop the learner's individual social presence.

Some participants reported that establishing social presence relies on the teacher's ability to initiate and facilitate the creation of the personal identity of the course participants. For example, participant (P 91) stated that:

... it helps a lot if the teacher can project a certain warmth and acceptance online so students feel safe to open up and participate.

70% of the participants thought that social presence in an online course could be best promoted if students feel they own the online space. However, some participants questioned if learners 'owned the space' but instead shared it with the teacher and other students. As participant (P34) stated:

It is not only students who 'own' the space it is a shared learning space - however, teachers do need to be responsive to student's needs.

54% of the participants thought the statement that 'Online or web-based communication is an excellent medium for social interaction' was applicable.

The participants who commented on this statement regarded online communication as an excellent medium for learning only if the design of the course and the facilitator encouraged the learners to do so. Respondent (P26) believed that an educator:

... need[s] to be creative and innovative to create a successful online social community.

On the other hand, some participants, when commenting on the social presence question, expressed concerns about the ability of online learning to develop face-to-face clinical communication skills. For example (P56) stated:

[n]urses need to learn how to interact face-to-face. Students tend to 'hide' behind the online environment in dealing with issues and I'm not convinced they are therefore equipped when they enter the world of clinical practice.

93% of the participants believed that social presence in an online course would only be established if learners have a feeling of safety. Also, according to some participants, feeling safe in an online environment is the responsibility of the course designer or the teacher facilitating the course. In other words, creating the feeling of safety in the online classroom is part of the teaching presence (TP), illustrating the interaction between SP and TP. Participant (P116) said:

This [feeling safe in online environment] comes back to design and also modelling and moderation by staff.

Figure 2: Social Presence Applicability

3.5.2 Cognitive presence (CP)

Figure 3 below summarises the answers of the participants to the 'cognitive presence' questions. (80%) of the participants believed a triggering event is required for CP to work effectively in an online course.

The participants thought that the triggering event should increase 'critical thinking', 'reflection', and 'engagement' in a trusted environment'. One participant (P13) wrote:

[t]his idea [a triggering event] is critical for learning in an engaged online environment. [a] little controversy is good to get the discussion going too.

87% of participants thought that the concept of CP in an online course is created by learners exploring the issue, both individually and cooperatively, through critical reflection and discourse. One participant (P47) commented:

[r]eflection and constructive, non-judgemental feedback on that reflection assists the student to make sense of the 'event'.

84% of the participants agreed that CP in an online course is created by learners constructing meaning from the ideas developed during the exploration phase. However, some participants questioned the design of most online courses, for example, (P70) said :

A well designed course may achieve this but most online courses are not well designed and do not engage learners or learning.

Figure 3: Cognitive Presence Applicability

3.5.3 Teaching Presence (TP)

Figure 4 below illustrates the answers of the participants to the 'teachingpPresence' questions. 88% of participants thought that facilitating discourse by defining and initiating discussion topics and identifying shared personal meaning was necessary to establish teaching presence in an online course.

'Facilitation' was portrayed as an attribute in creating TP, according to (P54):

Online courses work best with tutors being regularly present and providing consistent, relevant and timely pathways, expectations, feedback and interaction.

Aslo (P67) said:

Students need direction and focus to achieve the learning outcomes and be efficient in the time and effort they put into the activities.

83% of the participants thought that TP in an online course is established by the teacher providing direct instructions by focusing the discussion, questioning, giving direct feedback, injecting of new knowledge, and giving technical support. One participant (P8) stated that:

[f]eedback and responses need to be immediate. Delayed feedback is very stressful for students who rely on this feedback to complete an activity that will be assessed. They have set a time and place in their busy lives/schedule and are frustrated if there is lack of feedback or response.

A few participants were concerned about the 'technical support' that they should provide to the learners, feeling it was beyond their scope. For example, for one participant (P118) wrote:

[s]ome technical support from the teacher is appropriate, but it's not really our role. Helping the students seek other supports, such as IT, and having excellent access to this, is essential to preserve a realistic workload.

Figure 4: Teaching Presence Applicability

3.5.4 Overall applicability of Community of Inquiry scores

Error! Reference source not found. below shows the overall mean and pooled standard deviation score for each presence. This result confirms that the nurse educators consider the core concepts of the CoI framework as applicable to nursing education. A mean score of between 4 and 5 indicates a rating of 'somewhat applicable' to 'strongly applicable'.

Table 2: Overall applicability score of the three presences

3.6 Awareness of Community of Inquiry amongst Australian nurse educators

The participants were asked to rate their familiarity with the CoI framework on a Likert scale from 1 (never heard of it) to 5 (extremely familiar) before this survey. Only 27 participants, 21% rated themselves as 'familiar' or 'extremely familiar' with the CoI framework before they had taken this survey. These participants were asked to describe the framework briefly. The answers were thematically analysed and grouped as shown Table 3. Participants not familiar with CoI were not asked to complete this section of the survey.

Table 3: Familiarity with CoI framework

The participants who rated themselves as being 'familiar' to 'extremely familiar' with the CoI framework (N=26) were asked how often they explicitly drew on the CoI framework in designing and evaluating online topics/courses. 42% of them answered that they very often drew on the CoI framework in designing online topics/courses. 31% of the 26 participants thought that they very often drew on the CoI framework in evaluating online topics/courses. 79% of the 28 participants would recommend the CoI framework to a friend or colleague to use in designing and evaluating online courses for nurses.

46% of the 28 participants rated teaching presence as the most important presence in achieving a community of learners in a CoI framework.

It was evident from the answers of the participants in the previous questions on the applicability of CoI core components that achieving better social and cognitive presence in an online environment must start with a good teaching presence.

4 Discussion

The results of this study suggest that nurse educators believe the CoI framework may apply to nurse education in Australia. While explicit awareness of CoI is relatively low amongst nurse educators, the survey respondents value the presences that make up the CoI framework. It also shows that there is an interest in CoI presences even if educators do not think of them in the formal terms of the CoI framework. These findings are important

because they suggest CoI may be valuable to underpin the design of online or blended nurse education and there may be scope to improve knowledge and awareness about CoI.

4.1 The significance of instructional design and institutional support

The majority of respondents suggested that instructional design and a theoretical framework were important for e-learning, but they did not use an explicit instructional design or conceptual framework to inform their e-learning design. The results suggest that educators recognise the need for instructional design or a theoretical framework but were inhibited from being able to implement this. These findings are consistent with the work of Panda and Mishra (2007) who found time, limited technical support, and lack of training and support for instructional design as barriers for e-learning development. Since under half of the participants reported adequate support in their institution for e-learning, there may be a need for improved staff development and education design support for e-learning. These findings illuminate the need for instructional design and a theoretical framework to design online or blended learning for nursing courses. With the emphasis on staff development on CoI framework, it can be used to provide a pedagogical framework not only to design but also to evaluate online courses for nurses.

4.2 Teaching mode

The majority of respondents rated blended learning as the most suitable teaching mode to design nursing education curriculum. Nursing students perceived the blended mode favourably to assist their knowledge and support the psychomotor techniques necessary for the acquisition of clinical skills (Bloomfield and Jones, 2013). The suitability of blended learning to nursing education maybe due to the fact that nursing education needs a combination of hands-on skills-based training at a functional level in addition to self-driven learning (Al-Shorbaji et al., 2015). Given the applicability of CoI to blended learning (Garrison and Vaughan, 2008), and the findings of this study showing wide use of blended learning in nursing, further investigation of CoI in blended nurse education is warranted.

4.3 The applicability of Community of Inquiry

Survey participants strongly supported the value of the teaching, cognitive, and social presence for effective e-learning even though the majority of participants had little explicit prior knowledge of CoI. Since CoI presences were valued by educators it is important to examine each of these presences in turn.

4.3.1 The views of nursing educators on social presence

Social presence can be classified into three broad categories: emotional expression, open communication and group cohesion (Garrison et al., 2000). The majority of the participants strongly agreed that SP was dependent upon the learner being able to create a sense of their personal identity. From the comments, the participants linked between the interactions, engagement, and the facilitation of the teacher with the creation of personal identity. This linking suggests that the presences in the CoI framework are dynamic and interdependent so they collectively contribute to a worthwhile educational experience. This interaction between SP and TP is also illustrated by the views of some participants that feeling safe in an online course is dependent on the design and moderation of the staff. Unsurprisingly, there is a relationship between the SP indicators in an online course and student retention (Boston et al., 2009).

4.3.2 The views of nursing educators on cognitive presence

Cognitive presence is defined in terms of a cycle of practical inquiry where participants move deliberately from understanding the problem or issue through to exploration, integration, and resolution (Garrison, 2016).

According to the participants, the stages of practical inquiry -- namely triggering, exploration, integration, and resolution -- are applicable to nursing education. Some participants commented that triggering events would increase critical thinking, reflection, and engagement in an online course. The participants confirmed the role of the teacher and good design to enable the learners to reach the exploration phase of the cognitive presence. These factors reinforce the importance of the teaching presence thereby providing evidence about how the interaction between the presences are vital to achieve the higher order learning.

4.3.3 The views of nursing educators on the applicability of teaching presence

The teacher in this element commences the process before the course begins by acting as instructional designer and continues during the course by facilitation of the discourse and providing direct instruction (Anderson et al.,

2001). The three attributes of TP were rated as applicable to online nursing education. The qualitative themes produced were 'facilitation role of the teacher', 'focusing discussion', 'giving timely feedback', and 'injecting new knowledge'.

TP works as a binding element of cognitive and social presence. In general, teaching presence has been found to have three distinct roles: instructional design and course organization; facilitation of discourse; and directed instruction (Anderson et al., 2001). It was evident from the participants' answers how TP interact with and affect the other presences. This result is supported by the literature showing the significant effect of TP on SP and CP (Garrison, 2011; Garrison et al., 2010; Shea and Bidjerano, 2009a; Szeto, 2015), and the role of TP, along with CP, in positively affecting student satisfaction (Lee, 2014)

4.3.4 Implications

The applicability of CoI to nurse education is particularly interesting and warrants further investigation. It is apparent that educators rate cognitive, social, and teaching presence all as important. Given governmental and university emphasis on improving student satisfaction and reducing attrition, it is important to acknowledge how CoI has contributed positively to these outcomes in non-health disciplines (Akyol and Garrison, 2011; Boston et al., 2009; Hoskins, 2012). This suggests that a logical progression for future research is to see if CoI leads to improvements in student satisfaction and reduced attrition in nurse education. As a theoretical approach, CoI is particularly valuable in that it provides a framework that can integrate with and guide the use of emerging technologies. For example, TP can be promoted by using videocasts, podcasts, webinars, discussion forum interactions, live chat, or a range of other approaches. Likewise, SP can be facilitated through a range of blended learning approaches including those related to use of social media and inter-professional education. Development of CP can include the construction of authentic assessment items that require critical thinking and collaborative problem solving which is achieved through use of simulation technology. Consequently, CoI can provide a theoretical developmental and evaluation framework that can be linked to key educational outcome measures and incorporate a range of educational interventions. Of utmost importance is that CoI is concerned with how people learn with technology, rather than the technological itself.

4.4 The awareness of Community of Inquiry

The awareness of CoI among participants is limited. Self-reported knowledge of the CoI framework ranged from excellent to minimal knowledge. The advantages of the CoI framework -- according to the study participants -- are the ability of the framework to increase collaboration, engagement, interaction, sharing, and the students' feeling of not being alone in the online environment. On the other hand, participants expressed their concerns about the amount of time and resources needed to implement such a theoretical framework, especially with the low technical support they received as reported in this survey. The participants who were aware of the CoI rated the TP as the most important presence in achieving community of learners in a CoI framework.

5 Limitations

Some methodological limitations need to be taken into account when interpreting the result of this study. It is possible selection bias may have resulted in participants responding who had an interest in online nurse education and the focus of the survey. The response rate was low, which may be problematic, but the literature reports that response rates of between 5%-12% are common in online surveys (Porter and Whitcomb, 2007).

It is important also to acknowledge the limitations of the survey tool which was not validated, even if it was an adaptation of a validated tool. Despite the establishment of the face validity of the tool via a panel of expert reviewers, additional work of this kind would necessitate validation of the tool for more vigorous research.

6 Conclusion

This study has identified the potential applicability of CoI to online nurse education by surveying educators currently teaching in online or blended modes in Australia. Also, this study has shown the perceived importance of instructional design and theoretical framework to build an online courses for nurse educators using blended learning. Since CoI has been shown to improve student satisfaction and decrease attrition in non-health disciplines, the implementation of CoI in nurse education should be investigated more. CoI provides a

comprehensive framework relevant to face-to-face, blended, and online education with the potential to embed numerous technology-linked interventions within a CoI framework. For the CoI framework to be utilised to the maximum, the universities should invest in staff development programs using this framework so they are more familiar with it. The challenge for educators is how to optimise the benefits of this framework and identify the most effective technologies and strategies to build the teaching, social, and cognitive presence.

References

- Akyol, Z., Garrison, R.D., 2011. Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology* 42, 233-250.
- Al-Shorbaji, N., Atun, R., Car, J., Majeed, A., Wheeler, E., 2015. eLearning for undergraduate health professional education: a systematic review informing a radical transformation of health workforce development. World Health Organization 2015, Switzerland.
- Anagnostopoulos, D., Basmadjian, K., Mccrory, R., 2005. The decentered teacher and the construction of social space in the virtual classroom. *The Teachers College Record* 107, 1699-1729.
- Anderson, T., Liam, R., Garrison, D.R., Archer, W., 2001. Assessing teacher presence in a computer conferencing context.
- Arbaugh, B.J., Cleveland-Innes, M., Diaz, S.R., Garrison, R.D., Ice, P., Richardson, J.C., Swan, K.P., 2008. Developing a community of inquiry instrument: Testing a measure of the community of inquiry framework using a multi-institutional sample. *Internet and Higher Education* 11, 4.
- Arnold, N., Ducate, L., 2006. Future foreign language teachers' social and cognitive collaboration in an online environment. *Language Learning & Technology* 10, 42-66.
- Australian Government, D.o.E.a.T., 2016. Commonwealth register of institutions and courses for overseas students (cricos).

- Bloomfield, J.G., Jones, A., 2013. Using e-learning to support clinical skills acquisition: Exploring the experiences and perceptions of graduate first-year pre-registration nursing students — A mixed method study. *Nurse Education Today* 33, 1605-1611.
- Boston, W., Díaz, S.R., Gibson, A.M., Ice, P., Richardson, J., Swan, K., 2009. An exploration of the relationship between indicators of the community of inquiry framework and retention in online programs. *J. Asynchronous Learn. Netw.* 13, 67-83.
- Button, D., Harrington, A., Belan, I., 2014. E-learning & information communication technology (ICT) in nursing education: A review of the literature. *Nurse Education Today* 34, 1311-1323.
- Campbell, P., Cleveland-Innes, M., 2005. Educational presence in the community of inquiry model: The student's viewpoint, 21st Annual conference on distance teaching and learning.
- Chen, B., Zydney, J., Patton, K., 2017. Creating a community of inquiry in large-enrollment online courses: An exploratory study on the effect of protocols within online discussions. *Online Learning* 21.
- Christie, M., Jurado, R.G., 2009. Barriers to innovation in online pedagogy. *European Journal of Engineering Education* 34, 273-279.
- Cohen, J., 1988. *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Earlbaum Associates 2.
- Dewey, J., 1938. *Education and experience*. New York: Macmillan.
- Evans, J.R., Mathur, A., 2005. The value of online surveys. *Internet research* 15, 195-219.
- Garrison, D.R., 2011. *E-learning in the 21st century: A framework for research and practice*. Taylor & Francis.
- Garrison, D.R., 2016. *E-learning in the 21st century: A community of inquiry framework for research and practice*. Routledge.
- Garrison, D.R., Anderson, T., Archer, W., 2010. The first decade of the community of inquiry framework: A retrospective. *The Internet and Higher Education* 13, 5-9.

- Garrison, D.R., Arbaugh, J.B., 2007. Researching the community of inquiry framework: Review, issues, and future directions. *Internet and Higher Education* 10, 157-172.
- Garrison, D.R., Cleveland-Innes, M., Fung, T., 2004. Student role adjustment in online communities of inquiry: Model and instrument validation. *J. Asynchronous Learn. Netw.* 8, 61-74.
- Garrison, R., Anderson, T., 2003. *E-learning in the 21st Century: A Framework for Research and Practice*. Taylor & Francis.
- Garrison, R., Anderson, T., Archer, W., 2000. Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education* 2, 87-105.
- Garrison, R., Vaughan, N., 2008. *Blended learning in higher education: Framework, principles, and guidelines*. John Wiley & Sons.
- Heckman, R., Annabi, H., 2005. A content analytic comparison of learning processes in online and face-to-face case study discussions. *Journal of Computer-Mediated Communication* 10, 00-00.
- Hoskins, B.J., 2012. Connections, engagement, and presence. *Journal of Continuing Higher Education* 60, 51-53.
- Jackson, L.C., Jackson, A.C., Chambers, D., 2013. Establishing an online community of inquiry at the Distance Education Centre, Victoria. *Distance Education* 34, 353-367.
- Lee, S.M., 2014. The relationships between higher order thinking skills, cognitive density, and social presence in online learning. *Internet and Higher Education* 21, 41-52.
- Lewis, R., Strachan, A., Smith, M.M., 2012. Is high fidelity simulation the most effective method for the development of non-technical skills in nursing? A review of the current evidence. *The open nursing journal* 6, 82.
- Lipman, M., 2003. *Thinking in education*, 2nd ed. Cambridge University Press, West Nyack, NY, USA.
- Mills, J., Yates, K., Harrison, H., Woods, C., Chamberlain-Salaun, J., Trueman, S., Hitchins, M., 2016. Using a community of inquiry framework to teach a nursing and midwifery research subject: An evaluative study. *Nurse education today* 43, 34-39.

- Norton, A., Cherastidtham, I., 2014. Mapping Australian higher education, 2014-15, Grattan Institute.
- Panda, S., Mishra, S., 2007. E-learning in a mega open university: Faculty attitude, barriers and motivators. *Educational Media International* 44, 323-338.
- Peirce, C., 1955. In J. Buchler (Ed.), *Philosophical writings of Peirce*. New York: Dover.
- Phillips, D., Forbes, H., Duke, M., 2013. Teaching and learning innovations for postgraduate education in nursing. *Collegian* 20, 145-151.
- Porter, S.R., Whitcomb, M.E., 2007. Mixed-mode contacts in web surveys: Paper is not necessarily better. *Public Opinion Quarterly* 71, 635-648.
- Shea, P., 2006. A study of students' sense of learning community in online environments. *Journal of Asynchronous Learning Networks* 10.
- Shea, P., Bidjerano, T., 2009a. Cognitive presence and online learner engagement: A cluster analysis of the community of inquiry framework. *Journal of Computing in Higher Education* 21, 199-217.
- Shea, P., Bidjerano, T., 2009b. Community of inquiry as a theoretical framework to foster "epistemic engagement" and "cognitive presence" in online education. *Computers & Education* 52, 543-553.
- Swan, K., Garrison, D., Richardson, J.C., 2009. A constructivist approach to online learning: the Community of Inquiry framework. *Information technology and constructivism in higher education: Progressive learning frameworks*. Hershey, PA: IGI Global, 43-57.
- Swan, K., Shea, P., Richardson, J., Ice, P., Garrison, D., Cleveland-Innes, M., Arbaugh, J., 2008. Validating a measurement tool of presence in online communities of inquiry. *E-mentor* 2, 1-12.
- Szeto, E., 2015. Community of Inquiry as an instructional approach: What effects of teaching, social and cognitive presences are there in blended synchronous learning and teaching? *Computers & Education* 81, 191-201.

Participants' characteristics (n=138)	n (%)
> 45 years old	108 (79%)
Level of employment:	
Level A Tutor/ Associate Lecturer	9 (7%)
Level B Lecturer	67 (49%)
Level C Senior Lecturer	38 (28%)
Level D Associate Professor	11 (8%)
Level E Professor	8 (6%)
Level of course they teach (more than one option)	
Bachelor Degrees	105 (82%)
Master Degrees	73 (57%)
Doctorate	42 (33%)
Full time	124 (86%)
Mode of current teaching	
Combination of face-to-face and online	106 (83%)
Percentage of time spent online in the last 12 months : > 30% online	107 (78%)
Involved in curriculum design	122 (90%)
Years of experience working in:	
• Nursing education >6 years	113 (84%)
• Curriculum design >6 years	66 (48%)

Table 1: Demographic data and teaching activities summary

Presence	Overall mean score	Pooled SD score
Social Presence Applicability	4.03	.62
Cognitive Presence Applicability	4.14	.74
Teaching Presence Applicability	4.19	.76

Table 2: Overall applicability score of the three presences

Open ended questions	n	The most important themes
Please write a brief statement describing what the Community of Inquiry framework is.	21	<ol style="list-style-type: none"> 1- Excellent knowledge (38%) 2- Good knowledge (24%) 3- Weak knowledge (19%) 4- No knowledge (10%)
What do you like most about the Community of Inquiry framework?	20	<ol style="list-style-type: none"> 1- Collaboration 2- Engagement 3- Not alone 4- Interaction 5- Achieve goals 6- Sharing
What do you most dislike about the Community of Inquiry framework?	6	<ol style="list-style-type: none"> 1. Not enough time/resources to implement 2. Idealistic framework 3. Hard to engage/motivate the students in the blogs 4. Very high load for teachers

Table 3: Familiarity with CoI framework

Figure 1: Community of Inquiry framework (Garrison et al., 2000)

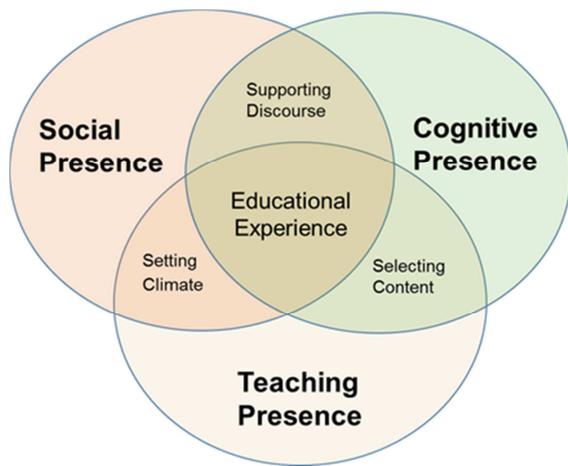


Figure 2: Social Presence Applicability

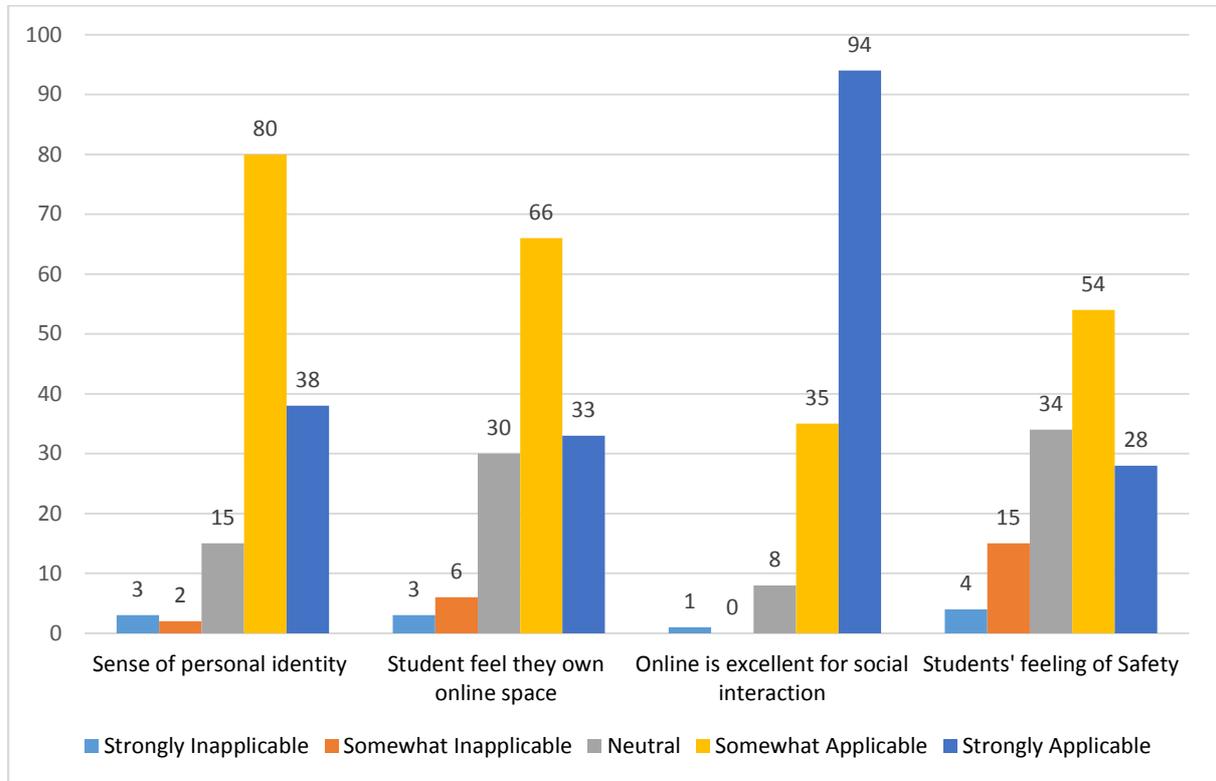


Figure 3: Cognitive Presence Applicability

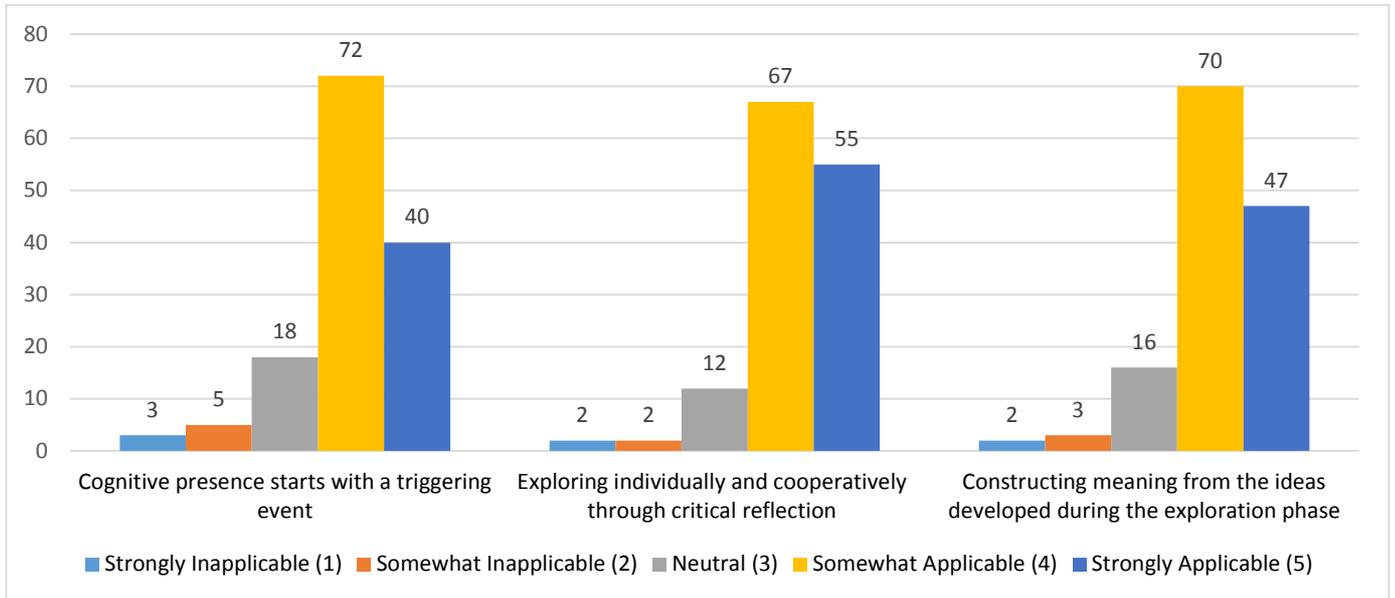
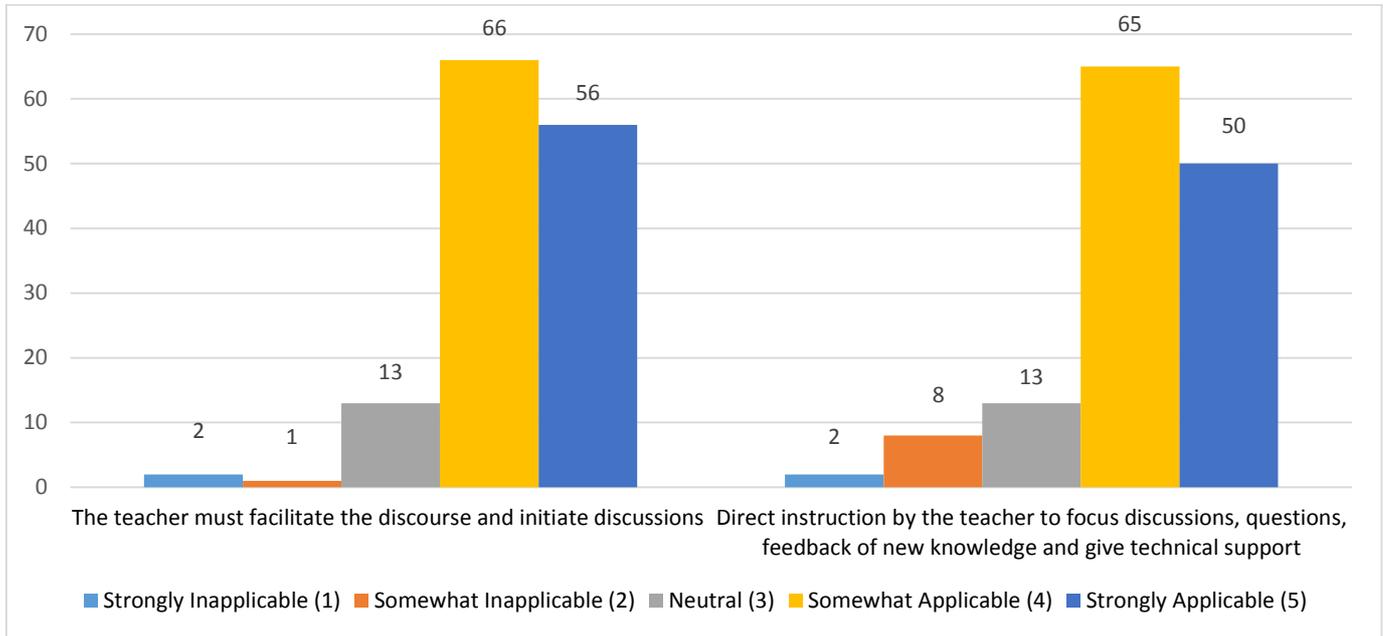


Figure 4: Teaching Presence Applicability



Highlights

- The currently used mode of teaching in online nursing programs is blended learning (83%). Nurse educators also ranked blended learning as the teaching mode best suited to nursing education (90%).
- Ninety percent of survey participants are involved in curriculum design, and 90% of the participants viewed instructional design and use of a guiding framework as significant to building an online course. However, 70% of these respondents indicated that they do not use an explicit theoretical framework to guide the design or evaluation of online nursing teaching and learning.
- The participants ranked the core concepts of the three dimensions of the Community of Inquiry framework (Cognitive Presence, Teaching Presence and Social Presence) as *applicable* to *strongly applicable* for online nursing education.
- Only 20% of the participants are familiar with CoI framework, and of them, 79% are likely to recommend CoI framework to a colleague.

CONFLICT OF INTREST

The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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