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Development of a community of inquiry in online and blended learning contexts

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Abstract

This paper discusses findings of a mixed method research project with the goal to study the development of a community of inquiry in online and blended learning environments. A graduate course delivered online and blended format was the focus of the study. Data was gathered from the Community of Inquiry Survey and transcript analysis of online discussions to explore the developmental differences on each presence (social, teaching and cognitive). The results showed: significant differences on social and cognitive presence between two course formats and higher perceptions of the presences in blended course.

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Keywords: Community of inquiry; online learning; blended learning.

1. Introduction

The field of distance education has changed dramatically in the past ten years. Distance education programs are increasing in number in all aspects of education, including K-12 education, postsecondary instruction, and continuing and professional education programs all over the world. Specifically, online and blended learning are becoming widespread along with the changing needs of society and advances in technology. This situation calls for the need to explore and develop frameworks or models in order to understand the complex nature of teaching and learning in these learning environments. In recent years there is one model that has generated considerable interest and has been widely adopted and studied by researchers [1]. That model is the Community of Inquiry (CoI) framework developed by Garrison, Anderson and Archer [2].

The framework provides order and guidance into the complexities and dynamics of online and blended learning environments. The philosophical premise of the framework is a collaborative constructivist approach to teaching and learning. The framework implies that a worthwhile educational experience is embedded within a community of inquiry that is composed of teachers and students - the key participants in the educational process. The CoI

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framework is comprised of three overlapping elements: social presence, cognitive presence and teaching presence. In a community of inquiry, deep learning occurs through the interaction of these three presences.

Social presence has been defined recently by Garrison [3] as “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.” Social presence is an important antecedent to collaboration and critical discourse by supporting cognitive objectives through its ability to instigate, sustain, and support critical thinking in a community of learners [4]. There are three categories of social presence: affective expression, open communication and group cohesion. Garrison, Anderson and Archer [5] describe cognitive presence as “the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry” (p. 11). Cognitive presence is operationally defined through the Practical Inquiry model that consists of four phases: triggering event, exploration, integration, and resolution. Teaching presence is defined as “the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” [6, p. 5]. By using the term ‘teaching’ instead of ‘teacher’, the possibility of distributing the responsibilities and roles of a teacher among participants is emphasized.

Taking the Community of Inquiry Framework as a theoretical construct, this study investigated the development of teaching, social and cognitive presence in two learning environments: online and blended course.

2. Methodology

This study applied a mixed methodology approach which provides depth and breadth to the study not possible using either quantitative or qualitative data exclusively [7,8]. The research context of this study was a graduate course on the topic of blended learning. The course was delivered online in the fall term of 2007 and in a blended format in the winter term of 2008. Both methods of delivery were the focus of this study. The course was designed and organized on the basis of the CoI framework. That is, learning activities, strategies and assessment techniques were all developed to reflect social, cognitive and teaching presence. The major assignments were article critiques and peer reviews, weekly online discussions (nine weeks of discussion in each course), and prototype course redesign projects. In the first online discussion, the instructor modeled how to facilitate the discussion in an effective way. In order to distribute teaching presence among students and teacher, students were responsible to facilitate and direct the online discussions in each of the remaining weeks. The participants of the study were 15 students in the online course and 12 students in the blended course. Only one student in the online course did not respond to the consent form to participate in the study.

Transcript analysis was applied in order to code and explore posting patterns of social presence, teaching presence and cognitive presence based on category indicators defined in the CoI framework [4]. The unit of analysis was the each single message posted by students. Two researchers applied the transcript analysis after training and pilot coding two discussions. The inter-rater reliability of the coders was .75 before they started actual coding. The researchers applied a negotiated coding approach in which the researchers coded transcripts and then actively discussed their respective codes to arrive at a final assessment of the code [9]. A CoI survey instrument was also administered at the end of the each semester to explore students’ perceptions of each presence in the community of inquiry. The CoI Survey was developed and validated by Swan and colleagues [10]. Cronbach’s Alpha was 0.94 for teaching presence, 0.91 for social presence, and 0.95 for cognitive presence. The CoI Survey included teaching presence perception (13 items), social presence perception (9 items) and cognitive presence perception (12 items).

3. Results

Social presence was analyzed in the transcripts by coding for affective expression, open communication and group cohesion. Cognitive presence was analyzed in the transcripts by coding for the triggering event, exploration, integration and resolution. Teaching presence was coded for design and organization, facilitating discourse, and direct instruction. Table 1 illustrates the comparison of the coding results for categories of each presence in three week periods between the online and blended courses. As seen in Table 1, the main differences between the two courses in terms of social presence are: (i) affective expression was found more in the online course compared to the blended course and (ii) group cohesion was found more in the blended course. With regard to the cognitive

presence, the integration phase was the most frequently coded category of messages posted by students in both courses. However, integration was found more frequently in the blended course whereas exploration was found less in blended course. In terms of teaching presence, virtually none of the messages were coded as design and organization in both courses and online course discussions included more facilitating discourse and direct instruction indicators compared to the blended course discussions.

Table 1 Coding results for CoI Presences in online and blended course

		First 3 weeks of Discussion		Second 3 weeks of discussion		Last 3 weeks of discussion		TOTAL	
		Online	Blended	Online	Blended	Online	Blended	Online	Blended
Social Presence	Affective Communication	34 %	17 %	39 %	14 %	25 %	6 %	33 %	12 %
	Open Communication	58 %	36 %	43 %	49 %	43 %	38 %	48 %	41 %
	Group Cohesion	7 %	23 %	16 %	22 %	20 %	28 %	14 %	24 %
	No category detected	0 %	25 %	4 %	16 %	12 %	29 %	5 %	23 %
Teaching Presence	Design and Organization	1 %	0 %	1 %	0 %	0 %	0 %	1 %	0 %
	Facilitating Discourse	28 %	18 %	23 %	23 %	25 %	23 %	25 %	21 %
	Direct Instruction	19 %	19 %	33 %	24 %	38 %	21 %	30 %	21 %
	No category detected	53 %	63 %	44 %	53 %	38 %	56 %	45 %	57 %
Cognitive Presence	Triggering Event	15 %	2 %	7 %	5 %	8 %	5 %	10 %	4 %
	Exploration	18 %	16 %	30 %	16 %	27 %	10 %	25 %	14 %
	Integration	47 %	55 %	45 %	43 %	52 %	57 %	48 %	52 %
	Resolution	7 %	6 %	10 %	8 %	6 %	4 %	7 %	6 %
	No category detected	14 %	21 %	9 %	28 %	8 %	23 %	10 %	24 %

Further analysis was conducted in order to explore whether there were any statistical differences between the online and blended courses in terms of social presence, teaching presence and cognitive presence categories by using independent samples t-test. For Social Presence, the analysis indicated that affective expression ($p=.001$) and group cohesion ($p=.001$) categories of social presence were significantly different when compared, whereas the level of open communication was found to be similar. Affective communication was found to be more frequent in the online course ($M=36.24$) than the blended course ($M=15.69$), whereas group cohesion was more frequent in the blended course ($M=26.61$) compared to the online course ($M=10.89$). For Cognitive Presence, the analysis indicated that the exploration ($p=.004$) and integration ($p=.004$) categories were found to be significantly different across the course. As mean values for these categories indicated, the level of exploration decreased while the level of integration increased in the blended course. The analysis did not indicate a significant difference on the categories of teaching presence, although the comparison of facilitation and direct instruction categories showed that online

course discussions included more facilitating discourse and direct instruction indicators compared to the blended course discussions. Due to the small sample size, Mann-Whitney U test was also conducted. The results of the test were consistent with the t test results that there were significant differences for the affective communication and group cohesion category of social presence, integration and exploration category of cognitive presents and there was not any significant difference between two courses in terms of teaching presence categories.

The descriptive analysis of CoI Survey Results indicated that students had high perceptions of each presence in both courses. However, students in the blended course had slightly higher perceptions compared to the students in the online course. Independent samples t test and Mann-Whitney U test was conducted to explore whether the differences on perceptions were statistically significant according to the course design (i.e., online or blended). The results of both tests indicated that there was a statistically significant difference on the perceptions of teaching presence.

4. Discussion and Conclusion

This study aimed to explore the development of a community of inquiry in two different learning environments. First of all, it should be noted that the course design was successful in enabling the development of each presence in both courses. However, the study found developmental differences on CoI presences regarding the course format. In terms of social presence, two categories – affective communication and group cohesion- were found different. The higher level of affective communication such as expression of emotions, use of humors and self disclosure in online course might be due to the need to establish climate in online course. On the other hand, face-to-face component of blended course might have increased the group cohesion and decreased the need for affective communication on online component.

The second difference was on cognitive presence categories. Overall, contrary to previous studies which found exploration to be the most frequently coded practical inquiry phase [11, 12, 13, 14, 15], transcript analysis in this study found that integration was the most frequently coded phase in both courses. However, the integration phase was found significantly higher in blended course compared to online course whereas exploration phase was found significantly higher in online course than in blended course. The explanation for these differences could be that students in blended course started discussion in face-to-face meetings, therefore triggering event and exploration mostly occurred in face-to-face meetings. Online part could be more reflective, more rigorous, and easier to keep track of ideas for the students in blended course. At the same time, the resolution phase had the least activity in both courses. This might be because the resolution thoughts were directed to each of the student's individual course redesign project.

The study did not find a difference on teaching presence categories between two courses. However, although not statistically significant, there were fewer direct instruction responses in the blended course. Direct instruction occurred mostly when students shared and injected knowledge from course readings and other scientific resources. Therefore, the reason for lower level of these responses in blended course might be that direct instruction was split between online and face-to-face parts of blended course; the students could share resources and inject knowledge during face-to-face meetings.

Finally, the survey analysis yielded higher perceptions of each presence in both courses. However, the students in blended courses had slightly higher perceptions of each presence. The only significant difference was found on teaching presence. This finding could be anticipated since the students in blended course had chance to interact with the course instructor in face-to-face meetings.

The main emphasis of community of inquiry framework is to create an effective community that enhance and support learning. Building a learning community is valuable as it serves social needs as well as enhancing student satisfaction and learning through community involvement [16]. A recent study has emphasized that epistemic engagement in which the students are collaborative knowledge builders is well articulated and extended through the community of inquiry framework [17]. This study illuminated how community of inquiry developed in two different learning environments. Due to the small sample size, the findings of this study can not be generalized. However, taking into consideration the contextual differences and contingencies, instructional designers can apply the CoI framework and approach to designing effective online and blended environments for effective teaching and learning.

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