CROSS-INSTITUTION ONLINE PROBLEM BASED LEARNING IN CHINESE MEDICINE EDUCATION

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Abstract

New education technology drives the pedagogical changes nowadays. Teaching and learning collaborations can now be extended beyond institutional boundaries. This study reports a new attempt of cross-institution collaboration in co-teaching a Chinese Medicine course. A Cross-institution Online Problem-based Learning (COPBL) is designed and implemented by the University of Hong Kong (HKU) and Chengdu University of Traditional Chinese Medicine (CDUTCM). There are 25 students from HKU and 24 students from CDUTCM who have participated in the COPBL. It is a supplementary component to courses and a seven-step approach has been adopted. Students work individually and collaboratively with floating-facilitators. The classes are blended with face-to-face and online components. As an initial step to understand the effectiveness of COPBL, this study specifically focuses on students' use of the discussion forum, which is a key online component in COPBL. There are 91.8% of students who have viewed the discussion forum in total, 839 of view counts in all discussion forums. There are 63 replies recorded in all of the discussion forums. The replies could be identified into following categories, comments (33%), comments and questions (27%), responses (37%), and others (3%).This study has demonstrated that problem-based learning can be conducted in a blended form with traditional classroom teaching methods and well-designed online components. The COPBL offers new possibilities in redesigning pedagogy with new education technology. It could bring our education into a new era surrounded with new learning experiences.

Keywords: Chinese Medicine Education, Cross-institution Collaboration, Instructional Design, Online Problem-based Learning.

1. Introduction

PBL is an instructional method that allows students to learn from the process of working toward the understanding or resolution of a problem (Barrows & Tamblyn, 1980). The seven-step approach in PBL includes clarifying concepts, defining the problem, analyzing the problem, systematic classification, formulating learning objectives and self-study and discussion (van Til & van der Heijden, 2000). PBL aims at helping students develop flexible knowledge, effective problem-solving skills, self-directed learning skills, effective collaboration skills and intrinsic motivation (Hmelo-Silver, 2004).

PBL has been adopted in the Faculty of Medicine at the University of Hong Kong (HKU) since 1997. Both the Faculty of Dentistry and the Faculty of Education at the University have shown their success in designing and implementing online PBL with the Moodle (Ng et al., 2014). Studies have found that students in an online PBL environment, rich with pre-selected video and knowledge resources, accessed resources fairly frequently and benefited from them (Jeong & Hmelo-Silver, 2010). It is also evident that online PBL provides increased flexibility for students and enhances their ability in processing learning materials (Valaitis et al., 2005).

Computer-supported collaborative learning has shown its benefits towards learning over traditional way. It is possible to archive precise learning outcomes and support during collaboration (Cone, 2008). The engagement in the discussion will also be promoted in computer-supported collaborative learning (Oliverira, Tinoca & Pereira, 2011).

The School of Chinese Medicine at HKU has also been successful in adopting the Moodle and multimedia in teaching and learning. We move further to organize an online PBL in a cross-institutional level with Chengdu University of Traditional Chinese Medicine (CDUTCM). By designing innovative applications of the Moodle, the possibility for organizing problem-based learning with information technology and cultural exposure could be explored and evaluated.

2.Learning Design

Course description

Cross-institutional Online Problem-based Learning (COPBL) is one type of PBL involving the use of online learning environment and the collaboration of students from different institutions. In this project, the PBL is a supplementary component to the course. Students work individually and collaboratively with floating-facilitators. The classes are blended with face-to-face and online components.

3.Target

Twenty-five students enrolled in BCHM2005 Cultivation and Health Care of Chinese Medicine (2015/2016) from the School of Chinese Medicine, HKU; and twenty-four students randomly selected from Chinese Medicine Prescription (2015/2016) from the Chengdu University of Traditional Chinese Medicine are recruited in the project.

Pedagogical Approach (Problem-based learning)

The whole process was monitored and delivered with definite timeframe. See Table 1.

Table1: Design of the COPBL Activities (Face-to-Face and Online)

Cross-institutional Online Problem-based Learning			
HKU Students	CDUTCM Students	Tutor	Modality
Students from HKU & CDUTCM form small groups within their institutions			
Presenting Case Scenario in Class Students study the case scenario		Distributing case	Individual Face to face
Preliminary Discussion in Class Clarifying concepts Defining the problem Analyzing problem Systematic classification Formulating learning objectives		Facilitating discussion	Group Face to face
Self-study 6. Self-study		Providing assistance	Individual N/A
Students create their multimedia presentation			

Reporting in Moodle Students upload and watch presentations from both institutions in the Moodle 7. Discussion "Forum" in the Moodle will be set up for each presentation. Each group discuss at least 2 presentations (1 from HKU; 1 from CUTCM) by posting replies in respective "Forum". Creators of the presentation response the replies in "Forum".	Facilitating upload Discussion	Group Online

Each small group was composed of 6-7 students. There were 4 groups from HKU and 4 groups from CDUTCM. The seven-step approach in PBL was achieved in two meetings, one face-to-face meeting followed by one online meeting.

Students attended the face-to-face meeting in their own institution with classmates from the same institution. During the face-to-face meeting, a case scenario was presented to students. They were required to clarify concepts, define the problem(s), analyze the problem(s), systematic classification and formulate learning objectives.
After the face-to-face meeting, students self-studied relevant materials from different resources including libraries, journal database and other web resources.

Students then attended the online meeting in the Moodle with classmates from both institutions. They presented their findings in group and posted it on respective discussion forum in the Moodle. Students from both institutions started online discussion by viewing, commenting, questioning others' work and responding to questions in the Moodle asynchronously. Students were able to share opinions and exchange ideas without limitation of time and distance in the Moodle during discussion. They were required to discuss topics with other groups from both institutions in the forum.

The whole learning process, preliminary discussion and reporting were assessed with assessment rubrics adopted in School of Chinese Medicine, considering the following criteria including participation, communication, preparation, critical thinking and group skills. The result was counted as part of the continuous assessment in the course as usual.
There are two key features that distinguish this PBL design from others in existence. Firstly, students experience two modes of learning, face-to-face and online. This blended mode of learning provides students with richer experience, higher flexibility, and more interactivity. Secondly, it situates HKU students in a collaborative platform with students in CDUTCM. Students can view the problem-solving and presentations made at the other side and exchange ideas. This is a valuable learning experience for students from both institutions and the intention is in line with the course learning outcomes.

4.Results

There are 25 students from HKU and 24 students from CDUTCM, 49 in total, participated in the COPBL. The performance of discussion (the seventh step in PBL), online component, has been recorded in the Moodle. These data provide an initial understanding of the effectiveness of the COPBL. The following sections present the analysis results.

The percentage of students viewed discussion forums

There are 91.8% of students who have viewed the discussion forum in total. 26.5% of students have viewed discussion forums from all groups. Overall, 53.1% of students have viewed discussion forums from more than half of the groups. See Figure 1.
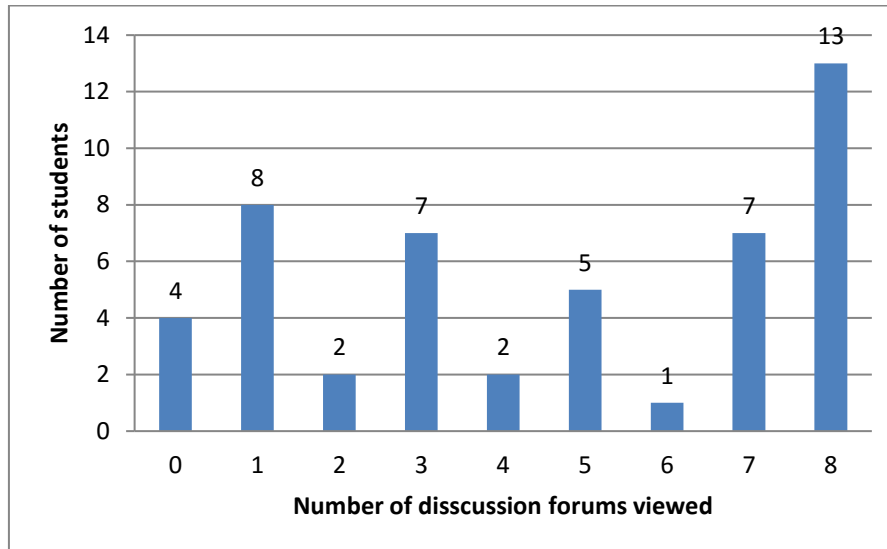

Figure 1: The Number of Students that have viewed Discussion Forums

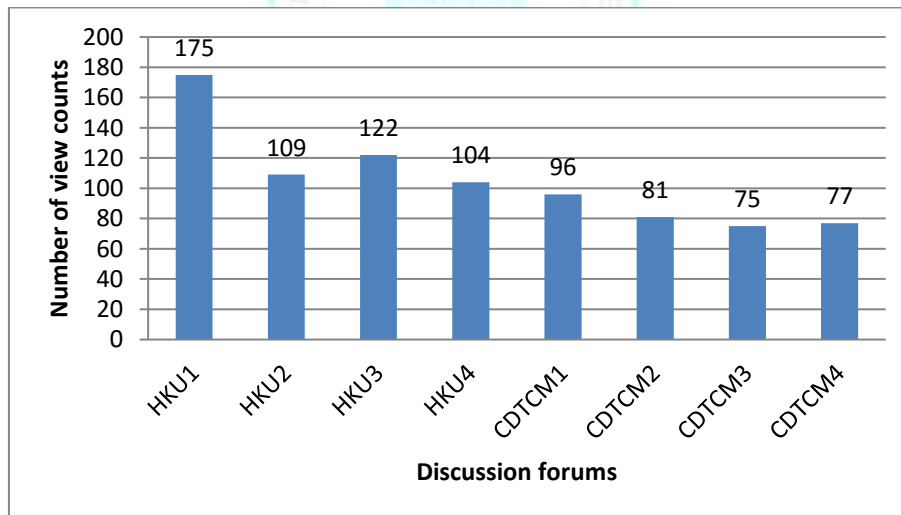**The number of view counts in discussion forums**

Figure 2: The Number of View Counts in Discussion Forums

There are 839 of view counts in all discussion forums. The highest number of view counts in single discussion forum is 175. The lowest number is 75. The four HKU groups are denoted by HKU1, HKU2 ...HKU4 and the same applies to the four CDTCM groups. See Figure 2.

The number of replies in discussion forums

There are 63 replies recorded in all of the discussion forums. The highest number of replies in single discussion forum is 21. The lowest number is 3. See Figure 3.
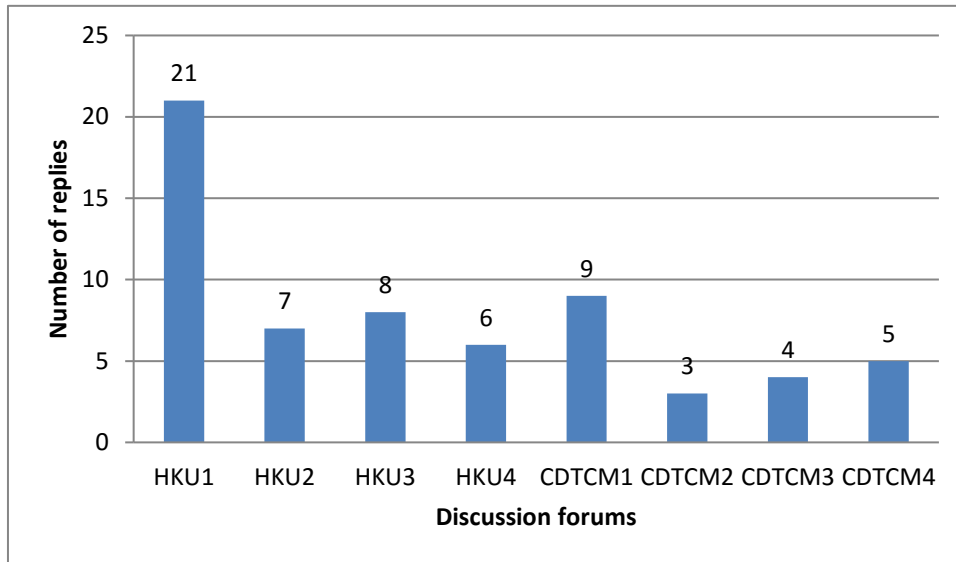

Figure 3: The Number of Replies in Discussion Forums

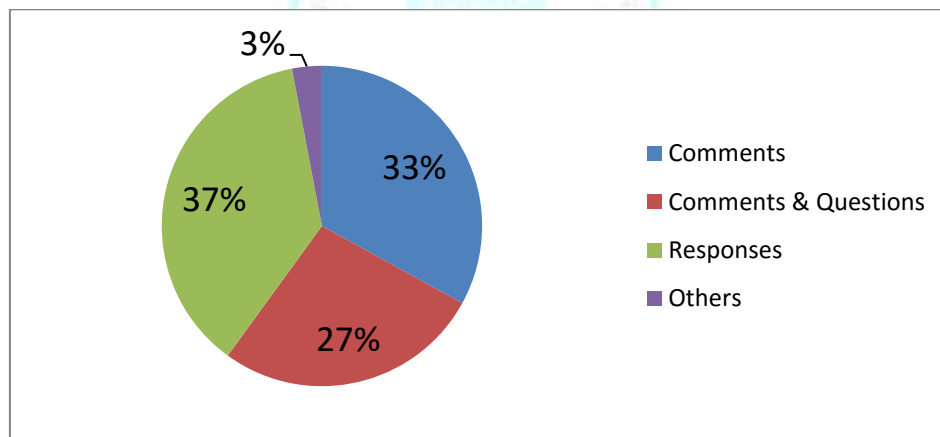## The type of replies in the discussion forums

Figure 4: The Type of Replies in Discussion Forums

The replies could be identified into following categories, comments (33%), comments & questions (27%), answers (37%) and others (3%). See Figure 4.

5.Discussion

Theories underlying the Design

Zone of proximal development
Theory of zone of proximal development (ZPD) was proposed by Lev Vygotsky (1978). There are three zones including where the student cannot perform, the student can perform with

help and the student can perform individually. In the Cross-institution Online Problem-based Learning, 2 layers of learning community are formed. First, students work in groups to explore problems from the case scenario. They will be able to discuss and identify new learning issues based on their previous knowledge. They will construct their knowledge based on the identified learning issues. Second, they will present their knowledge in the Moodle. The knowledge interflow in the Moodle allows the formation of a larger and multi-cultural learning community. Students co-construct their knowledge in the community. They also provide and receive support from other students in it.

From the result, we can see the view counts in discussion forumsare high. Students engaged in their learning actively in the online platform. Also, scaffolding could be achieved with continuous discussion including giving comments, forming further questions and answering questions with new information. The community dynamics is obviously beneficial to students learning

Contextualized learning

"Activity cannot be understood or analyzed outside the context in which it occurs" (Jonassen, 1999). Students often find what they have learnt in classroom is irrelevant or inapplicable to the real-world problems (Rosenbaum & Axelson, 2013). It is because their learning is not constructed within a specific context. As a result, students might not be able to make sense and make use of the knowledge. In this learning design, a scenario which is related to clinical practice is presented to students.

Although students still need to spend time learning in the classroom, they are also given the chance of learning through solving real-world problems. The gap between classroom and clinical practice is bridged because the knowledge constructed is rooted in the same context (James, Al Khaja & Sequeira, 2015.)

Collaborative learning

Students are required to work in groups to complete the learning activities. Of course, students might have different perceptions or interpretations to the contents, subsequently different ideas. They might have discussions, even debates, to share their ideas, accept ideas, reject ideas and even propose new hypothesis. They sometimes go back to the learning resources again or find new resources. The process will be repeated until the ideas are accepted by the group instead of individual.

Conclusion

Although we can see various attempts in applying technology in education, there is always an important question to ask. Is it effective towards teaching and learning? Focusing on expensive hardware or a closed system will often decrease the accessibility of the technology (Abachi & Muhammad, 2014). What needs to be promoted is an approach that integrates technology with educational pedagogy for the actual purpose of enhancing student learning.

In our design, a web-based learning management system, the Moodle, is selected to suit different physical learning environments. It is convenient to use for students at both institutions. Along with the use of Moodle, the pedagogy design is also adapted in order to facilitate interactions and mutual learning between students from different institutions located in two different regions. The current study has analyzed the use of the discussion forum. In the next stage, interviews will be conducted with students to understand their learning experiences with Moodle and interactions with students from local and the other institution.

To conclude, this study not only shows the value of cross-institution collaboration in delivering problem-based learning in a Chinese Medicine course, but also demonstrates a successful example of redesigning pedagogy with new education technology. It could bring our education into a new era surrounded with new learning experiences.

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