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Exploring Chinese Undergraduate Students' Perceptions of Collaboration and Satisfaction in the Context of Online Collaborative Learning

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Abstract: Students' perceptions of collaboration and satisfaction are key factors that affects students' dropout behavior. In this study, an online collaborative learning approach which integrated intra-group and inter-group discussions was proposed. Through questionnaire survey and interview, this study explores Chinese undergraduate students' perceptions of collaboration and satisfaction in an online collaborative learning activity. The results showed that students took a positive attitude to the process of collaboration and were satisfied with the online learning activities. Finally, some suggestions about design and implement online collaborative learning activity were proposed.

Keywords: Perceptions of Collaboration, Satisfaction, Online Collaborative Learning

1. Introduction

With the rapid development of Information and Communication Technologies (ICT), more and more university teachers in China attempt to provide online learning opportunities for students. Compared with traditional learning activity, online learning provides diversified and personalized environment for students' independent learning and collaborative learning. Students in online learning environment can share learning experience and co-construct knowledge by means of interaction (Zhang, Liu, Chen, Wang, & Huang, 2017). Despite the promise of online learning activity, students' dropout rates are disappointing, and online collaboration often appears disjointed conversations (Marbouti & Wise, 2016). Students' perceptions of collaboration and satisfaction are key factors that affects students' interaction and dropout behavior (Cheng & Chau, 2016; So & Brush, 2008). In another aspect, in order to improve students' learning enthusiasm and provide more opportunities for students to communicate and collaboration, teachers often organize intra-group and inter-group discussions. Studies showed that the interaction between learners in online learning environment was an important indicator of learners' perceived satisfaction (Luo, Zhang, & Qi, 2017; Yang, Li, Guo, & Li, 2015). Although there are a large number of studies on students' interactive network and perception, the research on the effect of online learning approach integrating intra-group and inter-group discussions on students' perceived collaboration and satisfaction is less concerned. This study explored students' perceptions of collaboration and satisfaction in an online collaborative learning activity and attempt to provide suggestions about design and implement online collaborative learning activity.

2. Background

This study was conducted in the course of Introduction to Educational Technology that lasted for 18 weeks with 3 credits. Due to the conflict between rich teaching contents and short teaching time of this course, the teacher designed a three stage online collaborative learning approach. The actual

online collaborative learning lasted for 3 weeks, and each collaborative stage took nearly 1 week with the teacher intervention.

In the first week, teacher posted a problem and some related resources on the Rain Classroom (see section 3). Group members used QQ to discuss the problem asynchronously and reached a preliminary agreement. Finally, each group submitted a courseware to show their group's conclusions.

In the second week, teacher first shared each group's courseware in the class. Every student was asked to read the content of the courseware in advance, and finally teacher organized a synchronous class discussion, and the aim was to promote the participation and engagement of class members.

In the third week, each group modified the courseware of their group on the basis of class discussion and shared the final courseware in the class.

Finally, the teacher and students summarized the answers of the target problem and each student submit a reflective journal to the teacher.

3. Online learning environment

In this study, we integrate the Rain Classroom (http://ykt.io/) and QQ to create an online learning environment. The Rain Classroom can provide many teaching functions, including organizing classroom teaching, posting problems, sharing resources, and collecting students' answers. QQ can support information release, synchronous and asynchronous discussions. In this study, we used the QQ to organize online discussion groups (see Fig. 1).

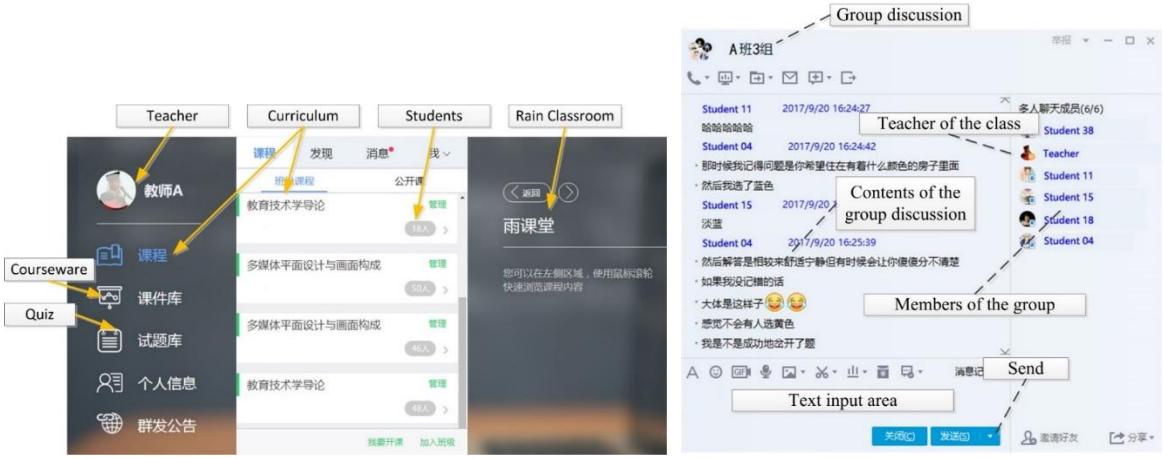

Fig 1. The interface of Rain Classroom (left) and QQ (right)

4. Methods

4.1 Participants

The participants were 48 first year students from one class of a university in central China. Nineteen of participants were male (39.6%) and twenty-nine were female (60.4%). Before this study, the participants did not have prior experience in collaborative learning, and drew their computing skills mainly on the computer course. Students teamed up and each group consisted of three to six students. All the students were divided into 13 groups and each group recommended a leader to organize and coordinate their online learning activities. All the demographics and related information of students were replaced with a serial number as identification.

4.2 Instruments

4.2.1 Perception of collaboration scale

The perception of collaboration scale was modified from Lee and Tsai (2011) and had six five-point Likert-type items ranging from 1 as strong disagree to 5 as strongly agree (see Table 2). The higher the rating score, the higher students' perceptions of online collaboration. The reliability of the original instrument is higher than 0.844 (Cronbach's alpha).

4.2.2 Satisfaction scale

The perception of satisfaction scale was modified from Bolliger and Halupa (2012) and had eight five-point Likert-type items ranging from 1 as strong disagree to 5 as strongly agree (see Table 4). The higher the rating score, the higher the perception of the satisfaction. The reliability of the original instrument was 0.91 (Cronbach's alpha).

4.3 Data collection and analyses

Questionnaire survey and depth interviews were employed in this study. The questionnaire of pre-survey consisted of a set of demographics items of students, including student IDs, Gender, Computer Skills, etc., and perceptions of collaboration. The questionnaire of post-survey consisted of the demographics items, perceptions of collaboration and satisfaction. All the students of this class had participated in the pre-survey and the post-survey, and the response rate was 100%. The results of the questionnaires were analyzed by using the STATISTICA software. The reliability of the perceptions of collaborative scale was 0.905 (pre-survey, Cronbach's alpha), and 0.898 (post-survey, Cronbach's alpha), and the reliability of the satisfaction scale was 0.916 (Cronbach's alpha), which indicating that the internal reliabilities were sufficient. The Shapiro-Wilk test was used to check the normality of distributions of the measured items' values of the two questionnaires and the results were significant (p=.000), showing the measured items of the two questionnaires did not have normal distribution of data. Face to face interview were adopted with the teacher and 5 students (female=3, male=2) of the class using purposeful sampling (Maxwell, 2013) when the online learning activities were finished. Each interview lasted between 15 and 20 minutes. All interviewees names were replaced with pseudonyms. The results of questionnaires and interviews were combined in the results section.

5. Results

5.1 Students' perceptions of collaboration before and after the online collaborative learning activities

Table 2 shows the means and standard deviations for students' perceptions of collaboration before and after being involved in online collaborative learning activities. All the means are higher than 3 in two surveys which means these students took a positive attitude to the online collaborative learning experience. Before the online collaborative learning activities, students had the strongest perception in providing feedback to peers' ideas, and the lowest perception in sharing learning materials. After the online collaborative learning activities, students had the strongest perceptions in reading and reviewing learning materials, and the lowers perceptions in providing feedback to peers' ideas.

Table 2
Means and Standard deviations for perceptions of collaboration

	Pre-survey		Post-survey	
Question	Mean	Std.Dev	Mean	Std.Dev
It is important to actively discuss problems with peers in online learning activities.	4.16	1.027	4.55	0.561

It is important to share learning materials with peers in online learning activities.	3.83	1.001	4.52	0.690
It is important to provide feedback to ideas suggested by peers in online learning activities.	4.22	0.951	4.28	0.701
It is important to share learning experiences with peers in online learning activities.	4.16	0.996	4.50	0.563
It is important to use online learning information provided by peers.	4.20	0.946	4.38	0.655
It is important to read and reviewed learning materials before online learning activities.	4.19	0.941	4.63	0.604

Table 3
Means and Standard deviations for perceptions of satisfaction

Question	Mean	Std.Dev
I am satisfied with the online learning environment (the Rain Classroom and QQ), because I can participate in the online discussion by using mobile phone easily.	4.30	0.903
I am satisfied with the theme and content of online discussion, because I can apply what I have learned in many different situations.	4.28	0.826
I am satisfied with the accessibility and availability of the teacher.	4.16	0.895
I am satisfied with how much I can relate to other students.	4.00	1.141
I am satisfied with the flexibility of the online collaborative learning activities afford me.	4.25	0.926
I am satisfied with the quality of interaction between all students.	4.38	0.701
I am satisfied with my performance in the online collaborative learning activities.	4.11	0.819
I am very satisfied with this course and will recommend this course to others.	4.31	0.941

Wilcoxon-Mann-Whitney test (Fay & Proschan, 2010) was used to determine whether there was significant mean difference between students' perceptions for collaboration before and after being involved in online collaborative learning activities. The results showed that the increase of the perceptions of collaboration were at the significance level ($Z=-2.080$, $p=0.038$). The findings indicated that interaction and collaboration in online learning activities have a significant effect on students' experience in collaboration.

5.2 Students' perceptions of satisfaction

Descriptive statistics were conducted to examine students' perceived satisfaction scores. Table 3 shows the means and standard deviations of students' perceived satisfaction scores after the online collaborative learning activities. All the sample means are higher than 4.0 which means these students felt very satisfied with the online collaborative learning experience. Students reported the strongest perceptions of satisfaction with the quality of interaction between peers (4.38), and the lowest perceptions of satisfaction with the relationships with other students (4.0).

5.3 Interviews

Most of the interviewees were positive about the online learning environment.

"I am satisfied with the process of online discussion. QQ can record the content of online discussion, so I can participate in the discussion at any time." (Student A, Female)

"I can use the Rain Classroom and QQ easily. I will read the materials in Rain Classroom, and actively participate in the QQ discussion when I see someone posting." (Student B, Male)

Some students admitted that they did not perform well during the online learning activities.

"I don't have the awareness to preview the learning materials before class. I only read the learning materials when needed." (Student C, Male).

"If someone propose interesting but irrelevant topics, our discussion will beside the question. Moreover, many messages in QQ quickly disappeared." (Student D, Female).

"During the process of online discussion, someone have been silent. If they are asked to give a simple response (agree or disagree), this will promote their participation." (Student E, Female)

The teacher also encountered a lot of problems: 1) how to arouse students' learning interesting, 2) how to pay attention to the online discussion of each group in time, and 3) how to highlight the off-topic phenomena for online discussion timely.

6. Conclusions and implications

After being involved in the online collaborative learning activities, students' perceptions of collaboration had increased. This finding was consistent with previous studies. Lee and Tsai (2011) suggested that students perceived higher level of collaboration in internet-based learning environment. The result of a study (Kurucay & Inan, 2017) with 77 students registered into an online course showed that students' perceptions of collaboration increased after being involved in online discussion. One interesting finding was that students had the highest perception of posting comments in the pre-test, but in the post-test, students had the lowest perception of posting comments. This finding was different from previous study. A study examined Turkish college students' perception of collaborative learning and perceived learning, results showed that these students had a positive attitude towards sharing learning experiences (Top, 2012). The reason may be that the comments made by students were not evaluated by their classmates, or the comments posted during class discussions disappear too quickly to be noticed. Comments posted were not valued, which affected students' perception of collaboration.

This study possesses several limitations which require further studies. Firstly, some students came from the same dormitory, these students had a lot of face-to-face discussions during the process of online discussions. Face-to-face and online discussions together had an impact on students' perceptions of collaboration and satisfaction, but face-to-face data was hard to collect. Secondly, in the process of class discussion, students' posts disappeared quickly due to the large number of participants, which made it difficult for them to keep up. Therefore, it is suggested that teachers should pay attention to face-to-face data collection in the process of organizing and implementing online collaborative learning. At the same time, teachers are advised to summarize students' views in time when organizing class discussion, so as to avoid the disorder and digression of the class discussion.

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