

Strategies for Smooth and Effective Cross-Cultural Online Collaborative Learning

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ABSTRACT

As the communication between different cultures is becoming more and more frequent, the competence of cross-cultural awareness and collaboration is emerging as a key ability in the 21st century. Face to face communication is the most efficient way to cultivate the competence of cross-cultural awareness and collaboration. However, there are very few opportunities currently available for university students to have such face to face communication. Therefore, cross-cultural online collaborative learning utilizing web 2.0 technologies is proposed in this paper as a way to cultivate students' cross-cultural competence. The purpose of the study is therefore to elicit strategies for smooth and effective cross-cultural online collaborative learning through a pilot study between the West and the East. Students of a Chinese University and an American University took part in the study. A mixed method research approach using questionnaire, interview and content analysis was used. The findings of the study revealed that students from both sides were interested in each other's culture, their attitudes to cross-cultural online collaborative learning were positive, and culture had an influence on learning methods. Social interaction played an important role, and students preferred to have more prior knowledge of each other's cultures and backgrounds. They were also inclined towards more in-depth individual conversations. As a result of this study, several strategies are proposed to facilitate effective implementation of cross-cultural collaborative learning in typical higher education settings.

Keywords

Cross-cultural, Collaborative learning, Online learning, Cultural awareness, Collaborative skills

Introduction

The global village nature of the world has become more salient in recent years (Landis, Bennett, & Bennett, 2003), and people from different cultures are communicating more and more with each other. The collaboration between different cultures has also been increasing dramatically. It has therefore become very important that current generation of students has acquired multi-cultural awareness and cross-cultural collaborative skills before it embarks on to the work environment.

Trilling & Fadel (2009) proposed 21st century skills in the book "21st century skills: learning for life in our times", with cross-cultural communication competence and collaboration competence being included in those skills. They stressed these skills to be essential for students for better involvement in future society and for having good performance in the future career. For cultivating students' cross-cultural ability, the first choice is to be immersed in another culture for a long time and have face-to-face communication with local people (Wang, 2011). Although the international activities of universities have dramatically expanded in volume, scope, and complexity over the past two decades, especially the study abroad programs allowing students to learn about other cultures for cultivating their cross-cultural awareness and cross-cultural collaborative skills (Altbach & Knight, 2007), very few students in fact are able to avail such opportunities, and existing opportunities are not sufficient by any means when considering the current notions that intercultural education should be implemented into all levels and forms of education in the future (Harms, Niederhauser, Davis, Roblyer, & Gilbert, 2006; Wang, 2011).

In this context, web 2.0 technologies have emerged as a potentially vast technological solution for global knowledge sharing, construction and distribution across groups, countries, and cultures (Friedman, 2005). When collaboration involves cross-cultural experience, it not only expands students' view of multiculturalism, but also enhances their self-concept and cross-cultural communication and collaboration competence (Cifuentes & Murphy, 2000). Cross-cultural online collaborative learning utilizing web 2.0 technologies is therefore proposed in this paper as a way to

enable communication and collaboration among students from different cultures. Cross-cultural dimension in this paper refers to the context where students from different cultures take part in online collaborative learning, without any emphasis on essential cultural attributes. Beginning with email, educators have applied technology to increase cultural awareness over the past three decades which has provided an online method for improving students' learning experience in a cross-cultural context (Liaw & Johnson, 2001). Learning management systems, blogs, social media platforms such as Facebook and Twitter, and even synchronous communication methods have been used by researchers to facilitate cross-cultural online learning (Law & Nguyen-Ngoc, 2010; Wang, 2012; Wang & Chen, 2012 ;Wu, Marek, & Chen, 2013). Researchers have also explored pedagogy, instructional design, task and assessment design for effective cross-cultural online learning (McLoughlin, 2001; Chen, Hsu, & Caropreso, 2006), and collaboration and community building are generally regarded as designs for cross-cultural online learning, which explains the rationale behind the current study on cross-cultural online collaborative learning.

Researchers have argued that learning through cross-cultural online collaboration is not an easy task (Kim & Bonk, 2002; Wang, 2011; Canto, Jauregi, & van den Bergh, 2013), and therefore it is important to identify and explore critical factors for smooth and effective cross-cultural online collaborative learning. "Smooth and effective" are used here to indicate the requirements for the implementing cross-cultural online collaborative learning. "Smooth" indicates that the whole learning process should be conducted by teacher with no difficulty, and "effective" means students from different cultures actually engage in the whole learning process.

Students' attitude has frequently been reported to be the most critical factor for success within computer-assisted learning environments (Ushida, 2005). Previous studies have also suggested that students' attitude towards cross-cultural learning plays an important role in the success of cross-cultural online collaborative learning (Lim, 2007; Chen, Hsu, & Caropreso, 2009; Chen, Caropreso, Hsu, & Yang, 2012). Law & Nguyen-Ngoc (2010) used social software to analyze cross-cultural online collaborative learning and pointed out that motivation of the learners as well as the facilitators is a critical success factor for the success of the online collaborative learning environments. Attitude is found in the literature as the foundation for the success of such new initiatives, and knowing the attitude towards cross-cultural online collaborative learning would be of great help in conducting successful cross-cultural online collaborative learning. Attitude is closely related to motivation, but the affective issues or motivation aspects in collaborative learning have largely been neglected in previous research (Dillenbourg, Järvelä, & Fischer, 2009).

The second critical factor is the strategies for implementing cross-cultural online collaborative learning. Online facilitation in a cross-cultural collaborative learning context is increasingly prevalent, but limited international cross-cultural online collaborative learning project implementations have been reported in the literature (Nguyen-ngoc & Law, 2009; Liaw & Bunn-Le Master, 2010; Wang, 2011; Leppisaari & Lee, 2012), partly because it is not an easy task to develop cross-cultural online collaboration (O'Dowd & Ritter, 2006; Hauck, 2007). Instructors and students need to overcome the problem associated with the synchronous communication across time zones and between institutions (Murphy, 2005), and they also need to be aware of differences between groups in terms of the levels of proficiency in using technology. Language may also be a barrier for cross-cultural communication (Wang & Reeves, 2007). It is also time consuming, since the instructors need to communicate and negotiate with teachers from other countries, and there may be difficulties in grading due to the differences in the academic quality standards among different cultures (Braskamp, 2008). Although some general tips for online cross-cultural collaboration have been proposed in the literature, such as being mindful, being comfortable with silence, encouragement for differing viewpoints, avoidance of debates, observations, and normalization of diversity, there is a lack of strategies for implementing cross-cultural online collaborative learning (Wang, 2011).

A case study has therefore been conducted to elicit strategies for smooth and effective cross-cultural online collaborative learning. A detailed plan for the collaborative learning process is proposed, along with a new data analysis framework. The data collected from the questionnaire, the posts in the learning management system and the focus group interviews are then analyzed using the proposed framework. The next section of the paper discusses the research framework, study process, the instruments, and data analysis methods. This is followed by a comprehensive analysis of strategies for smooth and effective cross-cultural online collaborative learning based on the findings of the study. The paper finally concludes with a discussion on the strategies to implement smooth and effective cross-cultural online collaborative learning and an outlook towards future research directions.

Methods

Research framework and theoretical background

Three theoretical models have guided this research: collaborative learning (Johnson & Johnson, 1999), model of “community of inquiry” (Garrison, Anderson, & Archer, 2000), and evaluation methods for cross-cultural collaboration (Law & Nguyen-Ngoc, 2010). Application of these models for cross-cultural online collaborative learning is discussed briefly in the following sections.

Collaborative learning

Collaborative learning is a situation in which two or more people learn or attempt to learn something together (Bruffee, 1993). Johnson & Johnson (1999) proposed positive interdependence, individual accountability, face to face interaction, social skills and group processing as the five basic elements of collaborative learning, and the grouping strategies were essential to meet the needs of the five basic elements. Dillenbourg, Baker, Blaye, & O’Malley (1996) suggested that heterogeneous groups could be beneficial as a condition to trigger conflicts and require negotiation and social grounding, in addition, Setlock, Fussell, & Neuwirth (2004) suggested that experimental groups with homogenous and heterogeneous cultural backgrounds had different perceptions of the study task. With respect to this importance, the rules for grouping such as heterogeneity in a group and homogeneity between groups were decided in terms of students’ features such as gender, age, learning style, knowledge base, and cultural background.

Model of “community of inquiry”

The model of “Community of Inquiry” assumes that learning occurs within the community through the interaction of three core elements: cognitive (construction of meaning through sustained communication); social (ability of participants to project their personal characteristics into the community); and, teaching presence (the design and facilitation of educational experience) (Garrison, Anderson, & Archer, 2000). In cross-cultural context, social presence could be facilitated by designed process of social lounge and cultural orientation (Chang, & Lim, 2002). Strong teaching presence and cognitive presence are important to allow collaborative knowledge construction to occur in communicatively lean environments (Osman & Herring, 2007). As teachers from both sides gather together with students in the collaborative process, teaching presence can be guaranteed and cognitive presence is facilitated in the process of technology integration.

Evaluation methods for cross-cultural collaboration

Law & Nguyen-Ngoc (2010) proposed three dimensions, namely social, cognitive and affective, to analyze the quality of cross-cultural interaction. Social means how well individual group members are collaborating which mainly refers to the participation in collaboration. Cognitive means how well the group performs the task. Affective means how satisfied or frustrated the group members feel during the task. For the cross-cultural online collaboration, cultural identity is also important (Parrish & Linder-vanberschot, 2010). Previous research has suggested that cultural differences could have a negative effect on students’ participation in online courses (Liu, Liu, Lee, & Magjuka, 2010), and language barriers for non-native speakers tend to detract from equal participation (Gunawardena, et al., 2001). Therefore, participation should also be considered as a key element for evaluating cross-cultural collaborative learning. With respect to these dimensions, cultural identity, affect, and participation are identified in this research as the three elements for evaluating cross-cultural online collaborative learning. For each aspect, multiple methods are used to collect data, as shown in table 1.

Table 1. Evaluation methods for cross-cultural online collaborative learning

Dimensions	Index	Data collection mechanism
Cultural Identity	Mutual cultural consideration	Posts about culture understanding
	Understanding of each other's culture	Questionnaire
	Culture’s influence on behavior	Interview with students

Affect	Attitude toward this cross-cultural online collaborative learning Satisfaction of team members in the collaborative process	Questionnaire Interview with students
Participation	Process of completing a group collaboration Mutual inspiration to reach a consensus	Posts Questionnaire Interview with students

Based on the three guiding theoretical models, a research framework is designed in this study, as shown in figure 1.

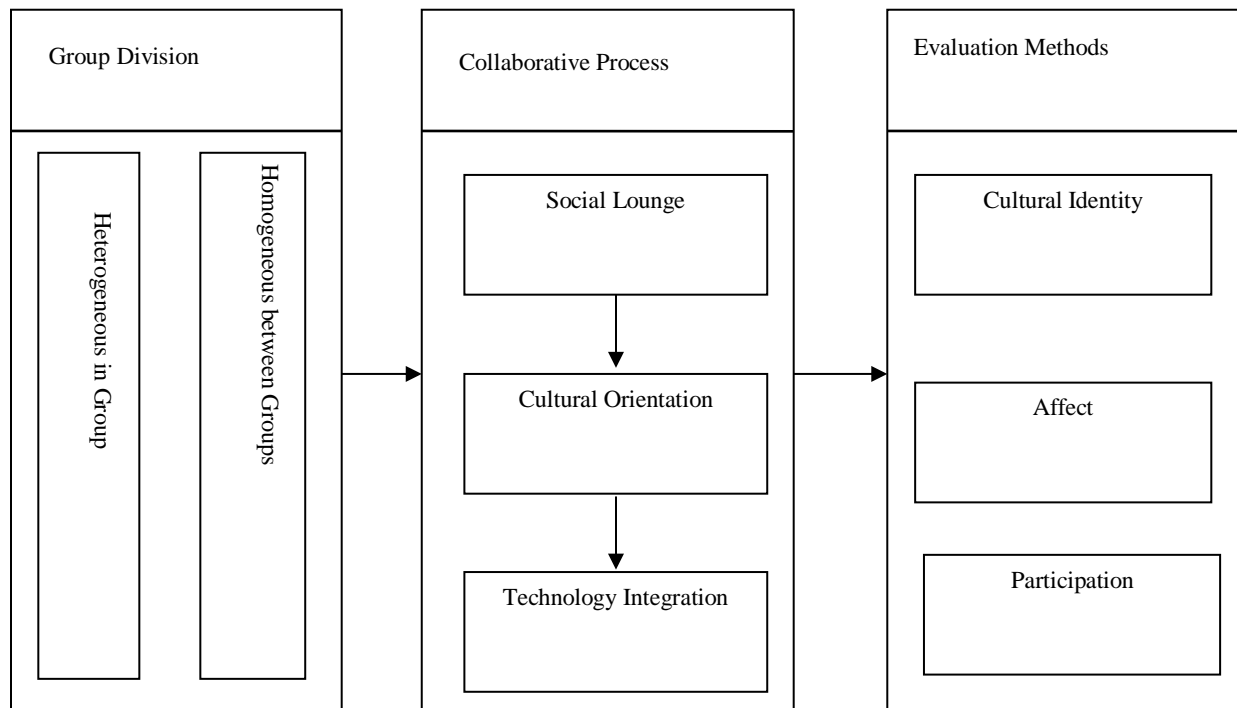


Figure 1. Research framework for cross-cultural online collaborative learning

Participants, group formation and collaborative learning process

A case study was conducted between a Chinese University and an American University. A judgment sample technique was used to select students from both sides. 28 students (10 males and 18 females) with major in educational technology from the Chinese university and 34 students (6 males and 28 females, none of them from Chinese origin) with major in educational technology from the American university took part in the research. All students at the Chinese university were designated as juniors with age range = 18~23 and average age distribution (mean) = 20.4. Most of the American students were juniors (82.4%), with some sophomores (8.8%) and seniors (8.8%), with age range = 18~44 and average age distribution (mean) = 28.6.

At first, students from China and United States were divided into different groups. In collaborative learning, group formation plays a critical role that affects the acceptance of group activities and the success of the learning process (Isotani, Inaba, Ikeda, & Mizoguchi, 2009). Membership or group composition is a critical component as it influences the motivation of individual learners, whose needs (cognition, social and emotion) determine how they behave in a group (Trautwein, Lüdtke, Marsh W., Köller, & Baumert, 2006). Previous studies have found that three to five members in a group are more effective for cooperative or collaborative learning, and Chun-min Wang (2011) suggested smaller groupings would be preferred by students. However, this research included two classes directed by teachers from China and US, where small groups were formed in each class, and therefore, the combined Chinese

and US students groups were large groups according to the rules for grouping. The participants were assigned into 5 groups, each containing 5 to 6 Chinese students and 6 to 7 American students. When dividing students into different groups, factors of heterogeneity (such as the level of English competence, learning style, learning performance, etc.) within each group and homogeneity (such as total number of students, formation of group, average learning performance, etc.) between the groups were taken into consideration. Each group was assigned a leader within the group who could take charge of the group in order to make sure that the mixed group work was conducted in close cooperation from both sides.

Secondly, the collaborative processes which lasted one month were divided into three successive stages: social lounge lasted for one week, cultural orientation lasted for one week after social lounge, and technology integration lasted for two weeks after cultural orientation. These collaboration processes were started with participants knowing each other, and in a cross-cultural context, knowing each other means knowing each other's basic information and knowing each other's cultural background. Social lounge enabled students from both sides to communicate with each other in order to know basic information about each other, such as hobbies, families, and so on. Cultural orientation enabled students to communicate in order to know about each other's culture. Technology integration forum enabled students from both sides to discuss some major topics with each other, such as what technologies were used in the class, how teacher integrated these technologies into curriculum, etc.

Effectiveness of the group work in such collaborative processes depends on the proactive monitoring and intervention by the instructors during collaborative activities through mechanisms for assistance, feedback, and evaluation (Capdeferro & Romero, 2012). Therefore in each stage, requirements and statements were presented to the students so that they understand their activities clearly. Due to the time zone differences, all these three stages in the online collaborative learning environment were preceded by asynchronous communication between the two sides. Students from both sides were asked to reply to each other's posts at least twice in the cross-cultural online learning environment. Chinese students gathered together in a classroom from 8:00-10:00 in the morning (China time), which is 19:00-21:00 in the evening in US (Eastern Time Zone). The online learning environment used in the study was Blackboard platform in English, which was selected after analyzing a number of Web 2.0 learning management systems and personal learning platforms, where many of the systems could not be used between China and the United States due to various firewall restrictions.

Instruments and materials

Both the qualitative and the quantitative research methods were used in this research. A questionnaire was developed based on the evaluation methods for cross-cultural collaborative learning. The quantitative data was collected from various close-ended questions of the questionnaire. The qualitative data was collected from the posts in the forum, through open-ended questions of the questionnaire, and from the focus group interviews.

To analyze the participation, the questionnaire contained open-ended questions related to the process of completing group collaboration activities and mutual inspirations to reach consensus. To analyze affect, the questionnaire contained both close-ended questions and open-ended questions related to the formal experience and attitude towards the cross-cultural online collaborative learning and satisfaction with the collaborative learning process. To analyze cultural identity, the questionnaire contained open-ended questions related to cultural differences.

The questionnaire was validated using "content validity ratio" (CVR). Five experts of cross-cultural research and educational technology were invited to give scores on the validity of the questionnaire. Based on the feedback from the experts, the questionnaire was revised. Final questionnaire included 12 close-ended questions with 5-point Likert scale (1= strongly disagree, 5=strongly agree) and 3 open-ended questions, as shown in table 2.

Table 2. Dimension and items of the questionnaire

Question Type	Dimensions	Items	Numbers of Items
Close-ended questions	Participation	1. I had no technological problem using blackboard for online learning and communication.	2
		2. Course resources (e.g., utilities, tutorials, handouts, sample work) helped support my learning needs.	

		3. Social Lounge helped acquaint me with class peers.	5
		4. Cultural blogs helped foster cultural awareness for cross-cultural learning.	
		5. I felt I was connected with my group to talk and learn together online	
		6. I felt I was connected with the class to talk and learn together online	
		7. The discussion with foreign peers contributed to my learning of subject content.	
	Affect	8. I had much experience working with students from other country before this cross-cultural online collaborative learning experience.	5
		9. This cross-cultural online collaborative learning contributed to my life experience.	
		10. This cross-cultural online collaborative learning helped expand my global perspectives.	
		11. I would like to have similar cross-cultural online discussions in other courses.	
		12. Overall, my cross-cultural online collaborative learning experience was positive.	
Open-ended questions	Cultural identity	13. The three most significant cultural differences I have observed from the cross-cultural online collaborative learning	1
	Affect	14. The three things I felt most valuable to me about the cross-cultural online collaborative learning experience were	2
		15. If I had a chance to work with students from a different culture again, I would do the following differently:	

At the end of the pilot study, students were requested to complete the questionnaire. 28 valid questionnaires from Chinese students and 34 valid questionnaires from American students were collected. Cronbach's alpha coefficient was calculated to test the consistency of the items within the valid questionnaires. The internal consistency values (Cronbach's alpha coefficient) in each dimension ranged from 0.85 to 0.95. Since Cronbach's alpha coefficient values higher than 0.70 are considered as good, and when the value is close to 1.00, it is considered very good (Fraenkel & Norman, 2003), the internal consistency values calculated in this study can be interpreted as very good. At the same time, a high number of posts (n=938) from the Blackboard were also gathered during the 4 weeks' collaboration.

In addition, focus group interviews were conducted to properly understand students' attitudes towards cross-cultural online collaborative learning experience and to elicit their suggestions for improving their experience. Focus group interviews provide multi-faceted instrument that can be used alone or in conjunction with other research methods, allowing the researcher to delve more deeply into the study of a phenomenon and provide enhanced understanding of the research (Vaughn, Schumm, & Sinagub, 1996). Focus group interviews were conducted with 8 students from China and 9 students from the United States, and the scope for these discussions covered participation, affect and cultural identity. The 8 students in China were interviewed as a focus group by one of the authors and the 9 students in the United States were interviewed as a focus group by the teacher in United States. The duration of both interviews was about 1.5 hours each. After interview, the audio of each session was transcribed, and the comments were organized by topic and edited in sequential order until broad themes emerged.

The quantitative data was analyzed using SPSS 21.0 statistical analysis software. The qualitative data, such as the open-ended questions, the posts and the transcripts were analyzed using content analysis method, which is the process of identifying, coding, and categorizing the primary pattern in the data (Patton, 1990). Three researchers carefully reviewed the data and made notes of the important keywords, themes, and categories that emerged from the data. The reviewed transcripts were then analyzed again to compare with previous summaries of key categories and

themes. Finally, the three researchers validated and discussed their coding decisions to reach a consensus for data coding.

Findings

The data obtained in this study was analyzed for three aspects: participation, social and affect aspects.

Participation aspect: Students' collaboration process was influenced by language and culture

Participation aspect mainly focused on the process of completing a group collaboration activity and mutual inspiration to reach a consensus.

The first question of the questionnaire was about the technological problems using Blackboard learning management system for online learning and communication. The second question focused on the course resources. Analysis of the data showed that there were significant differences between the responses of the Chinese students and the American students for both questions ($p < 0.05$), as shown in table 3. The Chinese students had some technological problems which were not experienced by the American students. On the other hand, the American students thought that the resources were much more helpful to their learning. From the focus group interviews, we found that Chinese students generally had problems in using the learning management system and the course resources in a completely English environment. Language was a barrier for Chinese students, but they expressed a positive attitude to conquer the barrier in future collaboration.

Table 3. Analysis of the close-ended questions of the questionnaire

Dimension	Question No.	China N = 28 Mean(SD)	America N = 34 Mean(SD)	Independent T-Test		
				t	df	Sig(2-tailed)
Learning Environment	1	3.32 (1.28)	4.41 (0.96)	-3.810	62	.000
	2	3.61 (0.63)	4.36 (0.80)	-4.102	62	.000
Collaborative Learning Process	3	3.50 (0.81)	3.70 (1.15)	-.634	60	.528
	4	3.82 (0.82)	4.08 (0.89)	-1.063	62	.292
	5	2.32 (0.98)	2.41 (1.21)	-.838	62	.405
	6	3.25 (0.93)	3.38 (1.11)	-.527	62	.600
	7	3.50 (0.64)	3.50 (1.00)	.065	61	.948
Attitude to the Learning Experience	8	3.71 (0.85)	3.32 (0.94)	1.782	62	.080
	9	3.79 (0.79)	3.76 (0.93)	.162	62	.872
	10	3.85 (0.91)	3.89 (0.91)	-.162	61	.872
	11	3.79 (0.96)	3.68 (1.13)	.442	62	.660
	12	4.07 (0.60)	4.24 (0.72)	-1.043	62	.301

From the focus group interviews, we also found that the Chinese students were not familiar with various details of the Chinese ancient culture, such as dragon boat day, the origin of Kuaizi, white snack lady legends, spring festival, etc. In the collaboration process, when Chinese students wanted to share such details of the ancient cultures with the American students, they had to search on the Internet to find both the Chinese version and the English version of these ancient cultural details.

From the content analysis of the forum posts, we found that the Chinese students were not good at asking questions, and they always endorsed the views of the teachers and other students. The views of the American students on others, including peers, teacher and expert were more questioning and critical, and they always asked questions and discussed their views with other students. The reason behind this seems to be the collectivism of Chinese culture and the individualism of American culture, as pointed out by Chen, Hsu, & Caropreso (2006). In the focus group

interviews, we also found that sometimes the Chinese students had the motivation to raise questions and reply to posts, but they felt it difficult to express themselves in English.

The Chinese students attached great importance to the harmonious atmosphere and relationship maintenance in the online collaboration. Even when they disagreed with others, they always exhibited mild and indirect expressions to express their opinions in order to avoid conflicts. The American students, on the other hand, were always focused on the learning task, and when their opinions were different from others, they usually directly expressed what they thought. These two findings could explain the fact that computer-supported collaborative learning (CSCL) in China has primarily remained at a rather superficial stage and the discussions do not go very deep, unlike western countries where CSCL has been found to be very successful (Huang, Zhang, Chen, & Xu, 2007).

Social aspect: Students were interested in each other's culture

Social aspect mainly focused on mutual cultural consideration, the attitudes towards each other's culture, and culture's influence on behavior.

“Social lounge” and “cultural orientation” were used as the instruments for social aspects and intended to enable students to get to know each other and understand each other's culture. The third question of the questionnaire was related to “social lounge”, while the fourth question focused on “cultural orientation”. Analysis of the data showed no significant difference in the attitudes of both the Chinese students and the American students as elicited from the statements “Social Lounge helped acquaint me with class peers” and “Cultural blogs helped foster cultural awareness for cross-cultural online collaborative learning” ($p > 0.05$). This suggests that the students found these two stages to be somewhat helpful for them in getting to know each other and understand each other's culture. In the focus interviews, majority of the Chinese students expressed that the social lounge was good for them to get to know the American students, but because they could not see each other and could not communicate synchronously, it was difficult to carry out deeper conversation.

The analysis of the content of the posts during these two stages revealed that the American students were very interested in Chinese culture and they communicated with Chinese students a lot on Chinese traditional culture, asking all sorts of questions regarding various festivals, the traditional legends, the famous great people in old China and so on. At the same time, the Chinese students were very interested in various aspects of American culture, such as Halloween, Christmas, famous movies, etc. But from the focus group interviews, we found that the Chinese students' unfamiliarity with Chinese traditional culture and their poor written English meant that they could not communicate properly with the American students on cultural issues. As can be seen in table 4, for the fourteenth question in the questionnaire, 28 out of 34 American students expressed that “learning about the Chinese culture” was “most valuable to me about the cross-cultural online collaborative learning experience,” and 22 out of 28 Chinese students expressed that “Culture and Lifestyle” was most valuable to them.

Table 4. Analysis of the open-ended questions of the questionnaire

Items	Question No.	US (n = 34)	China (n = 28)		
The three most significant cultural differences I have observed from the cross-culture collaborative learning	13	Cultural customs	25	Custom/Cultural	16
		Holidays	15	Holidays	5
		Child to parent (family) relationship	13	Attitudes to learning	4
The three things I felt most valuable to me about the	14	Learning about Chinese culture	28	Culture/Lifestyle	22
		Communicating with Chinese people	18	Learn about their major/our own discipline	10

cross-culture collaborative learning experience were		Learning about and using technologies to communicate	6	Broaden horizon/Different viewpoints	7
If I had a chance to work with students from a different culture again, I would do the following differently:	15	Communicate with them more frequently and for longer periods of time	13	Discussions with just individual students not entire classes	10
		Have more in-depth conversations	7	More in-depth conversations	9
		Have more prior knowledge of each other's cultures and backgrounds	7	Live chats/instant messaging (Skype)	7

The analysis of the contents of the forum posts also revealed that the Chinese students preferred to post information about themselves and their families at first, and always posted lot of such information, such as birthplace, what their parents did, harmonious relationship of family, personal interest, etc. On the other hand, the American students preferred to introduce only themselves at first, and seldom mentioned their parents. Analysis also showed that the American students always wrote ideas first and then listed evidence, while the Chinese students always wrote evidence first and subsequently provided the conclusions.

Affect aspect: Students' attitude towards cross-cultural online collaborative learning experience was positive

The affect aspect mainly focused on the attitudes towards the cross-cultural online collaborative learning and satisfaction of team members in the collaboration process.

The results of questions 8-12 and 14-15 revealed that both the Chinese and the American students did not have much collaborative learning experience with students from other cultures prior to this experiment, and most of the students thought that this cross-cultural online collaborative learning experience contributed to their life experience and expanded their global perspective. The same result were also found in the open-ended question "If I had a chance to work with students from a different culture again, I would do the following differently?", where, as shown in table 4, 13 out of 34 American students said that they would like to communicate and collaborate with the Chinese students for longer time, and 14 of them indicated that they would like to have more in-depth conversations. In the focus group interviews, students from both sides expressed that they really liked this new kind of cross-cultural online collaboration and they *wanted to try instant communication tools, such as Skype or video conferencing tools, in order to have more in-depth conversations*. The American students also expressed that they should have more prior knowledge of each other's cultures and backgrounds before carrying out collaborative learning.

Analysis of the chat log revealed the satisfaction level of the team members in the collaborative process. In the first two learning stages, namely "Social Lounge" and "cultural orientation", there were many posts by each student, and the speed of the replies was also quite high. However, in the third stage of "Technology integration", posts were mainly those that were required by the teachers, and very few replies were received for each post. This indicated that the students were more satisfied with the first two stages than the third one. The focus group interviews confirmed this where most of the Chinese students expressed that they felt it was not easy to express the professional words in English in the "technology integration" stage. Although the Chinese students wanted to communicate with the American students about their major topics, they could not write many posts and replies due to language barrier.

Discussion

The aim of this research was to find strategies to conduct smooth and effective cross-cultural online collaborative learning. Analysis of the responses received through the questionnaires and interviews, and the analysis of forum posts identified a generally positive feedback from both the Chinese students and the American students on their attitudes towards cross-cultural online collaborative learning. The students felt that this kind of online collaboration could help expand their global perspective to some extent. Moreover, both the Chinese student and the American

students expressed their willingness to have similar cross-cultural online collaborative learning in other courses. At the same time, both the Chinese and the American students realized the importance of having such international exposure and felt that majority of them did not have the chance to communicate face to face with foreigners. Therefore, such cross-cultural online collaborative learning experience would go a long way towards meeting the needs of the students for improving their multi-cultural awareness and cross-cultural collaborative skills.

A number of strategies were identified in this experiment that could promote the implementation of cross-cultural online collaborative learning.

The first strategy identified in the experiment was the topic setting model for cross-cultural online collaborative learning. Collaboration begins with interaction — participants show awareness of each other’s presence and begin to relate as a group (Murphy, 2004). In this study, students had one week to understand each other in “social lounge”, one week to know each other’s culture in “cultural orientation”, and two weeks to exchange their major knowledge on a particular topic. Students were active and engaged in the first two weeks, and they were satisfied with the process of knowing each other and about their culture, which would foster cultural awareness and feeling to relate as a group. Students also showed great interest in each other’s culture. However, in the last two weeks, students were not very engaged, the reason for which was the improperly set topic that did not match with their prior knowledge. Conversations with the teacher in the United States revealed that a proper topic was critical for the collaboration, and setting of the topic should consider the knowledge base and the learning content from both sides, as shown in figure 2. The collaborative learning topic should be the overlap of the three circles which means setting topic should consider the learning content and what the group members from both sides already know. So, the analysis of students’ prior knowledge and analysis of learning content are two main factors that must be considered when setting up the collaborative learning topic. In other words, social interaction and cultural interaction are the basis for cross-cultural online collaborative learning, and the collaborative learning topic should overlap the learning content and the knowledge groups members from both sides already have.

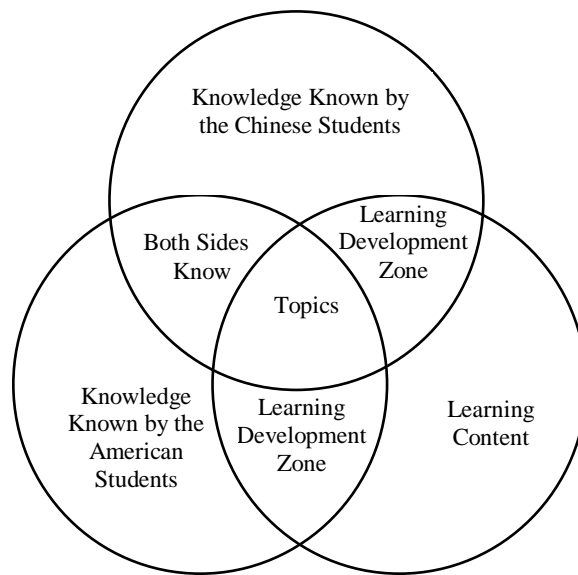


Figure 2. Cross-cultural collaborative learning topic set Model

The second strategy identified in the experiment was teacher’s task model for implementing cross-cultural online collaborative learning. Teachers design the whole learning environment, control the collaboration process, and evaluate the learning outcomes. It is very important to identify what teacher should do for implementing cross-cultural online learning. Firstly, teachers from both sides should consider group division, which is based on two principles: heterogeneity in a group and homogeneity between groups. Secondly, designing learning environment could consider three sequenced stages including “social lounge”, “cultural orientation”, and “technology

integration.” Thirdly, evaluation methods should contain three domains, namely cultural identify, collaboration process and affect.

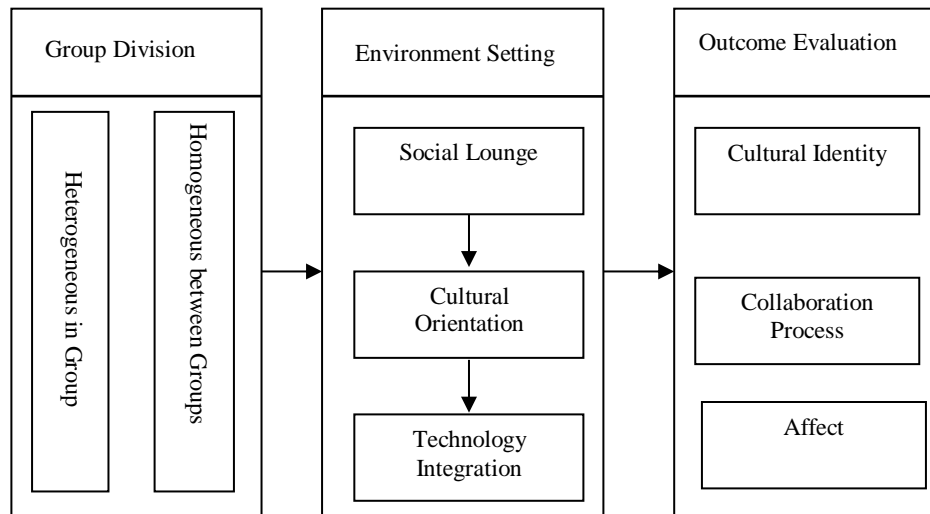


Figure 3. Cross-cultural collaborative learning teacher's task model

The third strategy identified in the experiment was the use of bilingual language resources in the learning environment to overcome language barriers during cross-cultural online collaborative learning. The Chinese students had problems in English learning environments, which added extra cognitive load for them. In such situation, use of bilingual language resources in the learning environment could serve towards reducing the cognitive load, fostering better communication and more effective collaborative learning process. In the data collected, we found that the Chinese student were not familiar with Chinese ancient cultures, such as dragon boat day, Kuaizi, white snack lady, spring festival, and etc. Therefore, the basic cultural terms could be listed in both languages as resources for students.

The fourth strategy identified in cross-cultural online collaborative learning was the ability to take into consideration the influence of the unfamiliar culture on interaction. Culture has a very important influence on students' learning style, and students from different cultures behave differently from each other (Kim & Bonk, 2002). Troubles will arise if cultural differences are not taken into account, and as a result, the collaboration may even fail between the students of different cultural backgrounds. For example, the Chinese students were not good at asking questions and always used a mild and indirect way to express their different opinion; while the American students always focused on the learning task and expressed their views directly.

Students' positive attitudes towards cross-cultural online collaborative learning demonstrated that this kind of collaboration has a future. However, further research on the collaborative process, the culture's influence and the language barriers will be important to improve such kind of collaborations in terms of smoothness of the process and better effectiveness.

Conclusions

This study found that the implementation of cross-cultural online collaborative learning should (1) take the social interaction and cultural interaction as the basis for collaboration and set collaborative topics that overlap the knowledge base of both sides; (2) consider teacher's task model as a tool for teachers to implement cross-cultural online collaborative learning; (3) provide bilingual language resources; and, (4) pay attention to culture's influence on the collaborative learning process.

The results of this study should not only be useful for future Chinese-American student collaborations but the generic nature of the results should also be useful for other cultures. Feedback from the participants of this research also indicates that university policy makers should advocate cross-cultural online collaborative learning in order to promote students' global perspective and multi-cultural understanding.

The students in this study also expressed desire for more synchronous collaborations and indicated that they would want to have online face to face communications. As the high bandwidth internet access is becoming more accessible in educational institutions all over the world, the next step for cross-cultural online collaborative learning should be to integrate synchronous communication tools (such as WebEx, JoinNet and Adobe Connect) into the cross-cultural collaboration.

The findings also indicated that students found it difficult to collaborate when they did not have sufficient background knowledge. Based on the findings and further analysis, a topic setting model is proposed in this paper. However, the model has not yet been verified. As topic setting was found to be a critical factor in the success of collaborative learning, further research is needed to test the model.

This study focused on various strategies for smooth and effective implementation of cross-cultural online collaborative learning by examining the aspects of social, participation, and affect. Research is needed to also understand the effects of cross-cultural online collaborative learning on students' performances, as that is the ultimate aim of any learning process.

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