Cross-Cultural Collaborative Online Learning: When the West Meets the East

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Contemporary information and communication technologies have brought the world together by interconnecting more people in more nations. The rapid growth of online learning worldwide has created a need to study the design of online environments which foster inter- and multicultural learning communities. This study investigated cultural influences on students' online social and learning behaviors and students' opinions and attitude toward cross-cultural collaborative online learning. Based on the findings from this study and contemporary social constructivist theories, an instructional model was proposed.

Keywords: Cross-cultural, Online Learning, Collaboration

Current trends involving the global dynamics of internet connectivity and online communication have provided many opportunities to link people across geographic locations, professional domains, and work settings anywhere at any time. Increasingly,

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individuals from distinct cultural contexts and backgrounds are brought together to work as members of various working groups.

With the capabilities of modern information and communication technologies, academic institutions are exploring the potential for multicultural education to enable students to develop the knowledge and skills needed to succeed in the 21st century global society. Students thus need to develop not only a sense of multiculturalism but also the skills of effective communication, collaboration, and social interaction in order to appropriately interact with people from different cultures. An effective instructional model to guide the design and implementation of cross-cultural online learning intended to foster inter- and multicultural online learning communities needs to be clearly specified.

Although online education provides opportunities for teachers and learners from around the world to collaborate, the cultural context of participants in an online learning environment may influence the behaviors of participants and affect learning and interaction in collaborative online learning situations. The purpose of this paper is to present the results of our study investigating the potential for cultural influences on online group learning. We then specify instructional design strategies for effective cross-cultural online learning based on three interrelated theoretical and empirical domains: intercultural communication, social constructivism, and online collaboration.

THEORETICAL FRAMEWORK AND RELATED LITERATURE

Social constructivists view learning as the social construction of knowledge through interaction mediated by language or socio-cultural dialogue (Bonk & Cunningham, 1998; Vygotsky, 1978). People gradually learn to interact socially as they develop their understanding of social norms and ability to evaluate each other's actions according to systems of shared values and beliefs (DeFleur & Bal-Rokeach, 1982). Individuals from different cultures engage in and expect different communication practices and behaviors during interactions in learning or work environments. Understanding intercultural communication involves studying links between culture and communication.

CULTURE AND PERCEPTION

Culture is learned, not inherited, therefore, culture itself becomes the context for all teaching and learning experiences. Culture reflects a set of common events, values, attitudes, beliefs and behaviors for any particular group of individuals. For example, people need shelter, but the choice of a specific paint color for a particular room in one's home is a learned response, the result of cultural influences. Such individual desires are the result of specific learning experiences (Mireglia, Law, & Collins, n.d.).

Since education necessarily occurs within culture (Bruner, 1996), culture plays a potentially significant role in instructional planning and design. Rose (2005) recognized the relationship between constructivism and cultural studies in terms of knowledge and learning, emphasizing cultural studies as an element of instructional design and planning. Rothstein-Fisch, Trumbull, Isaac, Daley, and Perez (2003) reflected Vygotsky's (1978) perspective about the mediating role of language and social experience in the development of individual knowledge. They stated that, "What counts as knowledge or knowing, methods of teaching, and means of evaluating students' learning are all culturally defined. …ways classroom activities are organized and … teachers communicate reflect and foster certain cultural values." (p.124)

People behave according to their perceptions of the world. Cultural experiences affect social perception and therefore people's communication with each other, including the

potential for misinterpretation based on social misperception (Rohrlich, 1983; Samovar & Porter, 2002).

In a review of the literature on person perception in cross-cultural settings, Oddou and Mendenhall (1984) noted several relevant findings, such as individuals' preferences for members of a perceived in-group over an out-group; that the basis for group identification may vary, including factors such as ethnicity, occupation, and religion; and an inverse correlation between frequency of contact between members of cultures and the amount of stereotyping. Person perceptions seem to influence subsequent learning, potentially further reinforcing perceived distinctions. Such socio-cultural influences would significantly affect teaching and learning in cross-cultural learning situations.

COMMUNICATION

Communication and culture are inextricably interconnected; how we come to know ourselves and our world involves complex social processes of communication (DeWine, Gibson, & Smith, 2000). In the study of intercultural communication, the expectation for communication differences appears to be the basis for most research and reflection on intercultural communication (e.g., Broome, 1981). A variety of perspectives has been explored, including, the influence of attitude on communication (Broome, 1981); the relationship between psychological and interpersonal aspects of intercultural communication (Rohrlich, 1983); misunderstanding and cultural distance in intercultural communication (Hinnenkamp, 1999); and self-efficacy in cross-cultural, small group settings related to effects of training on group members' interactions (Campbell, 2000). With respect to intercultural communication and teaching, Rothstein-Fisch et al. (2003) studied the potential for shifting teachers' cognitive orientation with respect to their students' cultural orientation from one of individualistic to a more collectivist orientation as the result of explicit training. They discovered that significant shifts in teachers' perspectives resulted from training in the socio-cultural norms and beliefs of their students' cultures, and these shifts in attitude and orientation lasted long beyond the period of the training in the study.

Communication context has begun to be explored in the domain of internet-based virtual communication, which typically occurs through written rather than spoken interactions. Written communication lacks the socio-cultural cues (Roald, 1999) and orderliness (Allwood & Schroeder, 2000) typical of face-to-face interactions. Understanding based on appropriate interpretation of print text will more likely occur when participants come to the situation with the required cultural capital to allow for mutual, reciprocal understanding (Roald, 1999). Even when participants strive for effective communication management, essentially close attention to the forms and content of communications, online written conversations were not comparable to conversations in the real world of face-to-face communications (Allwood & Schroeder, 2000).

Recent theoretical and empirical reports have indicated specific differences between Asian and English speakers' communication processes. Asian speakers use a topic-comment order in which the main point is postponed until enough background information becomes known for making connections and inferences, while English speakers tend to use comment-topic order to open a discourse with the main topic followed by supportive information. This difference seems to result in English speakers' use of a topic sentence to open discourse or anticipate critical information being presented at the start of a conversation; Asian speakers seem to wait until later in discourse for important information to be presented or made available (Scollon & Scollon, 1995). American students have also been found to focus on task communication,

distribute turns unequally, use low-context communication, resolve conflicts using either cooperative or competitive approaches, and use majority-rule decision-making (Oetzel, Meares, & Fukumoto, 2003). Taiwanese students have been shown to have greater sense of the power distance in teacher-student relationships, that is, the perception of teacher authority defining the relationship between teachers and students, than American students (Cifuentes & Shih, 2001; Hofsted, 1986).

Teng (2005) studied Taiwanese and American students' online communication. Her findings suggest that increased motivation led to greater cross-cultural sensitivity and more effective cross-cultural communication; a heightened sense of belonging to the learning environment and confidence in communication competence led to a greater likelihood of acquisition of cross-cultural communication skills; and an increased sense of belonging to the learning community led to heightened confidence during communication with others.

Other recent studies have examined the potential for cultural influences on learning and communication. In a study of Chinese and Finnish human resource development practitioners' views in a cross-cultural e-learning course, Slotte and Tynjälä (2002) concluded that an effective learning environment required creating a learning context that supported communication and collaboration based on strong pedagogical insight and management. Since communication appears to be bound by cultural context, collaboration occurs only if communications were understood within the context and carried out through interactivity. The primary challenge for collaboration was the team members' failure to understand the cultures of their partners.

Constructivists propose that meaningful learning must involve authentic learning tasks. Such tasks require cognitive information processing and intentional knowledge construction within the context of active collaborative interactions between teacher and learners and among learners. Thus, a constructivist learning environment must provide opportunities and tools for learning and communication to facilitate interaction and collaboration (Jonassen, Howland, Moore, & Marra, 2003).

An awareness of cultural communication differences should also facilitate the development of a constructive intercultural learning environment. Designers and instructors of cross-cultural online learning should become familiar with the need for cultural awareness and sensitivity, and the potential influences of effective communication and collaboration on learning resulting from appropriate training.

This study investigated the potential influences of cultural perceptions on cross-cultural online learning by exploring the following questions:
1. How do cultural perceptions affect students' social and learning behavior?
2. What are students' attitudes, feelings, and opinions about cross-cultural collaborative online learning?
3. How can social constructivist theories and pedagogy be employed in designing cross-culture online learning?

Based on our study results and relevant literature on intercultural communication, we derived an instructional model for the design and implementation of cross-cultural online learning.

METHOD

RESEARCH DESIGN

A mixed-method design involving the collection and analysis of both qualitative and quantitative data was used to address the research questions in this study (McMillan, 2004).

PARTICIPANTS

The study involved the collaboration of the instructors and students engaged in two graduate instructional technology courses taught at two different sites, a state university in southeastern U.S. and a university of education in Taiwan. The U.S. course was fully online with 10 students (3 males and 7 females); the Taiwanese course was a web-enhanced face-to-face classroom instruction. Five Taiwanese students (3 males and 2 females) participated in online discussions of two topics with the U.S. students as part of their web-enhanced sessions. Students in both groups ranged in age from the late 20s to mid-40s. The majority of participants in both sites were in-service teachers; several students were full-time graduate students.

PROCEDURES

Together, the instructors from both sites planned instruction and coached learning activities delivered via WebCT (an online course management system). Due to the time differences between Taiwan and the U.S., asynchronous communication was used for online discussions so that students from the two sites could correspond to each other at convenient times within their schedules, though this process resulted in time delays.

Students were randomly assigned to three discussion groups, each consisting of five members: one or two Taiwanese and three or four American students per group. Prior to the start of the formal instruction, students from both countries received an online orientation involving training for using online communication and learning tools. To get acquainted with each other, students posted and responded to greetings by members of the class in a social forum. Instruction began the following week. Students participated in online discussions for two 2-week instructional units addressing technology-related social, ethical, and legal issues in education. Each group determined its own collaboration strategies, the roles to be played by group member during learning (e.g., group leader; recorder) and project management strategies to be used to complete team projects.

During instruction, informal anecdotal notes about students' online interactions were independently recorded by both instructors. The Taiwanese instructor also noted her students' behaviors during face-to-face classroom instruction. After instruction, the instructors administered an attitude survey to their respective classes at the conclusion of the online collaboration intended to assess students' attitudes, feelings, and opinions about cross-cultural, collaborative online learning. Results of this survey were to be used for feedback and later revision of the course.

DATA ANALYSIS METHODS AND INSTRUMENTS

Qualitative data involved students' forum messages, responses to open-ended survey items, and the instructors' anecdotal notes, used as supplemental data. Quantitative data were derived from students' responses to survey rating items. These data reflected the socio-cultural and instructional context of the participants' experiences, and were interpreted in terms of the literature on culture and perception and communication.

Content analysis is the process of identifying, coding, and categorizing the primary pattern in the data (Patton, 1990). This method was used to analyze the content forum messages, instructor anecdotes, and student response to open-ended survey items. Descriptive analyses were conducted on survey rating items (see Appendix). Cross-tab followed by chi-square procedures were applied to examine potential differences between the U.S. and Taiwanese groups.

Forum messages. The unit of analysis was a single message, defined as a written text of one individual intended for other group members or the instructors. Content analysis was the method used for analyzing text messages (Silverman, 1993). The content of each message posted in the discussion forums was analyzed using the following procedure to identify the influence of cultural traits or social perceptions on the behavior of group members.

1. Arrange messages chronologically by date and time;
2. Identify key behaviors evident in the message content;
3. Code each behavior in terms of expressions of social perception and/or cultural traits with reference to relevant literature;
4. Group coherent or regularly recurring behaviors;
5. Establish the patterns of behaviors;
6. Sort behavior patterns into categories;
5. Label the categories (categories must be mutually exclusive).

Instructor anecdotal notes. The two instructors made informal anecdotal records regarding student online behaviors (both online and classroom behaviors of Taiwanese students were noted). Based on the instructors' judgments, student behaviors were organized into descriptive categories of students' typical questions and requested assistance, and students' attitude and behavior toward learning, teachers, working and interacting with other students.

Attitude survey. The survey consisted of 9 rating items using a five-point Likert scale (5=Strongly Agree, 1=Strongly Disagree) and three open-ended narrative items (see Appendix).

The attitude survey was developed by the two instructors (see the Appendix). Face validity is clearly evident in the statements' structure and content reflecting the core issues of the research interest: technology use, collaboration, and online interaction. Content validity reflected the relevant literature regarding the potential influence of cultural perception and communication on students' online interactions and the research questions driving this study. The two instructors determined the final structure and content of the survey through a process of discussion and revision resulting in 100% agreement about the items to be included.

RESULTS

The results are presented in terms of the three research questions addressed in the research.

RESEARCH QUESTION 1: HOW DO CULTURAL PERCEPTIONS AFFECT STUDENTS' SOCIAL AND LEARNING BEHAVIOR?

The messages of Taiwanese and American students revealed cultural characteristics in terms of four themes derived from the literature.

Collectivism vs. individualism: Perceptions of self and groups. Taiwanese students tended to post long introductory messages presenting themselves in the context of family relationships such as parents' occupations, number of siblings, family birth order, personal interests and hobbies, and if married, spouse and children. American students typically posted brief introductions focused on themselves, reflecting jobs, personal experiences, interests and hobbies. Although several American students included spouses and children in their introductory messages, none mentioned parents.

During unit assignment discussions, all three American group leaders used a process involving a division of labors, in which all group members were responsible for

individual components of the overall task. For example, the recorder assembled the parts into a complete assignment before submission. Though the approach used by Taiwanese students was not documented in the forum messages, the instructor at the Taiwanese site indicated that her students usually work together for the assignments. Taiwanese students did use the words "we" "our" and "us" in their messages more often than American students, who tended to use "I" "my" and "me" more frequently. Additional evidence in support of this distinction came from survey result which indicated a higher percent of Taiwanese students (80%) than American students (40%) preferred to complete the assignment collaboratively.

Further evidence of a culture-based difference in interaction patterns was derived from both instructors' anecdotes about students' learning behavior. U. S. and Taiwanese students' attitudes and behavior toward learning, teachers, working/interacting with the other students differed. For example, Taiwanese students expressed a desire to learn and do their best, while U. S. students expressed their desire to strive for excellence, to be the best. Both instructors felt that Taiwanese students' respect their teachers as authorities, while U. S. students' view teachers more as peers. Taiwanese students' appeared to be passive toward interacting with group members, while U. S. students' appeared actively engaged and energetic. The Taiwanese instructor noted that Taiwanese students were typically outspoken and actively participated during their face-to-face classroom instruction but they appeared to be more reticent during their online discussions in this cross-cultural learning experience.

Furthermore, these students' survey narrative responses suggested that their online inactivity was due to fear of incorrect English use resulting in concerns of loosing face (embarrasment due to their English language competence) and dragging the group behind.

Pattern of discourse. Taiwanese students typically posted long, detailed first messages, including broader range of information reflecting family and other social experiences. American students' responses were usually shorter and focused on the personal interpretation of the topic or case scenarios being discussed. Instructor notes indicated that students asked quite different typical questions during the training and learning process. For example, Taiwanese students asked content-related questions, such as, "Why not select discussion topics interesting to both groups?" while U.S. students asked procedural questions, such as, "May we work on assignments independently or within the U.S. culture group?" Help requests also differed by culture. Taiwanese students asked for help doing English language editing, while American students asked for clarification of assignment requirements. These differences may be because English was the language for communication and U.S. was the host site.

Communication context. Taiwanese students more frequently included emoticons in their messages, apparently intended to aid the emotional expression, compared to American students' messages. American students sent messages summarizing and confirming the ideas expressed in the messages sent by Taiwanese students several times during their discussion. For example,

> Ilin [pseudonym], thank you for the very interesting information. Please let me restate to see if I understand situation in Taiwan as you explained it…. As I understand situation in Taiwan, if I was parent of a deaf child, I could choose between a special class with special learning tools but have untrained teachers and social stigma or choose to have my deaf child in normal class which lacks special learning tools and thus minimizes learning. Is my understanding correct?

Perceptions of time. During the unit discussion, Taiwanese students typically posted messages in the middle or toward a later stage of the discussion. The speed of responding

to postings, the conversation pace, starting and ending dates for discussions and deadline seemed to of less concern as compared to their American partners. Under the pressure of the due date, American students negotiated to work independently or with the American students only. Taiwanese students typically asked about procedures and responsibilities for completing their assignments. They seemed not to experience the same concerns or pressures with respect to time per say. Taiwanese students considered American students aggressive, whereas Americans thought the delayed of participation to be a weakness of this cross-cultural activity.

RESEARCH QUESTION 2: WHAT ARE STUDENTS' ATTITUDES, FEELINGS, AND OPINIONS ABOUT CROSS-CULTURAL COLLABORATIVE ONLINE LEARNING?

Table 1. Result of Students' Attitude Survey

Item Description	U.S. n = 10		Taiwan n = 5		Total n = 15	
	M	*SD*	*M*	*SD*	*M*	*SD*
1. I had no technological problem using WebCT for online communication.	5.0	.00	4.8	.45	4.9	.26
2. I had much experience working online with students from the other country before this experience.	1.0	.00	1.4	.55	1.1	.35
3. My comfort level of working with my group increased as our discussions continued.	3.5	.53	3.6	.89	3.5	.64
4. I think this cross-cultural collaborative online learning contributed to my life experience.	4.6	.52	5.0	.00	4.7	.46
5. I wish I had been taught how to work with foreign students prior to the start of the discussion.	4.0	.67	4.6	.55	4.2	.68
6. Through these online discussions, I have learned to work cooperatively.	3.1	.88	3.2	.45	3.1	.74
7. I felt that participating in these online discussions was valuable to me as an educator.	4.8	.42	4.8	.45	4.8	.41
8. I would like to have similar online discussions in other education courses.	4.0	.82	4.8	.45	4.3	.80
9. Overall, my experience of the online discussion was very positive.	3.5	.53	4.4	.55	3.8	.68

Table 1 shows descriptive analysis results of survey rating items for the two groups. Examining the group and total means and standard deviations, both U.S. and Taiwanese groups seemed to have few technological problems (Q1) and little or no prior experience working online with students from other cultures (Q2). On average, both groups of students had moderate comfort levels, which remained about the same at the conclusion of their online group experiences (Q3). Regardless of cultural background, students wished they "had been taught how to work" with students from different cultures before engaging in their group discussions (Q5). On average, both groups responded that only moderate levels of learning to work cooperative resulted from their online experiences

(Q6). On average, students appeared to agree that their online learning was beneficial to their personal and professional development (Q4 and Q7) and would consider similar online learning experiences in the future (Q8). However, on item 9, Taiwanese students seemed to have a more postive online learning experience (scored 4.4) than their American counterparteners (scored 3.5). Cross-tabulation result for item 9 indicated two of five (40%) Taiwanese students strongly agreed and three of five (60%) agreed that their online learning experience was positive where as five (50%) of the U.S. students indicated that their learning experience was positive, while the remaining five (50%) were neutral about their experiences. With respect to potential differences between the two groups, Chi square test resulted in no significant difference for items 1 through 8, but the result for item 9 ($X^2 = 5.91$, $df = 1$, $p = .015$) was significant.

   Three open-ended narrative items were used to explore students' attitudes about cross-cultural collboration and learning experiences more deeply. The results clearly indicated group-based differences.

   The first item asked the preference of learning mode (collaborative, independent, no preference) and the reasons of choices. Four of five (80%) Taiwanese students expressed a preference for collabortive interactions. Four of 10 (40%) American students indicated the same preference, while another four of 10 (40%) preferred to work independently; the remaining two (20%) expressed no preference. Table 2 reports example reasons for student work mode preference by nationality.

Table 2. Reasons for Learning Mode Selections

Preference	Nation	
	U. S.	Taiwanese
Collaborative	▪ more beneficial to learning process ▪ peer mentoring and collaboration push to go extra miles ▪ collaboration helps knowledge construction	▪ fun to work with students from different backgrounds ▪ help each other out, group work more fun ▪ take advantage of characteristics of online learning ▪ help understand different viewpoints and integrate into my knowledge ▪ share my opinion, acquire useful information regarding education in U.S.
Independent	▪ time restrictions and individual differences in way we work ▪ family and personal business make collaborative work difficult ▪ easier to do, self-paced, don't have to wait for others ▪ no group incompatibility issues	▪ discussion topics not in my knowledge domain ▪ I need more individual time to study and to enrich myself before I can contribute to the group
No preference	▪ I believe a mixture of collaborative and independent is necessary ▪ I can go either way	

   Table 3 shows examples of student responses by nationality regarding their perceptions of the most and least valuable aspects of this cross-cultural online

collaborative learning. Both groups identified more positive than negative aspects of their experiences, but the Taiwanese students made more explicit responses in the positive category. Both groups expressed the value in having an opportunity to work with and learn about other cultures, but the Taiwanese students made other, perhaps expectable, comments. They identified the opportunity to develop specific content knowledge and to work on their language and technology skills among the most valuable outcomes of their experiences, but they also identified broadened knowledge and life experiences as most valuable outcomes. The American students' comments primarily expressed their interest in their opportunities to work cross-culturally. Regarding what was least valuable to students, both groups identified time constraints with respect to developing real in-depth discussions. The American students noted the lack of participation as the other principal issue, while the Taiwanese students identified the need to spend time in preparation for discussions and feeling pressured.

Table 3. The most and least valuable collaborative online learning experiences

Value	Nation	
	U. S.	Taiwanese
Most valuable	▪ experience of working with someone in a different country ▪ finding out where other countries were on same topics ▪ being exposed to a different cultural perspective ▪ perspectives on Taiwanese culture as compared with American culture ▪ learning about people from other culture and their experiences	▪ learning about implementation of special education in the U.S. ▪ gaining experience of studying with American students ▪ opportunity to learn different educational system in other country ▪ expanding cultural experience ▪ gaining confident using English to communicate ▪ acquiring ability to use WebCT for online communication ▪ broadening knowledge and life experience ▪ understanding need in improving special education in Taiwan
Least valuable	▪ demands of course left little time for real communication ▪ lack of input ▪ lack of participation	▪ no time for in-depth discussion, a lot of pressure ▪ language barrier kept me on superficial discussion ▪ great amount of time spent on preparing unfamiliar discussion topics

DISCUSSION

Our results support the conclusion that culture appears to influence student self-presentation during the online forum social orientation.

COLLECTIVISM VS. INDIVIDUALISM: PERCEPTIONS OF SELF AND GROUPS

Taiwanese students' response patterns may result from the influence of collectivism in Chinese culture. American cultural values of independence and individualism may explain their pattern of responses.

The American use of division of labors with expectations for individual responsibity for independent parts of the overall task is considered to be *cooperative* rather than *collaborative* learning, that is, a synthesis rather than assembly of learning products, according to Ingram and Hathorn (2004).

Taiwanese students' constrained online behavior, especially with respect to language use as well as collaborative interactions, might be the result of Chinese perceptions of self-face and collectivism.

PATTERN OF DISCOURSE

As Scollon and Scollon (1995) indicated, English speakers typically initiate conversation using comment-topic to open with important points, whereas, Asian speakers initiate conversation using a topic-comment discourse pattern, including much detail prior to and leading to main points in conversations. This may account for the long first messages sent by Taiwanese students, as compared with the American students' typically shorter and more task-focused responses.

COMMUNICATION CONTEXT

The literature indicates that Eastern language cultures use high-context communication, an indirect verbal mode providing minimal information. The receiver of the message assumes the responsibility for inferring appropriate meaning (Porter & Samovar, 2003). The use of emoticons by Taiwanese students, compared to American students' absence of such symbolic indicators, may reflect the goal of Taiwanese to compensate for high-context communication typical of eastern cultures. On the other hand, American culture, classified by Porter and Samovar (2003) as a mid-context culture involving a communication style in which the context of conversation is clearly provided, might have led to American students to send summarizing and confirming messages several times during their discussions.

PERCEPTIONS OF TIME

Cross-cultural learning takes more processing time for effective communication, especially given communication context differences. Since the course was hosted by the U.S. university, and English was the language for communication, unfamiliarity with the American approach to teamwork, in addition to the apparent language challenge, may have contributed to the different learning behaviors. Efficiency is a critical criterion for judging job performance in American society but not in Asian society. This may explain why Taiwanese students considered American students to be aggressive, whereas Americans thought the delay of participation to be a weakness of this cross-cultural activity.

These perceptual distinctions may be additional evidence of low-context/high-context communication differences. Porter and Samovar (2003) stated that, "low-context people who rely primarily on verbal messages for information are perceived as less attractive and less credible by people from high-context cultures." (p. 234) This may account for the perception of aggressive Americans by the Taiwanese students. Given the American

emphasis on efficiency and the Taiwanese emphasis on group interaction and collaboration with less concern for schedules and timing, these behaviors may represent the influence of Asian's and American's temporal perception rather than result from communication context differences.

As discussed earlier, students' perceptions of time, self versus group, and cultural traits, such as collectivism versus individualism, may explain differences between these groups in preferred mode for learning in an online environment. Apparently, cultural awareness and collaborative training need to be designed into instructional activities, such as orientation, prior to formal instruction.

Students' attitudes, feelings, and opinions about cross-cultural collaborative online learning were clearly revealed through our analyses of their survey responses. As shown in Table 1, both groups revealed similar backgrounds and perceptions of their experiences across most survey items. On average, the resulting moderate comfort levels of both groups, which remained basically unchanged, may be explained by the high levels of response indicating that, regardless of cultural background, students wished they "had been taught how to work" with students from different cultures before engaging in their group discussions (Q5). Another potential limitation related to students' perceptions of learning to work cooperatively; on average, both groups responded that only moderate levels of learning to work cooperative resulted from their online experiences (Q6).

Despite the conclusion from both groups that students desired some type of cultural training or experience to support their online learning, on average, students appeared to agree that their online learning was beneficial to their personal and professional development (Q4 and Q7) and would consider similar online learning experiences in the future (Q8). Building comfort and trust among community members takes time. The short timeframe for collaborative learning, lack of cultural awareness, and insufficient scaffolding may account for these results. Instructional designers should take these factors into consideration and devise strategies to promote cultural awareness and group coherence. Instructors need to teach about and support students' developing collaborative interactions, especially with students from differing cultures. Teachers usually assume students know to communicate and work with others; often they do not (Jonassen, Howland, Moore, & Marra, 2003).

Language facility and cross-cultural awareness and knowledge yield the most likely explanations for all these differences, given that English was the lingua franca in which group interactions occurred. Taiwanese students, despite their abilities to communicate in English, experienced all the demands of dealing with an unfamiliar content in an unfamiliar medium with a developing language competency; the Americans had only to deal with the content and the technology. Again, this research provides further evidence that a variety of supports and resources should be included in as part of preinstructional preparations for cross-cultural instructional and learning experiences to result in the most productive and effective outcomes.

PRACTICAL IMPLICATIONS

The final research question will be addressed by providing practical implications for instructional design based on the literature and results of this study.

RESEARCH QUESTION 3: HOW CAN SOCIAL CONSTRUCTIVIST THEORIES AND PEDAGOGY BE EMPLOYED IN DESIGNING CROSS-CULTURE ONLINE LEARNING?

As noted in the literature review, constructivists believe that meaningful learning must involve authentic learning tasks that require information processing and intentional knowledge construction within the context of active collaboration and social interactions (Jonassen, et al., 2003). Individual knowledge construction is based on the combination of prior experience and social interaction with sophisticated and competent people with whom individuals interact through the use of language or socio-cultural dialogue (Duffy & Jonassen 1992; Jonassen, 1999; Vygotsky, 1978); the context in which learning occurs is foremost to the learning itself (McMahon, 1997). Thus, the learning environment must be supportive and resourceful to facilitate knowledge construction and application. Chen and Hsu (2005) indicated that an effective online learning environment must provide three support systems: technical, learning, and social, to build students' comfort in working with technology, instructional content, and members of the learning community during the process of learning.

Based on the above theoretical frameworks, literature review, findings of this study, and practical concerns, we propose the following model for the design of a cross-cultural online learning environment and activities:
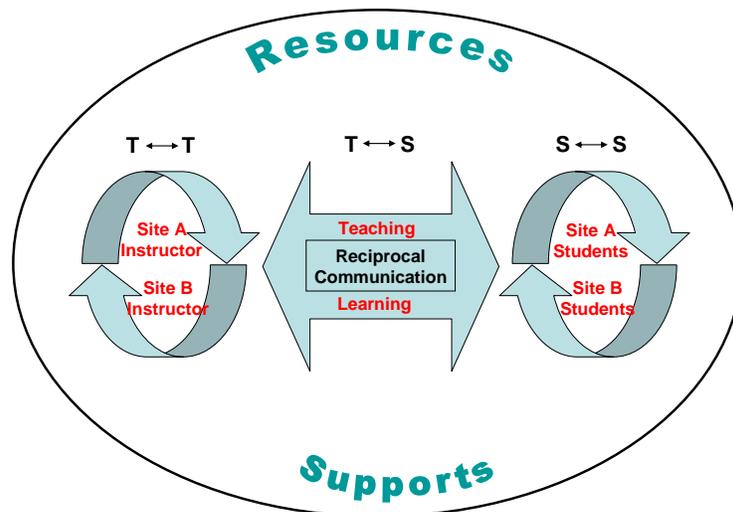

Figure 1. Instructional design model for cross-cultural online learning
Note. T = Teacher, S = Student, ↔ = Interaction

SUPPORT SYSTEMS

A technical support system may include the provision of a technical training workshop during course orientation, easily-accessed technology resources or a "Technical S.O.S." forum for the class members to ask, give, and receive help from the instructor and other students. A learning support system for cross-cultural online learning may include appropriate learning resources, guidance and assistance from the instructor, input from relevant experts and peers that promote an understanding of the cultural context of learning tasks and content. A social support system that helps students feel comfortable in sharing knowledge, feelings, experiences, values and goals with members of the community may include providing a collaborative skill building workshop during course orientation; developing group norms; valuing collaboration; encouraging interaction among group members to gain multiple perspectives and solutions; and creating online

social forums, bulletin boards, and a community calendar, all of which provide opportunities for social presence and interaction.

RESOURCES

Providing appropriate resources may assist students in acquiring knowledge about the peer learners' cultures and using tools to facilitate comfortable communication and collaboration for working together as a community. The following are examples of helpful cross-cultural learning resources.

Language/communication resources. Students for whom English was not used for daily communication often found language to be a primary obstacle for cross-culture online learning (Chen, Hsu, & Caropreso, 2005). Tools to remove or reduce language problems would facilitate two-way communication and social interaction. In turn, this would promote collaboration and knowledge co-construction. Helpful language tools may include online dictionaries, language translators, a thesaurus, and a virtual writing/editing center.

Culture/context resources. Commonly used culture-specific knowledge bases or expert systems include online encyclopedias, virtual cultural museums, subject or topic specific laws and policies (e.g., disability laws; No Child Left Behind Act), culturally-based frequently-asked-questions (FAQ), and lists of commonly used acronyms and idiomatic expressions.

Learning content resources. Learning content specific resources include subject knowledge learning maps to help students organize and plan their studying, online tutorials for various kinds of training, and productivity tools (such as software applications) for completing assignments.

PREINSTRUCTIONAL PLANNING: INSTRUCTORS' CULTURAL AWARENESS AND COLLABORATIVE SKILL TRAINING

Instructors must acquire knowledge of target learners and their cultural backgrounds so that they will be able to accurately, and therefore, effectively interpret, respond to, and manage students' online communication. It is equally important for instructors to acquire collaborative skills to effectively work together to design and deliver instructional material and activities.

Reciprocal communication and interdependent collaboration between the instructors from each site have a critical affect on the success of a cross-cultural online learning. The interaction and collaboration between the instructors begins with preinstructional planning and continues throughout the course. Thus, cultural awareness and collaborative skill training should be provided to the instructors prior to instructional planning. Such training would help facilitate the instructors' interdependency, knowledge sharing and learning from each other about students' culture backgrounds and technological skills, instructional content, and online pedagogy. The result of this collaboration provides a foundation for instructional planning of the course. The experience of working together during the preinstructional phase may also foster the two instructors' communication and collaboration skills.

INSTRUCTIONAL PLANNING

Learner analysis. The student is at the center of constructivist-based instruction. Learner analysis is therefore critical for designing an effective cross-culture online course. In addition to the commonly analysis of learners, cross-cultural online learning

should involve the analysis on participants' ethnic and cultural background; proficiency levels of the principal course communication language; prerequisite knowledge and skill for subject content; technological knowledge and skill levels; cultural knowledge and awareness; attitude toward cross-cultural online learning.

Instructional analysis. Instructional analysis identifies the learning context; course content, goals and objectives; learning tasks and activities; and the assessment methods for course and student performance evaluations. Instructional analysis of course content and topics for cross-cultural learning should identify instructional topics that are of common interest and are within the knowledge domain of all students. Instructors and students must be prepared to deal with possible conflicts regarding controversial or culturally sensitive content, e.g. religion or politics, in a professional manner; special linguistic features, e.g. acronyms or idiomatic expressions.

Learning tasks and activities. In the constructivist view of knowledge construction, the learning task is the vehicle through which knowledge develops (Jonassen et al., 2003). Therefore, the nature and complexity of a learning task has a direct influence on group communication and collaboration. Vygotsky's (1978) notion of the Zone of Proximal Development suggests that problem-solving and learning with more capable partners leads to construction of new knowledge and the development of multiple perspectives. Therefore, problem- and inquiry-based learning tasks would be suitable for cross-cultural learning. Saphiere (2000) suggests that learning tasks should be challenging but achievable within a given time frame when working across cultural and language barriers. Allocating extra time and energy for communication, to avoid falling behind the schedule and adding stress to students, will help support effective cross-cultural learning.

Assignment specifications. While problem-based learning tasks are usually assigned as group projects, attention must be paid to the potential for cultural influences on students' perceptions about time, self and group. Students from different cultures may have different preferences and experiences for independent or group work, different expectations about group roles and pacing of group activities. These cultural traits may affect group interaction and collaboration. Assignment specifications should be clear on expectation for teamwork; appropriate timeframes and submission dates; assessment rubrics; and appropriate resources to assist in successfully completing assignments.

ORIENTATION AND TRAINING

Preparing the students for cross-cultural online learning prior to the start of formal instruction is critical and has a direct impact on the success of students' learning, especially for students new to cross-cultural online learning. To prepare students for cross-cultural online learning, a course orientation addressing training for technical skill, cultural awareness, cross-cultural communication and collaboration skills, and familiarity with the peer learners and content map would help build students' comfort with technology, the learning content, and learning community.

INSTRUCTIONAL STRATEGIES

Successful cross-cultural online learning depends on frequent and effective two-way communication, interaction, and collaboration between instructors (teacher-teacher), among students (students-student), and between teachers and students (teacher-student) as indicated in figure 1. Instructors must work collaboratively to design and conduct instruction to achieve the learning objectives. Reciprocal two-way communication must continuously flow between the instructors about the process and products of students'

learning, while at the same time, two-way communication, interaction, and collaboration should occur among students within the same cultural group and across cultural groups. Instructional strategies are part of the learning support system. During instruction, instructors at each site communicate and interact with all students, establishing a learning community including all participants. Cross-cultural online instructors may employ effective instructional strategies based on social constructivism such as modeling, coaching, and scaffolding (Jonassen, 1999).

CONCLUSION AND LIMITATIONS OF THE STUDY

As information and communication technologies continue to develop, cross-cultural online course offerings will become more available, easily accessible, and popular. While cultures across the world come into closer contact, the degree of diversity will proportionally increase. Understanding how cultural perceptions and experience influence the thinking and behavior of learners from different cultures will help instructors design and conduct effective online learning and foster productive learning communities. Based on the results of this study, the following suggestions will extend the research on cross-cultural and multicultural online learning.

This study included relatively few students from only two cultures; therefore, generalizations of the results are limited. Future research should include larger samples and students from multiple sites and cultures. Another limitation reflects the brief duration of this study; therefore, an important area of research would be to extend the duration of the online collaboration to allow for a longer period of observation and data collection. Utilizing virtual ethnography would allow for the collection and analysis of data reflecting more potential depth and richness of communication. Finally, based on the results of this research, a model for the design of cross-cultural online learning and instruction has been proposed; this model should be implemented and assessed, thereby exploring its validity, reliability, and generalizability.

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APPENDIX
MIT512-440 Student Survey

Name: _____   Date: _____

Part A: Please respond to the following items as accurately and honestly as possible. **CIRCLE** the number after each item that best describes your level of agreement with the statement (5 = Strongly Agree; 4 = Agree; 3 = Neither Agree nor Disagree; 2 = Disagree; 1 = Strongly Disagree).

No	Survey Items	SA	A	N	D	SD
1	I had no technological problem using WebCT for online communication.	5	4	3	2	1
2	I had much experience working online with students from the other country before this experience.	5	4	3	2	1
3	My comfort level of working with my group increased as our discussions continued.	5	4	3	2	1
4	I think this cross-cultural collaborative online learning contributed to my life experience.	5	4	3	2	1
5	I wish I had been taught how to work with foreign students prior to the start of the discussion.	5	4	3	2	1
6	Through these online discussions, I have learned to work cooperatively.	5	4	3	2	1
7	I felt that participating in these online discussions was valuable to me as an educator.	5	4	3	2	1
8	I would like to have similar online discussions in other education courses.	5	4	3	2	1
9	Overall, my experience of the online discussion was very positive.	5	4	3	2	1

Part B: Respond to the following items by writing your answers in the space provided.

1. I prefer to do the assignments via
    ___ Collaborative group activities because _____
    ___ Independent/individual work because _____
    ___ No preference because _____

2. The three things that I felt most valuable to me about the cross-culture collaborative learning with American students were

    _____
    _____

3. The three things that I felt least valuable to me about the cross-culture collaborative learning with American students were

    _____
    _____