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## Facilitating cross-cultural understanding with learning activities supported by speech-to-text recognition and computer-aided translation

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### ABSTRACT

We designed and implemented cross-cultural learning activities for this study. Participants from two countries, geographically located very far from each other, represented different cultures that have no communication language in common. Two systems were applied to learning activities in order to enable interaction and information exchange among the participants: (1) a *speech-to-text recognition system*, which generates texts from a speaker's voice input in his/her native language and (2) *computer-aided translation system*, which simultaneously translates texts into the language of the speaker's foreign peers. The goal was to test the feasibility of learning activities supported by the two systems and their effectiveness for cross-cultural learning. To this end, we evaluated participants' learning outcomes, analyzed their online communication with peers, and carried out a questionnaire survey and interviews with both the participants and their instructors. The use of multiple data sources allowed triangulation of the findings, thus adding rigor to the research. We obtained three findings through this study. First, cross-cultural learning took place. Second, the questionnaire and interview results show that the two systems are easy to use and useful for cross-cultural learning. According to participants, even with no common language, they could still interact and exchange culture-related information using the two systems. Finally, the results indicate that the texts produced by the two systems are acceptable and useful for the cross-cultural learning of participants (except texts translated from Russian into Chinese in the second week). These findings suggest that the educators and researcher can implement cross-cultural learning activities for participants with no common language with the support of speech-to-text recognition and computer-aided translation systems, as these two systems can help participants to communicate and exchange culture-related information.

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### 1. Introduction

Today's world has been called a global village; it can be seen as a single multicultural community in which the lives of people are connected across boundaries through telecommunications (McLuhan & Powers, 1989). A global village's residents are no longer defined by their state citizenship; however, they are aware of the wider world and have a sense of their own role

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in making the world a more equitable and sustainable place (Bovair & Griffith, 2003). In a global village, people easily learn about important global issues and then attempt to address them by working together. For example, students from Italy and Germany study the building of minarets in Switzerland as a part of their international tele collaborative project, discuss the pros and cons of this global issue, and then share their opinions with a wider audience (Guth & Helm, 2012). In another global citizenship project, students in the United Kingdom and Ghana discussed the AIDS issue (Bovair & Griffith, 2003). When working on such projects, people need to understand the diverse cultural backgrounds of others in order to collaborate with them effectively. Otherwise, a lack of cultural sensitivity may hamper the relationship and cause problems. That is to say, it is important to recognize that what people from one culture are allowed to do can be prohibited in another culture. Moran, Abramson, and Moran (2014) discuss cultural differences in several dimensions, e.g. dress and appearance, relationships, values, standards, and so on. In terms of food and eating habits, they suggest that “the manner in which food is selected, prepared, presented, and eaten often differs by culture ... Americans love beef, yet it is forbidden to Hindus, while the forbidden food in Muslim and Jewish culture is pork, eaten extensively by the Chinese and others” (Moran et al., 2014: 12). Therefore, understanding others’ cultures helps to overcome cultural difference and helps to maintain harmonious relationships.

Culture is defined as the knowledge, customs and language a group of people share, and it is formed over many generations (Kittler, Sucher, & Nelms, 2011). Culture is passed on from generation to generation through socialization. Understanding the culture of others is very important in today’s global society. It helps to maintain harmonious relations and is good for the cultural, technological, economic, and political welfare of every nation (Bartell, 2003; Bernáld, Cajander, Daniels, & Laxer, 2011). It is therefore vital for educators to teach learners to understand and value the culture of others so that they can interact effectively and comfortably in a world characterized by close multi-faceted relationships and permeable borders (Huang, Chen, & Mo, 2015). Furthermore, learners need to amass a certain level of global competence to understand the world they live in and how they fit into it.

Cultural convergence theory explains cross-cultural understanding (Gudykunst, Ting-Toomey, & Chua, 1988; Kincaid, 1979). According to this theory, cross-cultural understanding takes place through the communication and information exchange of two or more learners from different cultures when they reach a mutual understanding of each other’s culture and the world in which they live. That is, experiences and insights of other cultures that learners communicate and share among themselves enable the expanding of their cultural awareness and behavior (Gudykunst et al., 1988; Kincaid, 1979).

In cross-cultural learning, learners acquire knowledge and skills related to different cultures, and they also absorb new attitudes and values as a result of this experience and participation (Yamazaki & Kayes, 2004). Traditionally, cross-cultural education in school is based on textbooks and an instructor’s knowledge and experiences. However, neither source can provide a thorough and authentic cross-cultural education for two main reasons (Bloom & Johnston, 2010). Firstly, textbooks are often biased and mostly present the views of the dominant class. Secondly, teachers may be biased towards other cultures, or they may have only limited cross-cultural knowledge and experience. Therefore, Bloom and Johnston (2010) and Yamazaki and Kayes (2004) argue that cross-cultural programs need to be administered as united, connected events, and as a knowledge-building continuum. The following essential learning behaviors are underlined in related literature as leading to cross-cultural understanding and are points that educators and researchers need to emphasize in the cross-cultural learning process (Yamazaki & Kayes, 2004): (a) building relationships – interacting with others regularly, particularly with members of the host culture; (b) valuing people of different cultures – expressing interest and respect for the host culture, including its history, customs, and beliefs; (c) listening and observing – spending time observing, reading about, and studying the host culture, particularly with members of the host culture; (d) coping with ambiguity – understanding ambiguous situations and making sense of new experiences; (e) translating complex information – translating personal thoughts into the language of the host culture.

To facilitate these essential behaviors, various learning activities have been proposed in the literature. *Self-introduction* is one activity that enables learners to become acquainted with one another and with other cultures (Liu, 2007; Tu, 2004). According to Curtis and Lawson (2001), this activity reinforces the comfort level in a classroom and encourages more social interaction among learners. Self-introduction helps learners to identify and examine their own cultural values and those of their peers (Chase, Macfadyen, Reeder, & Roche, 2002). *Creating media content and sharing it with others* is another activity. This enables peer-to-peer learning, diversification of cultural expression, more empowered cross-cultural understanding, and respect for multiple perspectives across diverse communities (Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009). In addition, learners are able to discern important concepts from shared content and then synthesize them with information from other sources during this activity (Jenkins et al., 2009). *Performance and appropriation* activities enable learners to adopt alternative identities and sample and remix media content meaningfully for the purpose of improvisation and discovery (Jenkins et al., 2009). Through performance and appropriation, learners from various cultures can introduce their own culture, share their ideas, artifacts and perspectives, as well as experience their peers’ foreign culture (Bloom & Johnston, 2010). Finally, a *reflecting on foreign culture* activity enables learners to share their reflections and experiences with peers. This activity also allows learners to gain a better cross-cultural understanding and an understanding of the strengths and weaknesses of cross-cultural learning activities (Tu, 2004).

Cooking is defined as the preparation of food for consumption by the use of heat (Katz & Weaver, 2003). According to Kittler et al. (2011), cooking tends to be associated with a specific culture, environment, and history, and as a result, each culture’s culinary approach is distinctive in terms of ingredients, methods, and dishes. Cusack (2000: 207) argues that “every

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