

## **Information and communication technologies to develop teachers' global awareness**

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### **ABSTRACT**

This project explored uses of information and communication technologies (ICTs), such as wikis, blogs, and e-mail to facilitate knowledge exchange between in-service teachers in New York City and in-service teachers in Taipei, Taiwan. The project purposes were (1) to increase participants' awareness of international cultures in an educational context (2) to enhance cross-cultural interaction between the two countries, and (3) to provide participants opportunities to use ICT tools. The findings show that both groups of participants gained important perspectives on global education, increased knowledge of each other's culture and its impact on education, and increased competence with ICTs. Participants also demonstrate the ability to develop strategies to add global dimensions to the curriculum and instruction.

**Keywords:** *ICT, blog, wikis, teacher education, globalization*

### **PURPOSES OF STUDY**

In 2003, the Pew Research Center for the People and the Press released a report outlining the need to prepare students to be effective citizens in a global society and to create a learning environment for developing global awareness and attitudes. The importance of nurturing teachers' global awareness as teacher educators compelled this investigation of information and communication technologies (ICTs) to facilitate communication and knowledge exchange between in-service teachers in two cities, New York, United States, and Taipei, Taiwan. Both the United States and Taiwan have attained high levels of computer and Internet access, thus access to technology was not considered a barrier to the anticipated outcomes of project. In the United States in 2004, 749 of every 1000 people own computers; 69.7% have experience using the Internet; 99% of public schools are connected to the Internet (World Bank, 2006, p.304). In Taiwan in 2006, 816 of every 1000 people own computers; 67% have experience using the Internet (Information, Communication and Space Technology, 2006, p.30) and 100% of schools are connected to the Internet (Wang, 2002). The well-constructed infrastructures in the two countries allowed the project focus to be on the design of curriculum rather than on access to technology.

What is globalization? Globalization is the trend that the world is getting smaller due to the widespread of information exchange and increased cross-cultural contact through the facilitation of computer network (Herring, 2001, p. vii). *Globalization* encompasses social, political, economic, ecological, cultural and informational dimensions. This paper focused on the *informational* and *cultural* dimensions. ICT tools were used as a medium for delivery to increase information flow between geographically distant locations to demonstrate global connectedness. The anticipated results were an increased understanding and sharing of educational perspectives

and resources. The content focused on a greater international cultural exchange which facilitated the cross-cultural understanding of the social system, specifically educational contexts, between the two countries.

Among the many ICT tools, we selected blogs, e-mail, and wikis, to develop participants' global awareness through collaboration and information exchange between the two cities. These tools reduced the distance among the participants and provided them reciprocal mode of communication and interaction. These ICT tools share similar features. They are affordable, easy to use, compatible with multimedia format files, and enable interaction. In addition, information on the blogs and wikis are achievable. Blogs allow the instructors to invite participants from multiple sites, to categorize information, and to publicize or hide the blog if privacy is an issue (Wang & Hsu, in press). The purposes of the study were (1) to increase participants' awareness of the greater international cultures in an educational context, (2) to enhance cross-cultural interaction between the two countries, and (3) to provide participants opportunities to use ICT tools.

## LITERATURE REVIEW

Ronald Robertson (1992), a key researcher in the field of globalization, defines the term *globalization* as "both the compression of the world and the intensification of the consciousness of the world as a whole" (p. 8). This definition is manifested through daily communication on the information highway. It is through intellectual exchange that people explore global perspectives. Teacher educators have sought ways to provide opportunities to increase teachers' global and multicultural awareness. Many efforts were launched to connect learners with people from other countries through telephone or television before computer network technology became prevalent (Boston et al., 1991; Galvin, 1989).

The advancement of network technology provides new opportunities to interact with people from the other side of the world. New ICT tools provide a channel through which teachers can enrich their global awareness, which, in turn, strengthens teachers' design of effective learning environments (Smith & Doyle, 2002). ICTs play an important role in this study to create authentic experiences for interacting with educators from another country, and to facilitate access, development and sharing of global educational resources. Thus, ICTs serve as an equalizer to increase access to education on a global scale (Davis, 1999). Therefore, this study used ICTs to facilitate interaction between two groups of teachers and provide experiences to increase their global awareness.

Globalization is critical to the future of the world to expand an understanding of citizenship and thus develop a sense of obligation to a global community (Kubow & Crawford, 2001). Global issues are interdependent concerns common to citizens of every country. Many American citizens—especially those who have neither lived nor traveled extensively in other countries—lack knowledge of the realities in other parts of the world and therefore have fewer opportunities to compare and contrast or even consider perspectives of others (Brown & Kysilka, 2002). Educators and policymakers need to stress global perspectives in the classroom to heighten awareness of global issues and responsibilities (Diaz et al., 1999). Teachers should be informed citizens aware of international concerns and controversies and participants in global society, so that they can prepare their students for global citizenship. Since the late 1970s educators and policymakers have advocated for American schools to prepare students to face the challenges of globalization and its impact on our society. However, very little improvement of students' global awareness (e.g. geography, world history, language) has resulted and the programs reach few students, teachers and schools (Smith, 2002).

In response to the increasing need to have students build understanding and tolerance for people

from various countries and cultures, National Council for the Social Studies has established a curriculum standard that “social studies programs should include experiences that provide for the study of global connections and interdependence” (NCSS, 1994). The effect of globalization translates into a movement from national curricula to global curricula that stresses world citizenship, as suggested in *Educating World Citizens: Toward Multinational Curriculum Development* (Parker, Ninomiya, & Cogan, 1999) and on websites such as *Globalization 101.org*, sponsored by the Carnegie Endowment for International Peace.

Several research studies have introduced teachers to the concepts of globalization through technology. For example, using online forums to facilitate discussion among teachers around the world (Gibson, 2005); using email to facilitate communication among pre-service teachers from different cultures (Sernak & Wolfe, 1998); and using asynchronous computer conferencing and videoconferencing technology to support teachers and students' collaboration and communication (Good et al, 2005; Sandy, 1996). Abbott and others (2004) proposed a study to use ICTs to facilitate collaboration of students in ten special schools in Northern Ireland and the Republic of Ireland. The results stressed the importance demanding ICT skills for today's graduates.

To be competitive in the job market, graduates must be effective problem solvers and have superb information literacy skills. Digital literacy refer to skills in using new ICTs to identify important problems, gather relevant critical information, access appropriate information for problem solving, and communicate solutions clearly throughout an organization (Leu et al, 2005, p. 152). In short, having skills in ICTs and access to the appropriate media can enable individuals to affect world views. As Leach (2005) suggested, ICT should be viewed as “an essential aspect of teaching's culture toolkit in the 21<sup>st</sup> century, affording new and transformative models of development that extends the nature and reach of teacher learning wherever it takes place” (p. 293).

Many teacher educators have embraced the Internet for collaboration, communication, and research. Tools such as e-mail, discussion forums, and chat rooms are quite familiar to most teachers. More recently, blogs and wikis have emerged and offer great potential for online collaboration (Godwin-Jones, 2003). The expansion of the learning community requires respect for diversity, including inter-cultural education, and equitable access to electronic learning resources. The concept of ICTs have thus evolved and created a challenge for K-12 curriculum (Karchmer, Mallette, Kara-Soteriou, & Leu, 2005).

Addressing the increasing speed, volume, and complexity of global interconnectedness, Cogburn (1998) discusses the implications of globalization for knowledge and education. He identifies various ICTs to consider for critical thinking, acquisition and analysis of information, teamwork, and communication skills. ICTs support communication *between* learning groups and *beyond* classrooms. The classroom teacher's role is *facilitator* of collaboration with local and global communities. Teachers need to develop competencies in networking and collaboration essential to using ICTs in education (UNESCO, 2002). Although teacher educators agree that ICT skills are important to our teachers and students, Simes and Priestley (2005) concluded that the use of ICTs is relatively low and there is a need to explore broader applications in teacher education.

## PROJECT CURRICULUM DESIGN

Globalization is a complex concept and, in general, is difficult to infuse into curriculum. Typically it is embedded in the social studies methods courses in teacher education programs. Therefore, this project adapted the approach suggested by Davis (1999) to use ICTs to establish access to learning and collaboration on a broad range of global issues. To increase participants' global awareness, both the New York and Taipei groups of teachers engaged in the inquiry process in

the following dimensions: (1) *informational* to understand the importance of ICTs, apply them to increase the information flow between geographically remote locations, and share educational accesses and resources; and (2) *cultural* to facilitate the greater international cultural exchange, which facilitated the cross-cultural understanding of social system between the two countries, specifically in educational contexts.

Using a social-constructivist approach, participants explored their understandings, beliefs, and values about globalization and its effect on society, on themselves and on their teaching. The framework proposed by Merryfield (1997) in her article "*Preparing teachers to teach global perspectives*" was applied in designing the activities. The tenets of this framework are: human beliefs and values, global systems, global issues and problems, global history, cross-cultural understanding and interaction, awareness of human choices, development of analytical and evaluative skills, and strategies for participation and involvement. The anticipated outcomes of the project were that participants would develop ICT skills, increase understanding of different cultures, and reflect upon the educational needs to prepare students for acquiring 21st century skills. In addition, the researchers established and tested a model for using ICTs to facilitate interaction of teachers from different countries.

### **Project Goal and Objectives**

The goal of this study was to develop teachers' global awareness through ICTs. Upon completion of the study, participants were able to apply ICT skills to attain global perspectives and were aware of the educational system and learning culture of the partner city. They acquired knowledge and skills for relevant global concept connections beyond the classroom and strategies for infusing global perspectives into the curriculum design for K-12 students. Five major activities were designed for this project as described below. A group blog was established for project management and for participants from both countries to interact and communicate with each other.

#### *Activity 1. Become aware of the culture of the partner country.*

This activity introduced the global connection activities of the project. The activity included providing information about location of the partner site on a wiki without revealing the identity of the city. Participants worked collaboratively to generate and post "clues" on the wiki page that conveyed distinctive features of their home city so that the other group could figure out the city through online research (see Appendix A for complete lesson plan). During the process to develop clues, participants had to research the characteristics and features of their residential area. When researching the city of the other group of teachers, participants became more aware of the particularity of the other city and its cultural. The clues generated by both groups can be viewed at, [http://globalgrouptmue.pbwiki.com/global\\_1](http://globalgrouptmue.pbwiki.com/global_1) and at <http://globalgroup615.pbwiki.com/>.

#### *Activity 2. Personal introductions.*

Participants were randomly paired as e-pals and used e-mail to discuss assigned topics regarding their culture, customs and teaching career.

#### *Activity 3. Life map.*

Participants were expected to discuss the global impact of their own life. Participant created a graphical representation of their "life map" to post on the group blog for sharing life events such as, family, education, and travel experiences. Participants were able to observe the connections and similarities with each other lives and career paths.

*Activity 4. Discussion forum: Global perspectives on education.*

Participants researched educational issues, posted their findings on the group blog, and engaged in discussion with other participants. The following topics were assigned: (a) the education system P-12 in the state of New York (or the city of Taipei); (b) preparation for cross-cultural and intercultural learning in teacher education programs in the United States and in Taiwan?; (c) teacher preparation to teach students from diverse backgrounds? (d) perspectives on bilingual education in New York and Taipei?

*Activity 5. Application of global concepts beyond the classroom.*

As a culminating project activity, participants designed a lesson unit incorporating global dimensions in their content area. Participants were evaluated using an assessment rubric that focused on the application of global concepts in the lesson plan. Central to the project evaluation was participants' use of ICT skills to enhance students' global awareness and crucial components on 1) global issues or greater international cross-cultural differences, 2) use of ICT skills to establish global connection and communication, and 3) use of ICT tools to research global concepts and perspectives.

**RESEARCH DESIGN**

To triangulate the findings, this study adopted a mixed-method (Tashakkori & Teddlie, 1998) approach that consists of qualitative (open-ended questions and dialogue analyses) data and quantitative (surveys) data. The three guiding research questions were:

1. How does participating in this activity affect participants' from both countries global awareness and beliefs about infusing globalization into curriculum and instruction?
2. How does use of ICTs affect participants' from both countries willingness and attitude to infuse globalization in the classroom?
3. What is the role of ICTs for online collaboration between the two groups?

**Background of Teacher Education Programs**

Participants in the study were graduate students in an in-service instructional technology master's program teacher education program in New York. Most candidates were certified teachers in metropolitan New York City schools seeking New York Educational Technology Specialist certification. The New York State Department of Education requires that graduates of this master's program have instruction integrating technology into each of the core content areas: language arts, social studies, mathematics, and science. This project was a component of the curriculum for the language arts course, and in this regard, the related activities feature concepts of the *new literacies*, defined as the knowledge and skills that underlie the use of ICTs.

The Taiwan-based participants were students in a continuing education program in the Graduate School of Curriculum and Instruction. The goals of the Ministry of Education of Taiwan are to establish a first-class information-education environment, to provide ICT application training for teachers and students, to develop ICT applications for teaching, and to include ICTs instruction in software design (MOE, 2006). The university is charged with implementing the MOE goals in their teacher preparation programs.

## Participants

Twelve participants from the Instructional Technology master's program in New York were enrolled in *Language Arts and Technology*. Eight participants from the Education Curriculum and Instruction graduate program in Taipei were enrolled in a course called *Topics in E-Learning*. Two instructors were responsible for facilitating discussion and providing guidelines and instructions and two other faculty researchers were responsible for the research design, development of the activities and instruments, and data collection and analysis.

## Procedures

The curriculum was implemented using a group blog to enable participants to exchange ideas about ways to better prepare their students for global citizenship. During the two-month period, participants discussed topics related to global aspects of educational issues. Specific topics embedded in the curriculum included the knowledge and the culture of each city, personal global connections, participants' similarities and differences, and the educational systems in each country.

## Data Sources

Data were from the following sources:

- Pre and post attitude survey and interviews were designed based on previous studies to measure helpfulness, interest level, ease of use, adequacy of information, and levels of enjoyment and engagement (Browns and Kysilka, 2002; Diaz, 1999; Pew Research Center, 2003).
- Participants' responses on wiki, e-mail, life map, and blog for frequency of communication and quality of responses.
- Open-ended questions to probe aspects of participants' online-learning experiences.

## Data Analysis

Descriptive analysis was applied for determining the means and the standard deviation of the survey responses. Paired t-test was used to compare the pre and the post survey data to capture the change of participants' global awareness. The analysis of the open-ended responses follows Miles and Huberman's (1994) analysis model for identifying themes from open-ended questions and revising results on the basis of member checking.

## FINDINGS

The findings are organized under three categories: pre and post survey, participants' open-ended questions and instructors' interviews.

### Pre and Post Survey

A paired t-test was used to test participants' attitude changes before and after their participation. Significant differences resulted in four areas: (1) participants' understanding of the concept of

globalization and globalization's importance to the participants' country; (2) how globalization impacts the participants' own country and other countries; (3) participants' perceptions of need for more preparation and instruction in how to teach globalization; and (4) participants' increased confidence in his/her ability to design instructional materials related to globalization.

**Table 2:** Pre and post paired t-test results for participants' perception toward globalization (N=20)

Questions	Pretest		Post-test		t(17)
	M	SD	M	SD	
Children and education are the most important problems facing our country today.	3.56	1.54	4.22	0.88	-1.94
Values are disintegrating in today's society.	4.11	1.13	4.22	0.94	-.35
Religious, racial and ethnic hatred are major problems in the world	4.11	0.96	3.94	0.87	.59
There is a growing gap between the rich and poor in our country.	4.28	0.83	4.44	0.62	-.90
Illiteracy is the most pervasive problem for determining our global future.	3.61	1.09	3.39	0.78	.89
When today's children grow up they will be better off than people are now.	2.56	0.92	2.39	0.70	.825
Schools are doing a good job to prepare our children for becoming global citizens.	2.44	0.78	2.22	0.65	1.17
Our education systems are adequate for preparing students for future work force.	2.44	0.92	2.22	0.81	1.07
Availability of movies, TV and music from different parts of the world helps understanding other people.	4.11	0.90	4.10	0.42	.251
Children need to learn English to succeed in the world today.	4.0	0.91	4.06	0.80	-.29
Faster communication and greater travel between the people of our country and people in other countries improve our understanding of globalization issues.	4.17	0.38	4.01	0.73	.70
Globalization is important to the future of our country.	4.44	0.62	4.22	0.73	1.46
I infuse globalization educational materials into my teaching.	3.22	0.81	3.67	0.69	-2.05
<b>I understand more about the concept of globalization and its importance to our country.</b>	<b>3.61</b>	<b>0.70</b>	<b>3.94</b>	<b>0.73</b>	<b>-2.38*</b>
<b>I understand how globalization impacts our country and other countries.</b>	<b>3.56</b>	<b>0.70</b>	<b>4.06</b>	<b>0.56</b>	<b>-3.04*</b>
I understand how globalization affects business and education in my country.	3.83	0.79	4.17	0.51	-1.68
Helping our children to become aware of globalization will prepare our country for the future.	4.33	0.69	4.06	0.56	1.29
Communicating with a group of teachers from another country is helpful to understand and practice the idea of globalization.	4.22	0.55	4.00	0.59	1.17
I provide opportunities to help my students interact with people in other parts of the world.	2.78	1.26	2.50	0.99	.84
<b>My teacher preparation program has provided sufficient training to help me teach globalization in the classroom.</b>	<b>2.44</b>	<b>1.04</b>	<b>3.22</b>	<b>0.88</b>	<b>-2.72*</b>

Questions	Pretest		Post-test		t(17)
	M	SD	M	SD	
<b>I do not know how to design instructional materials to help my students understand globalization.</b>	<b>2.82</b>	<b>0.73</b>	<b>2.28</b>	<b>0.67</b>	<b>2.50*</b>
Using English language to exchange ideas and experiences online is a barrier for those who are not native English speakers.	3.71	0.69	4.11	0.90	-1.95
I read books or articles to increase my understanding of and sensitivity to the global issues (e.g. environment, human rights).	3.82	0.81	3.94	0.80	-.62
I rarely know about international events and recognize their importance in our lives.	2.30	0.92	2.17	0.99	.846
I use materials that address global issues, such as literacy, racial, ethnicity and cultural diversity.	3.36	1.06	3.72	0.83	-1.00
I use my colleagues' expertise to extend my own knowledge of and skills in global concepts.	3.24	0.83	3.56	1.10	-.89
I stress the interdependence of nations and people around the world, relating world events to our community.	3.36	0.93	3.78	0.88	-1.69
I never access community (e.g. library, museum) resources in developing multicultural and global activities.	2.41	1.00	2.00	0.84	1.14
I have the professional training needed to work effectively with people from diverse cultural backgrounds.	3.24	0.83	3.35	0.79	-.20
I am conscious of cultural differences when communicating with people of other cultural groups.	4.12	0.60	4.22	0.55	-.70
I know where to obtain global materials that are free of racial or cultural bias for use in my classroom.	3.23	1.10	3.67	0.84	-1.95
I rarely or never bring in extra materials to supplement global concepts in the curriculum.	2.41	0.94	2.33	0.77	.29

Average of Likert-scale responses, 1=strongly disagree, 5=strongly agree

Due to the small sample, the result of the statistical analysis cannot be generalized; however it provides a trend of participants' change in attitude. Qualitative data were collected and analyzed to triangulate the survey findings.

### Open-ended Questions

The following themes were manifested by participants' responses to open-ended questions:

- a. Awareness of similarities and differences among teachers in another country: Both of the groups acknowledged that they had little or no knowledge about the other group's country before participation. This project helped develop their awareness of the differences and similarities characterizing the viewpoints of each group on educational and globalization issues. To their surprise, the two groups often had similar views on education. The two groups believed that globalization is important and wanted to know more about each other's approaches.

- b. Consideration of the possibility of working with another group of teachers: Experience with ICTs encouraged participants to realize how easy it is to communicate with people in another city or country. Some participants indicated they would consider continuing working with teachers from the other group to increase their own students' opportunities to become global citizens. The authentic experience of communicating with people from another culture increased and renewed the participants' interests in global education.
- c. Impact on teaching: This project increased participants' awareness of the importance of global education. They indicated that they are now more apt to consider integrating globalization into their curriculum. The project gave the participants ideas about how to design or locate instructional resources for globalization. Under the stress of test preparation, participants pointed out that they should spend more time helping students know more about globalization rather than consume the whole day with reading and math. The participants reported that they would consider the use of ICTs in their teaching, and suggested many ways to use ICTs in their future classroom. For example, they discussed the possibility of students communicating with students from another country using e-mail for an e-pal activity. The impact on teaching was also manifested through the lesson plan design. For example, one unit addressed marine biology concepts by comparing a country on the Atlantic Ocean with a country on the Pacific Ocean. Another participants' unit compared frogs from different regions of each country. A participant compared the music and musical instruments from different countries. Participants also discussed human rights in a democratic society compared to those in a communist society.
- d. Perception of using ICTs: Blog, wiki, and email were the major ICTs adopted for this project. The project resulted in participants understanding the ease of establishing a blog, the compatibility of the multimedia, and the ability to connect users beyond one's own classroom. Many participants reported that using wikis for collaborating is fun, easy and effective. They especially liked the wiki feature that allowed them to revise information posted by others. They believed ICT tools should be introduced to their students, and had confidence to adopt these ICTs in their classroom. A few participants suggested using Skype (real-time Internet phone) in future projects.
- e. Other: Language differences caused some confusion and frustration. The Taipei group spent more time posting assignments than did the New York group, whereas the New York group's discussions were more active than the Taipei group's corresponding discussions.

### **Instructors' Interviews**

Both instructors pointed out that their teacher education program should provide candidates with more instruction to increase awareness of the importance of globalization and strategies for incorporating global perspectives into the curriculum. The two instructors enjoyed the participants' creativity.

From the instructors' perspective, the e-pal activity was the least successful activity because of the language issue. The majority of participants never used blog nor wiki page before; however they were comfortable of using these ICT tools after several attempts. They could successfully use blog to post articles, embed graphics and links, and interact with other participants through commenting feature. Also most of the participants could use wiki page to collaboratively devise a document. Some of them reported these ICT tools are very easy to use so they can immediately adopt them in their classrooms. Still, a few participants' lack of familiarity with ICTs hindered their successful implementation of some activities. The instructors suggested that participants should be provided with more tutorials to assist their proficiency in the use of ICTs, more structure and guidance to assist their activity management, and more English teachers as group facilitators to

support participants lacking sufficient English proficiency.

The instructors suggested that an integration of various ICT tools in globalization activities is needed. This project indeed helped the participants expand their views on the global community, encouraged them to integrate global dimensions into their teaching and curriculum and increased skills with ICTs for international collaboration.

## **DISCUSSION**

This project used ICT tools to increase the cross-cultural contact within a social system between in-service teachers from Taipei and New York. After participating in the project, their understanding of globalization and the confidence to infuse globalization into curriculum were improved. Although few participants encountered technical difficulties, participants believed that they need to attain more ICT skills and introduce ICTs to their students. This project exemplifies how ICTs can be used to share information and resources and increase cultural understanding. The wikis and blogs were useful for the collaboration between groups of participants, whereas, e-mail was less effective, and synchronous communication tools could not be used. The role of the blog is similar to a courseware management system (e.g. Blackboard), which serves as a platform for all participants to interact among one another. Moreover, blog connects people from different class sections and from various countries. It is an ideal tool to connect people on the Internet and allows participants to express their ideas through multimedia elements (text, graphics, and video). Wikis enable online collaboration among multiple participants. Participants can contribute and revise information posted on the wiki page without spending time exchanging document. The wiki page can record all participants' contribution so it is easier for the instructor to monitor individual's contribution on this document. The e-mail activity was less effective mostly due to the language barrier. Participants from Taiwan were inclined to communicate on the blog as opposed to use E-mail, which they perceived as an extra burden due to heavy translation.

The ICTs bridged gaps that separated the two groups of participants from each other and facilitated the professional partnership between two universities. ICTs based activities increased participants' confidence in classroom-based ICTs use. They found common interest and concerns about their teaching and enjoyed sharing ideas for implementing globalization instruction. Some were motivated to attempt globalization projects after the project ended. In this study, ICTs played the role to support 3C skills proposed by Baumgartner (1999): global communication, co-operation and collaboration allowing participants to expand their connections beyond their geographical boundaries.

This study provides a preliminary model for using ICTs for interacting with teachers from another city. This model will be applied for subsequent study of additional ICTs and global issues. A longitudinal study would provide data regarding transfer to the classroom and the impact on K-12 students. Additional partners from other countries will be sought to expand participation to contribute to conclusions of effective applications.

### **Difficulties and Challenges**

Several challenges hindered the participants' ICT-based interactions.

- a. Language barrier: English is not the official language in Taiwan. Although most of the Taiwanese participants received English instruction at an early age, they were not sufficiently proficient to use the second language in complicated written discussion. They needed more time to translate messages in English, which delayed responses and inhibited

participants' willingness to participate in the discussions.

- b. Time difference: The researchers planned to implement an online synchronous chat activity; however the twelve-hour time difference made it impossible to find a mutually convenient time slot for any synchronous activities in both venues.
- c. Technology challenges: Although most participants use productivity tools such as word processors and spreadsheets and browse information on the Internet on a daily basis, few had experience using ICTs such as blogs or wikis. Almost half the participants were over 40 years old, and many reported that they had never before used web-based tools for communication other than e-mail. Moreover, New York the course was conducted totally online, so it was very difficult to immediately assist participants in resolving technical problems.

### Recommendations for Teacher Educators

Connecting learners with people outside the classroom is difficult, let alone people from another country. The researchers have several suggestions for future teacher educators who may plan a similar project to use ICTs to facilitate collaboration and communication among multiple groups online:

1. Develop strategies to increase the sense of a virtual learning community. The instructors should create an atmosphere of trust and openness to ensure the success of the online environment. In this study, the first "guess the city" wiki page activity indeed aroused participants' curiosity toward another culture and motivated them to continue participating in the project. The successful initial social exchange was vital to forming an online community. The following e-pal activity also fostered the communication and developed rapport among participants. In addition to the blog, instructors could use both synchronous and asynchronous methods to enhance participants' sense of a virtual community. Use of video e-mail or Voice-over-IP tools (e.g. Skype) may help participants sense the existence of the other members. Collaborating with participants in the same or nearby time zone may be a better choice if synchronous communication tools are adopted.
2. Design instructional materials that support participants' use of the ICT tools for collaboration. The instruction could include streaming video instructions using screen-capture tools, such as *Snag It* or *Captivate*, to teach hands-on skills. Video e-mail could be used as short verbal descriptions and visuals of directions and supplementary information.
3. Explore ways that reduce the language barrier between the groups. Use simple English to exchange opinions. Language barriers cannot be resolved in a short period of time but it is important to use simple expressions, visual support, various digital media, and translation programs. These can facilitate communication and the exchange of ideas. In future studies, pair participants who are technologically and linguistically savvy to facilitate technology literacy, language proficiency and mentor others who have little confidence with technology or with a second language.
4. Establish partnerships with countries or cities that have similar technology infrastructure and resources. Immediate interaction or fast feedback is the key to the success of an online community. The lack of appropriate support (hardware, software, training) may hinder the interaction and put-off participants' interest and momentum.
5. Advocate for teacher education programs to introduce and infuse ICTs in the curriculum to prepare teachers for the 21<sup>st</sup> century by adding a global dimension (Davis, 1999) to the teachers' professional development. Teachers should be equipped with ICT skills and have positive attitudes for incorporating globalization into their classroom.

### EDUCATIONAL IMPORTANCE

It is important that we prepare young people for global communication and collaboration and in doing so, it is necessary to prepare our teachers in the use of related tools and knowledge of globalization concepts. Globalization, an inevitable trend everywhere in the world, is an idea that must be practiced and implemented in the 21<sup>st</sup>-century classroom. With the assistance of online technologies, global connections are possible and indeed necessary. It is expected that more and more organizations will create connections with different countries in the future. The major contributions of this project are twofold: (1) provided a model for ICT-based instructional activities to improve participants' knowledge and willingness to use ICTs and (2) developed and tested a model to use ICTs to facilitate participants' understandings and beliefs about global awareness.

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**Appendix A.****Guess the city wiki page activity lesson plan**

\*\*This is a collaborative activity between multiple cities.

**Objectives:**

1. Learners will be able to use collaborative online editing tool to create a document.
2. Learners will be able to use online researching tool to collect information about their home country and generate a list of its features.
3. Learners will be able to use online researching tool to analyze information and generalize result.

**Procedure:**

The instructors should create one project blog to allow students to discuss the findings. Do not reveal partner city's identity.

1. Assign your students to create a wiki page account.
2. Create the city clue wiki page and invite students to edit it. The clues should not be too easy or too difficult.  
Sample clues wiki page:
  - [http://globalgrouptmue.pbwiki.com/global\\_1](http://globalgrouptmue.pbwiki.com/global_1)
  - <http://globalgroup615.pbwiki.com/>
3. Students have one week to generate clue on the wiki page, and then share the result with the students from other city.
4. Students should use online researching tool (e.g. Google) to analyze the clues generated by the participants from another city and then determine the city.
5. Students should post their findings on the project blog and describe the process to figure out the answer.

**Assessment:**

Design a rubric for assessing the wiki page and distribute to the participants before they begin creating the wiki page. The rubric should assess their contribution to the clues, the quality of the clues, and the collaboration with other participants.

<b>Criteria</b>	<b>Unacceptable</b>	<b>Acceptable</b>	<b>Exemplary</b>
<b>Contribution</b>	No participation in the writing of wiki page	Participation in the writing of wiki page	Active participation in the writing of wiki page adding multimedia format files
<b>Quality of clues</b>	Clues generated were too simple or too difficult. Clues generated did not reflect locality features	Clues generated were appropriate and reflected proper locality features	Clues generated were appropriate and reflected distinct locality features
<b>Collaboration</b>	Did not evaluate clues generated by	Evaluated clues generated by peers	Actively evaluated clues generated by

<b>Criteria</b>	<b>Unacceptable</b>	<b>Acceptable</b>	<b>Exemplary</b>
	peers and did not improve the quality of clues	and improved the quality of clues	peers and improved the quality of clues
<b>Guess</b>	Did not guess the city	Guessed the city without providing the rationale for the answer	Guessed the city with the rationale for the answer
<b>Mechanics</b>	Errors in grammar and punctuation, but spelling has been proofread.	Occasional grammatical errors. Spelling has been proofread.	Nearly error-free. Reflects thorough proofreading for grammar and spelling.

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