

Two Screens and an Ocean: Collaborating Across Continents and Cultures with Web-Based Tools

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Abstract

This paper describes the implementation and results of a cross-cultural pairing between college students in the United States and Romania who worked together over the period of one month to create a multimedia presentation that shared their learning about topics of multimedia and culture. Students could use any web-based collaboration tools of their choice, including email, instant messaging, voice and video conferencing to complete the project, and documented their results on a collaborative wiki. The project gave students an opportunity to use Web based collaboration tools to create tangible work products with international partners. This paper presents an analysis of the technologies they used and how they used them to complete the project, and examines their learning based a survey and their own qualitative remarks. Results show that students gained proficiency at selecting and using appropriate web based collaboration tools. They also overcame issues related to language, time zones and technology.

Keywords: Web 2.0, Computer Literacy, Collaboration Tools, Web Literacy, Collaborative Learning, cross-cultural learning.

1. INTRODUCTION

This paper describes a collaborative project between students at One University from United States and students from Two University from Romania. This work follows the research on the multicultural aspects of working and studying internationally extends the work on characteristics of digital students (Andone, Dron et al., 2007) and their participation in an online multicultural education environment (Chan, Frydenberg, & Lee, 2007).

The purpose of the project was to provide students with a real-world experience of using web-based collaboration tools to develop information technology and web 2.0 literacy skills. In addition, students' researched topics of interest related to the use of technology in their own countries, and shared their findings with each other, in order to promote cross-cultural awareness.

Their instructors were interested in studying the students' choices of technologies, their attitudes toward using them, and challenges

they faced while collaborating with international partners. Those aims guided the research questions for this study:

- How does participating in an international collaborative environment for learning change students' perspective over their subject of study (multimedia and internet technologies)?
- How will students use Web-based synchronous and asynchronous technologies to collaborate with international peers in order to create a tangible work product in a short amount of time?
- What technical and cultural challenges will students identify in working globally, and how will they overcome them?

Students Today

Digital students use technology in every part of their lives. Among the characteristics that define digital students are that they take the availability of email, instant messaging and text messaging for granted, and assume unlimited online resources (Tapscott, 2008). The digital world has had a significant impact on their habits and behavior (Palfrey & Gasser, 2008). "Today's technology allows a perpetual connection to peers, leaving little time for autonomy" (Tyler 2007, p. 1). They tend to use the search engines to search both for formal educational purposes and for information about their hobbies and interests. They use SMS (mobile text messaging) extensively for contacting their friends and colleagues, as well as IM (instant messaging).

Our results show that the use of multiple media and technologies is directly connected to their use in informal educational settings (Andone, 2008), yet students need to learn more about these technologies and applications in order to fully take advantage of them (Shannon, 2008). Gasson, Agosto and Rozaklis (2008) found that today's students "show a lack of traditional information skills" and "rarely venture outside of their comfort zone when using technology", citing a constant use of Google for everything. A motivation for this exercise was to allow students to learn about several tools (IM, Skype, Mebeam video conferencing, wikis, blogs, Google Documents, Spreadsheets, and Presentations, and others) for their web-enabled communications toolbox, and create a learning space which required students to make decisions on which were

most appropriate to use given the task they were trying to accomplish.

Although technology use is a part of their daily routine, that does not imply that digital students use web based collaboration tools effectively. "Not only is it assumed that these students will have had broadly universal experiences, but that they will also have a sophisticated knowledge and understanding of information and communication technologies." (Kennedy, et al, 2008, p. 108). In their 2006 study of first-year college students' use of web-based collaboration technologies, Kennedy (2008) found that the majority of students at their Australian university have not used web-based collaboration tools such as video conferencing, wikis, and Skype. These are the very tools and technologies that students must learn in the information technology classroom.

Web literacy requires an understanding of the problem as well as the ability to select an appropriate tool to use to solve it. Building information literacy skills gives students an opportunity to develop best practices for using web based collaboration tools in a variety of contexts.

Learning across Cultures

Web 2.0 encompasses rich web applications that facilitate instant messaging, Voice Over IP Internet telephony, live video streaming and conferencing, and social networking within a web browser. In recent years, the advent of Web 2.0 tools for collaboration and communication (O'Reilly, 2005) has enabled both businesses and individuals to form global partnerships. "For the first time in human history, the potential exists for exponential growth in direct international interchange. It is an interchange that has the ability to heighten cultural awareness and provide opportunities for direct life applications of the knowledge gained by crossing traditional boundaries of nation, language, time and culture." (Gragert, 2000, p. 1) Since the end of the last century, email communication has been useful for several different cross-cultural conversations. Students of (Liaw & Johnson, 2001) exchanged email messages to improve their writing skills while learning English as a second language. In a later study, their students "read articles on topics of their own culture and communicate their responses with speakers of another culture" (Liaw, 2006, p. 59) using computer-mediated communication tools. Students communicated fluently, with lesser reliance on

online language tools as the project continued. The literature notes that an outcome of the online exchanges was also to foster awareness and curiosity about the other's culture as well.

Gragert (2000) remarked that the Internet provides "significant opportunity ... for human-to-human interactions, experiential learning and direct curriculum applications. Our students have the opportunity to both learn and teach through direct interaction. ... Students have the opportunity to observe, learn an address the serious global issues for which education is designed to prepare them as adults." In recent years, voice and video chat have become common Internet activities. These technologies facilitate the process of learning and teaching others on line. While the literature shows the use of computer mediated communication is common for learning and developing language skills, or speaking internationally with the intention of learning about another's culture, this study specifically focuses on gaining literacy with a number of web based tools for collaboration and communication. In a business context, the global marketplace demands that today's students (and tomorrow's information workers) will be well-versed in completing collaborative projects where participants are located across the planet. "IT [Information Technology] professionals are now faced with managing and working with personnel who they have never met before, who live in places they have never visited, and whose lifestyles and societies they know little about" (Chand, David, & Kumar, 2006, p. 1)

2. COLLABORATING ACROSS CONTINENTS

This paper extends the previous work of Chan, Frydenberg, & Lee (2007) who teamed students from their universities in the United States and Australia together to talk over Skype over a period of two weeks, recording their conversations on topics related to technology and culture. It describes a partnership between first year business students in IT 101, an introductory information technology course at University One in the United States, and Bachelor in Telecommunications students in the Technologies of Multimedia (TMM) course, in their final year at the "University Two in Romania. These students partnered over a period of one month in November and December, 2008, to explore a variety of web-based collaboration and communication tools to

create a multimedia presentation on a topic related to technology, and culture. Table

The special technology intensive section of IT 101 is offered as an alternative to the traditional introductory IT course required of all first year students at University One. The TMM course is a course for senior students at University Two that covers the development of new media and Internet technologies for communication. Prior to this project, students in both classes have accomplished similar technical tasks: they made personal web pages, posted online videos, and created PowerPoint presentations; they are web literate; they are familiar with social networking sites, search engines, email, instant messaging, and other applications. This project introduced many of them to Google Sites and applications (Documents and Presentations) as new collaboration tools that many had not used previously. Approximately 45 American and 30 Romanian students participated in the project, with five (three American and two Romanian) students per group. All of the Romanian students, who volunteered out of the 75 students enrolled in the TMM course, spoke English comfortably.

This project created an online environment which encouraged students to:

- identify and select appropriate web-based tools for communicating with international partners to accomplish a collaboration task
- work with students from another country (Romania and the USA) to create a multimedia presentation presenting their findings on a topic related to technology and culture

Students selected topics to share about blogs and podcasts they read, concerns about privacy in the age of Facebook, five most important web sites, and the impact of the Internet on politics in each student's country. They were free to present their findings in any digital format, from a PowerPoint or Google presentation to a web site with images, a video, recorded audio conversations, or a combination of any of these.

The instructors created a collaborative Google Site (facility wiki-like capability offered by Google) called **TalkTech2008** (located at <http://sites.google.com/site/talktech08>) to share information about the project with stu-

dents, and for students to share documents and files, and track their progress as they worked with other members of their groups. Use of the Google site created a shared environment for all the students to participate in this project. The authors chose an external site over either of their university's online course management environments but this proved to be an administrative challenge due to issues related to allowing outside students to an internal campus resource.

The instructors invited their students to the site as collaborators. The TalkTech200 site has an announcements page where either the students or the instructors could post announcements, a home page with a description of the project and related milestones, and a groups page, where students signed up for groups and selected topics. The instructors placed a Meeting planner gadget displaying the local time in both countries on several pages of the Google site, to remind students of the time difference (7 hours) when planning real time meetings with their international partners. Despite this, students still found managing time zone differences to be difficult. The instructors created a set of pages for each group, including a home page, a "Wall", and a File Cabinet. The "Wall", modeled after Facebook's wall, is a blog-like page where students can record their contributions to the project, or leave messages for their partners. Newer posts appear above older ones. The File Cabinet page served as a common online repository for students to share images, videos, presentations, and other files that they generated while working on this project. Students used their group's Home page to embed their multimedia presentation, or include links to references or other resources. Some groups simply provided hyperlinks to their final documents which were external files or websites.

Table 1, as published on the TalkTech2008 web site, summarizes the schedule and project milestones.

Week	Tasks
Nov 10	Sign up for a project topic and group. Introduce yourself to your partner(s) by email, or look for them on Facebook or IM. Schedule your first real-time conversation (audio or video) which should last between 15 and 20 minutes and take place by November 17. Test the communication software (Skype, Mebeam) with someone local to you so you know how to use it. Be sure you determine who will initiate the call.
Nov 17	Complete your first real-time conversation. Get to know a bit about your partners. Note any problems with the technologies you use. Discuss your project and deliverables. Will you create a video? a PowerPoint? Decide who's going to do what. Schedule your second meeting to take place before Nov. 24.
Nov 24	Complete your second online meeting. Focus on what you learned, and how you are going to present your findings online. American students will be celebrating Thanksgiving from Nov 26 to 28. No classes are held, and they may be offline for part of that time.
Dec 5	Your project should be complete and posted to your group's page on the TalkTech2008 site. In your conversation with your partners this week, talk about what you've done, and share any final thoughts about the project.

Table 1. Project Schedule and Milestones



Figure 1. TalkTech 2008. Students used the "groups" page to select topics and sign up for project groups.

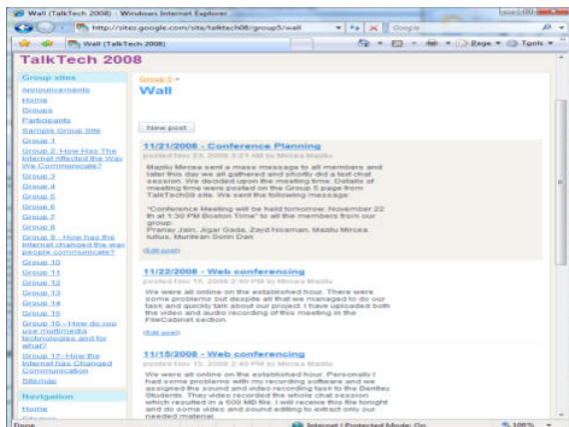


Figure 2. Group pages on the TalkTech2008 Google Site

Use of Web Based Collaboration Tools

Students had to communicate with their international partners at least twice (with conversations no more than one week apart) in real time using VOIP audio or video conferencing. They were free to choose the communication platforms; many chose Skype (skype.com) or Google Talk (Google Talk) for voice chat or text-based instant messaging; Google Talk or MeBeam (MeBeam.com) for live voice and video conferencing. To provide evidence of their online interaction, students recorded at least a portion of the audio or video (see groups 9, 12, 15), or posted the transcripts of their instant messenger conversations (see groups 1, 16) to the File Cabinet or Wall pages of their collaborative site. Students relied on other web-based computer mediated communication mechanisms (email, instant messaging, etc.) as needed (see groups 2, 4, 7, 8).

Instant messenger conversations focused on several areas: personal relationship building between partners (one user asks her partner by what name she prefers to be called, students talk about how they are on holiday), project management skills (brainstorming and delegation), consensus building (a student proposes a plan to structure the presentation, but another suggests an alternative approach), and technical difficulties (after a seven-minute absence, one student asks her partner "Are you there?" only to find out she had problems with her network connection). Their liberal use of smiley faces suggests and terms such as "excellent!" and "great!" suggests they formed a collegial relationship.

3. EVALUATION AND ASSESSMENT

Methodology

To see how the participation in an online multicultural educational environment can change the students' abilities to learn and acquire knowledge, this study used two evaluation methods. The first relies on interviews and usage data to gather an impression of how students interacted with and used open personal learning environment created under the Google TalkTech2008 site. For this we created a questionnaire (based on the experience gathered from using questionnaires in our previous work (Andone and Dron 2007), located online to which the students answered freely and anonymously.

The second employs an extended version of a usability methodology developed by Microsoft Usability Lab (Benedek, 2002), which looks at the students' perspectives on the desirability of various features of the environment and tools used. To evaluate the desirability we extended a usability methodology developed by the Microsoft focusing on the 'product reaction cards' method. The desirability test was combined with 2 open questions: 'list two difficulties you faced in completing this project and how/if you overcame them' and 'list the two most important things you've learned'.

29 Romanian students (97%) and 37 American students (82%) answered to the survey and took part in the evaluation process. The Romanians were senior to their American colleagues – average age 22.3 years old versus 18.6 years old and there were an almost equal numbers of females and males within the Romanian students (53% M and 47% F) while the male Americans were predominant (85% M and 15% F). Both studies are qualitative and are intended to guide possible future education methods rather than to prove the value of the tools used. The results of both evaluations imply and analyze the learning outcomes, multiculturalism, desirability of the environment and methodology, team work, use of communication tools, use of Internet technologies.

To evaluate the students' work for a course grade, both instructors independently graded each group's project. Grades were based on technologies used, evidence of documentation of the process on the project's Google site, and content/depth of information presented in the multimedia presentation. The instructors

shared their evaluations with each other, and then determined final grades for their own students.

Use of communication tools

During the project students were free to use any web-based communication tools they wanted. At the beginning of the project, students were asked to provide their IDs on different instant messaging and VoIP tools. The evaluation investigates how students used the various communication applications, and for what purpose – by observation of their entries in the Wall section of each group and during the online survey (a set of 9 questions).

Of the 16 groups, 13 described on the wall their methods of communication online: the most preferred one being synchronous meeting using instant messaging (IM) (such as AIM, Yahoo messenger or Google Talk) or VoIP.

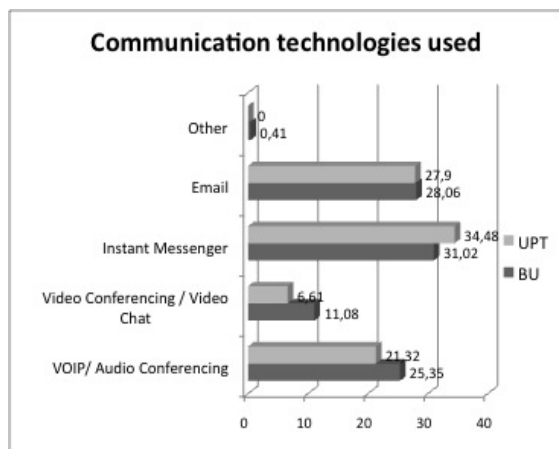


Figure 4. Use of communication technologies.

IM is increasingly becoming a general "talking" method. The use of IM was also reported as the preferred beside the live VoIP especially by the Romanian students: "it was easier to write than to talk", "writing it gives you time to think a bit about what are you saying."

Several students also reported that the most important decisions regarding the project work were taken during live IM chats and not in emails. They used Instant messenger mostly during the initial phase of topical research. In their instant messaging communications, they discussed about the division of tasks, organi-

zational details (when to 'meet again' and how), "getting to know you", and "difficulties we were facing". Almost half of the groups (46%) used VoIP and live audio/video conferencing (mainly Skype) twice during the project and a third (30%) once or twice weekly. 56% of the Bentley students used web cams for at least one of their synchronous e-meetings, probably because they are built into their laptops, while just 32% of the UPT students used web cams. Their use of voice was to delegate tasks ("who was going to do what"), determine content, and talk about "what we needed to do." One group said they gossiped. Their use of email was weekly (61% of the groups used it once or twice per week) and it was mainly for planning meeting times. They preferred email because it enabled them to have a record of their conversations when they exchanged information which was later included in their final project presentation. They also used email to send updates on their project work, in addition to, or sometimes instead of, posting it on the project Google Site.

A large majority agreed that online collaboration is an important way for people to work together in the business world.

Students remarked that synchronous communication was better for accomplishing the task, while asynchronous was good for non-time-critical decisions and updates: "it is easier to Skype with someone directly than playing tag via email"; "[it facilitates] brainstorming on the subject and tools to be used".

Multicultural aspects

Some students noted the differences in language and reported that they had to be careful when communicating with their international partners to be sure everyone was clear on their tasks. Said one group: "We moved at a snail's pace because we didn't want any misunderstandings in communication." A third of the Romanian students reported that they had difficulties in using English as a working language but all of them reported that their knowledge and understandings of English and of American culture increased after the project: "Americans are open persons" "Find out more info about American elections", "understand what is a social network stalker". Both Americans and Romanians found themselves as "very friendly" and "enjoyed chatting with" each other. To some extent their assumed perspective of how "the others are" has changed in a better and more realistic view.

Almost all the students found working across time zones and the process of finding compatible synchronous meeting times on their own to be difficult (all 16 groups listed this). Several students had similar sentiments that "collaboration is difficult when time zones are involved", and that it is "hard ... to coordinate a meeting schedule with 5 different students with different schedules when two of them are 7 hours ahead. We sometimes didn't meet as a whole group but usually had at least 4 or the 5 people present." Another student suggested that next time, the instructors "find schools with more compatible time zones."

In the survey the students were asked to list two difficulties which they encountered during the project. The majority listed the time difference between Boston and Timisoara. Some Romanian students said "[it was] difficult to speak/write in English at midnight", or "our colleagues from America wanted to work in the late evening for them which was 4 o'clock in the morning for us so we stayed up all night-not easy or nice." Their American counterparts noticed the problematic of the time zones on both sides of the ocean. One group said, "We met at inconvenient hours because they were the only hours both groups could meet." Another remarked, "Unfortunately we did not get to exchange very much with the Romanians because of the time we had to work on the assignment. We had a ton of trouble trying to schedule around all of our varying conflicts which made just talking for a little while about anything (even, sometimes, the assignment) very difficult."

Yet they did find common ground. Said one American student: "Romanians and Americans entertain themselves about the same way with multimedia." Another American student remarked, "How simple it can be to talk with someone across the world if schedules are compatible. The Romanians didn't seem all that different from students in the United States."

Global Reach

This exercise provided a tangible way for students to better understand the Internet's global reach. The ways in which they communicated and shared information have evolved from asynchronous email to synchronous live video conferencing due to advances in technology during the past decade. Students commented on the ubiquity of technology, and the ease in which they, as digital natives, "are

used to" using Skype and similar applications to interact with peers around the world.

By placing them in an environment which both required and supported Web-based collaboration, students were able to conceptually understand and really participate in a process that linked them with international student partners. Observed one student, "Technology can help you communicate no matter where you are in the world. You don't need to be face to face in order to do a project together."

Online Collaboration

A large majority of Romanian and American students considered that they did more work than their international colleagues, as they weren't able to properly evaluate their team work versus the result obtained. The course leaders observed that almost half of the groups weren't fulfilling equally their work. During focus groups following the project, three groups said that they found it difficult to work together because they felt that they and their international partners had different levels of dedication to the project. This may be because of the different weights that each instructor applied to the project to contribute to students' final course grades. One Romanian group felt that their American partners "were indifferent to the project, and haven't done too much." Students on both sides said they couldn't cooperate efficiently if their partners weren't answering their emails. The students also recommended that future projects have better-established communication requirements between groups (i.e., a set number of online live meetings, such as once per week), and smaller groups to encourage more open and more frequent communication. These recommendations were made in the open survey questions as well as during follow-up focus groups.

The groups that spent the most reported time communicating with each other, or who were gossiping about different issues online, have had the most accomplished, structured and comprehensive final projects. Better communication between the partners on the same project ("got new friends"), leads to better work results even if they never met face-to-face and their communication is just online.

Desirability Test

To determine how desirable the experience was, the authors developed a large set of

words that formed the basis for a sorting exercise. Since there is a bias to give positive feedback in the university relationships already established, we made sure that at least 40% of the set consisted of negative words and phrases and tried to make the set cover a wide variety of dimensions. Each word was placed on a tag and the set was given to the students at the end of the project in full anonymity. All participating students answered this evaluation test. Each student was asked to pick the words that best describe their "experience in participating in the project", then to rank them on a scale of one to five (with one being the most precise descriptor). This method presents results as a means of visualizing the frequency of use, but with an extra dimension not found in most tag clouds: the use of light gray marks the words which were most often used negatively, as those least appropriate to describe the tools, from the five most used.



Figure 3. Desirability Tag Cloud.

All students selected "accessible" and "useful" but also described the project as "confusing", "slow" and not well "organized" or "reliable". We believe that 'accessible' and 'useful' scored highly because these are new tools used in an innovative way with students. They all reported that this project was interesting and that they learned "a lot of new things". They described the experience of using all the instant communication tools to be fast and efficient, as was the pace of the project: "we learned more things in a month than in a year." They found the project a useful environment to use new tools and technologies, as trying "to use new tools made the project experience better;" TalkTech2008 was a social

environment to share ideas with peers, see what others are doing and, as one student said, 'give' them 'confidence that they are on the right track' with their studies and understanding of technology. They were proud of the high quality work products they created with their international partners.

4. LESSONS LEARNED

Unlike Chan, Frydenberg, and Lee (2007), who pre-arranged meeting times for Skype calls for their student groups over a two-week period, in this exercise, students had to arrange for their own meeting times and were permitted to use any computer-mediated communication tools. While the instructors thought this flexibility would be an incentive for students to explore and be more creative, some students felt that they could have benefitted from more structure and better defined milestones.

Several students reported that the open-ended nature of this project contributed to their uncertainty in knowing if they were meeting the project requirements. Students enjoyed the freedom using any tools they wanted for communication but, wanted to know exactly what they had to hand in, and how it would be evaluated.

The use of a Google site to facilitate collaboration proved successful. This was the first time that most of the students (from both countries) had used Google Sites, and there were no issues with it as a tool. The instructors chose a Google site over another collaborative wiki platform since all of the American students and many of the Romanian students already had Google IDs.

4. CONCLUSIONS

This study tried to identify how students use an online collaborative environment, what is their understanding of new web 2.0 technologies, and how this can be incorporated in an educational environment. The authors emphasize that the study had a small sample (30 Romanian and 45 American students), that all students have a strong technical background – and were considered digital students (as resulted from the pre-study questionnaire). The purpose of this qualitative study was not to test a finished system but to feed into the design of others by discovering how well our attempts to cater for previous discoveries (Andone, Dron, & al., 2007) (Chan, Frydenberg, & Lee, 2007) matched student needs.

Throughout the project, the instructors worked to provide support, build an online collaborative environment through the TalkTech web site, and encouraged students to use it, along with other web based tools to complete the project. Students sometimes used the tools with which they were most familiar, and other times experimented with new applications to determine which are best suited to solving the problems they faced.

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