An Alternate Reality Experience for Language Learning: A Design-Based Evaluation

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Introduction

Given the complexities of language, some scholars and practitioners have turned to computer-assisted language learning (CALL) as a means for improving the language learning process. Unfortunately, these efforts have at times resulted in a situation where technology drives the selection of tools as they have become available. An alternative and inherently more interesting approach is to identify a pedagogical need in the language acquisition process and then adapt technology to address that need.

One often hears that "The most effective way to learn to communicate in a language is to live in the country where the language is spoken." Teachers are sensitive to the value of in-country experience to facilitate the language learning process, but they also recognize that most of their students will likely not have that opportunity. Seeking ways to bring a glimmer of that type of experience to their classroom, some teachers and textbook writers have turned to social media platforms such as Facebook and Twitter as a substitute of sorts for the in-country experience. Prensky (2001) essentially explained an additional aspect of the attractiveness of this approach for today's students, labeling them as "Digital Natives," and thus acknowledging that they have been raised in a world in which they have encountered digital technology almost since birth.

Unfortunately, as attractive as social media might be for providing meaningful opportunities for communication in the target language, simply telling students to "go communicate online" constitutes an inadequate level of guidance. Also, although teachers might provide students with well-conceived assignments for tasks to be carried out in the target language, it is virtually impossible to verify the quality of each individual experience and how well-connected it is to course objectives. In addition, this sort of open-ended approach does not provide opportunities for providing systematic and targeted feedback. By capitalizing on the background knowledge and personal habits of the student participants in these new areas, it is hopefully possible to open the door to more meaningful and active learning than is typically present in many classroom-based, language-learning experiences.

Although social media used on the scale that is possible today is a relatively new phenomenon, it can actually be considered to be a new instantiation of the area of computer-mediated communication (CMC), a technology that has occupied a place of interest in language arts for over three decades (Burns, 1984). Beauvois (1997) summarized the advantages of one particular instantiation of CMC, observing that it can be "both linguistically and socially effective for the student and as a powerful tool for the instructor in the ongoing endeavor to enhance the language acquisition process" (p. 182).

In that same vein and discussing their more recent work, Savignon and Roithmeier (2004), write:

CMC is a contemporary medium of communication in its own right, offering new possibilities for intercultural exchange and collaboration. For FL environments, in particular, the incorporation of network-based CMC seems a significant addition to the long-established practices of procuring pen pals and watching news clips and films. Moreover, the opportunity for interpersonal interaction afforded by CMC can take place between persons for whom the language serves as an additional language as well as between learners and those for whom it is a primary language (p. 285).

The most prevalent form of CMC available today is social networking, as exemplified by commercial systems such as Facebook, which has been most recently investigated in language learning settings by a few other researchers such as Muhammad, Ahmad, & Abidin (2010); Shih (2011); and Mitchell (2012). These researchers noted various weaknesses and challenges with settings based on Facebook, for example, the difficulty in making new friends who speak the target language (Mitchell, 2009) and the reliance on incidental acquisition of vocabulary (Muhammad, Ahmad, & Abidin, 2010). The latter group of researchers suggested that future research "should examine learners' interaction and engagement with others in various pre-planned and pre-determined language learning tasks with specific objectives within the online environment" (p. 195).

The Purpose and Approach of this Study

To increase the quality and level of student engagement and to address the limitations of commercial systems such as Facebook, this project implemented two specific design principles. First, developers implemented a simulation-based setting in which a fictional story takes place and in which students become participants in a novel way. Instead of students communicating solely about themselves via blog posts or status updates, they experienced a story presented on a social network by fictional characters with which the students emulate the sort of interaction they would have with friends on a platform such as Facebook. The pre-conceived storyline provides the context for pre-planned and pre-determined tasks with specific objectives. Second, to provide the necessary level of control over the environment, the team turned to an open-source, social network engine called ELGG (See http://elgg.org/).

The software development necessary to make this experience possible involved student developers and professors collaborating to develop characters and storylines that had the potential to facilitate classroom activities through a controlled environment in which students followed the lives of several fictional characters over the course of three weeks. During their experience with the system, students saw status updates by the characters, read blog posts, viewed photos, and received private messages from the characters. They also responded to the characters' questions and posted their own thoughts directly to the site.

The study described here thus involved the exploration of differences attributable to learners, teachers, the learning environment, and the curriculum to which was added the interaction of the nature of language and the process required for its acquisition. The resulting complexity in the variables explored suggested that design-based research methodologies would provide the most suitable framework for the study. Because some variables cannot be manipulated, it is possible within this framework to implement both quantitative and qualitative measures to investigate changes over time according to the application of important design principles (Barab & Squire, 2004). Using this approach, it was possible to begin with an instructional design strategy that could yield an interesting and pedagogically sound environment for learning and then to make changes based on the outcomes observed during each iterative cycle.

Such a study holds significance at various levels. The first has to do with what can be learned relative to the changes made in the instructional setting itself. From the lessons learned in that mode, it is possible to derive useful principles that inform instruction. Second, not only do these principles contribute to the field's understanding of specific CALL implementations, but they also hold important implications for better understanding the language acquisition process itself. Finally, although many studies have been conducted to investigate how the Internet is being incorporated into the classroom as well as the pedagogical implications and teacher attitudes toward technology (McFarlane, Green & Hoffman, 1997), little has been done to determine student attitudes toward the type of learning explored in this project (Levy & Stockwell, 2006).

Research Questions

This study sought to address the following two specific questions: What were the effects of changes in the study's instructional environment upon student attitudes towards the learning experience? What, if any, effect did implementation differences have upon the relative success of each iteration of the ESL Silver program?

Review of the Literature

Over the years, technology in various forms has consistently shown the potential to play an important role in a wide variety of applications for learning (Kulik & Kulik, 1987; Glennan & Melmed (1996), and McArthur & Lewis (1998). In addition, applications have extended to address diverse needs in language acquisition (Bush & Browne, 2004). For a very brief historical review, perhaps the first empirical study to demonstrate that technology could play a role for language learning was published as far back as 1971 (Bunderson & Abboud, 1971) and showed how computers could facilitate the teaching of the Arabic writing system. Other seminal software applications have followed in the intervening years, such as those that explore various types of glossing that can be made available for online reading (Chun & Plass, 1996), computer-mediated communication (Beauvois, 1997), and interactive video (Lyz, 2010). As technology has advanced, so have the applications that address language-learning needs, which will be discussed in the next section.

Evolving Technologies for Language Learning

The most prevalent function of technology in classes today is that of presenting information. Outside of the classroom, accessing information via Google has turned into a tool that the average student finds increasingly indispensable. Information, however, is not the only thing available through the Internet. In fact, the current generation of the Web provides a wealth of multimedia resources that can be accessed much more interactively than in the past.

As one example, teachers look to the Internet in a way akin to how people use Google in other aspects of their lives: as a source of immediate and varied samples of language content for use in the language classroom (Conole, 2008; Mitchell, 2009). Through the example of their teachers and no doubt through their own means, language students have also discovered that the Internet today provides an incredibly large repository of centrally located, quickly accessible information, certainly the largest that has ever existed. Indeed the varied combinations of resources and interactivity that become possible enable the development of a plethora of exciting new tools for language learning and practice (Lomicka & Lord, 2009).

The development of these capabilities comes with the implication that they are constantly evolving with no end in sight. In the last ten or fifteen years, the power and mobility of technology has increased exponentially, making its way into users' homes, cars, classrooms, and even their pockets.

Addressing the Needs of Digital Natives

The age group on which these incredible advances in digital technology have had the most impact are those young adults for whom technology has been an integral part of their lives since birth. That presence of digital technology has provided them with an innate ability to understand, adapt to, and utilize both existing and emerging technologies (McBride, 2009; Stockwell & Tanaka-Ellis, 2012). The connection implied with that involvement with technology has led one researcher to refer to them as "Digital Natives" (Prensky, 2001) and another to call them the "iGeneration" (Mills, 2011). This group's use of technology has involved virtually all aspects of their lives including time management, entertainment, and communication with others.

One side effect of this constant electronic barrage that students encounter in their everyday lives is that they have become accustomed to a very high level of stimulation. Educators who encounter these young people in their classrooms must find a way to connect, despite the abundance of other signals directed at their young charges. Instead of trying to force students into an environment that is at odds with the rest of their lives, however, educators can perhaps use the same technology that students already use as a way to counter the opposition, so to speak. Because students like obtaining information in new and innovative ways, this approach can bring an added level of engagement to the learning process (Antenos-Conforti, 2009; Kinginger, 2007). A wonderful side effect of connecting with these Digital Natives is that the type of technology making this connection is also capable of connecting them with the language and culture (Stockwell, 2007; Wang, 2005).

The importance of story. Stories are important for everyone, not just Digital Natives. As Schank (1990) points out, they are not just something that we enjoy, but they are an integral part of cognition itself. As he wrote:

> People think in terms of stories. They understand the world in terms of stories that they have already understood. New events or problems are understood by reference to old previously understood stories and explained to others by the use of stories (p. 219).

Thus the nature of stories, or narrative in the strictest manner of speaking, becomes important for much more than motivation. Stories become a key element of how our minds process language in the world around us.

Using technology to connect students with language and culture. Knowing what students need and what technology can do, educators are beginning to use the tools that students are already using in their everyday lives to assist them in the acquisition of language skills. One example of an innovative tool in use are apps for smartphones and tablets that go beyond a basic paper dictionary and provide interactive drills and quizzes on vocabulary, grammar constructs, and culture. Tools such as these capitalize on the capacity that computers have to perform repetitive actions and track results, and they can be effective when working on bottom-up skills in a language.

Another major issue in language instruction is that it can be difficult to get the full "in-country" experience necessary to truly improve language and culture skills. To solve this dilemma, we must turn to the ability the Internet has to immerse users in a rich world through images, video, and most importantly:

story or narrative, to say it another way. Teachers have been using the idea of story to teach language for a very long time, but advances in technology now allow users to experience and take part in a story rather than just passively receiving one. This participatory experience plays off the strengths that technology has in presenting information in a variety of interactive ways, in addition to taking advantage of the students' inherent ability to use innovative tools to learn, thereby increasing the effectiveness of their learning experience. Because multiple users would be accessing these tools with the same goal in mind, the next logical step in would be to connect these users with each other so that they might assist one another in practice, provide assistance when possible, and motivate each other as they participate in the simulation.

Using technology to connect students with students. Not only is the use of technology an excellent way of connecting students with information, but new developments in telecommunication have also made it a highly effective means of connecting students with each other (Kurata, 2010). Tools such as video conferencing, instant messaging, and email were originally designed to connect people, and with appropriate guidance, they can effectively connect students as well (Kinginger, 2007). Students who are learning a language need others for the practice that is essential for them to improve their skills, and new technologies have the capacity to connect them to those who can help make that practice a reality, regardless of former hindrances such as distance or time (Stockwell, 2010).

Computer Mediated Communication

Because of the important role that communication plays in the language learning process, and the ability that computers have to foster communication, we can use emerging technologies to increase the effectiveness of the process. In addition to being able to communicate in new ways, the use of computer-mediated communication (CMC) can do a great deal to enhance the language learning process. Although not initially conceived as a language-learning tool, one of the earliest computer-based tools to be implemented for learning is computer-mediated communication (Burns, 1984). CMC adds a layer of enhancement to conventional net-based communication because the interactions can be observed, recorded and tracked.

Compared to what we can consider to be classic CMC, the Internet is the newcomer on the scene, but it especially allows for interactions that would not have been possible in the past (Kurisak & Luke, 2009). Indeed, early CMC implementations required terminals connected to mainframe computers or a networked lab. Today's tools such as email, video chat, forums, blogs, instant messaging, etc., are becoming an essential part of life for many people for basic communication. Interestingly, each of these tools can also benefit language students when used properly and offer various strengths that enhance the CMC process. For instance, the Internet can be a less intimidating forum for conversation because there is not a face involved, and speakers can take the necessary time to plan communications (Kurisak & Luke, 2009), which is not possible when communication takes place in person. That fact alone can take away a great deal of the anxiety many language learners might have in the typical classroom.

Social Networking

One specific type of CMC are social networking sites (SNSs), such as Facebook, Twitter, MySpace, LinkedIn, etc., through which people are able to connect and communicate with each other in a public or semi-public forum. Social networking has become extremely popular and has infiltrated many students' lives, and it is now making its way into the language classroom (McBride, 2009). Social networking brings together the optimal combination of technologies for various types of communication, and thus are a highly effective tool for language practice. For example, by offering both synchronous (e.g.

instant messaging) and asynchronous (e.g. wall postings) tools for communication, social networking activities for language learning can elicit different skills, depending on the platform and purpose for communication. This also means that the various skills can be targeted at different levels (Stockwell, 2010). In addition to providing the opportunities to exercise a variety of skills, social networking sites can also provide extensive, authentic material for students (Stockwell & Tanaka-Ellis, 2012). All of these tools combine to foster socialization in the language, and they engage learners in language practice that is both motivating and linguistically appropriate (Mills, 2011).

The high levels of use of SNSs by college students leads teachers to believe that they could be an effective language-learning tool, especially with respect to finding resources for interaction (Kurisak & Luke, 2009; Kurata, 2010). Not only are these sites familiar to most students, social technology is always available and peoples can always be connected, rather than being limited to exchanges that take place in the classroom, which greatly enhances the language-learning environment (Antenos-Conforti, 2009). Not only that, but students tend to appreciate the opportunity to interact outside of class through a social network (Kurisak & Luke, 2009), and self-directed learning via a social network can complement classroom interaction very well (Mills, 2011). Nevertheless, a teacher cannot simply instruct their students to go onto a social networking site and hope that they will simply absorb language. More direction than this is essential, which is where the idea of computer-mediated communication can assist.

Implementing CMC and Social Networking for Language Learning

As explained above, the level of engagement that computer-mediated communication and social networking sites provide to students makes the use of these types of tools quite enticing for second-language teachers. Because of this, several researchers have already used CMC and social networking sites in various ways for language learning, and they have laid out specific strengths of these types of programs. For example, one key advantage is that social media can provide a great means of self-expression, which leads to a higher level of output. SNSs can be very motivating because students can discuss common interests, popular topics, and share their own experiences, thereby creating highly personalized content (Stockwell & Tanaka-Ellis, 2012; Antenos-Conforti, 2009; Vesisenaho, Valtonenen, Kukkonenen, Havu-Nuutinenen, Hartikainen, & Karkkainen, 2010). SNSs force students to "take an active role in their learning" because they are the creators of the content, not merely consumers (McBride, 2009). By sharing their own stories learners express themselves, build community and help establish identity (Nicholas, Rossiter, & Abbott, 2011; McBride, 2009).

One of the biggest advantages of social networking is the community it creates where interaction and communication is encouraged. Students form relationships in the SN, which then lead to increased meaningful interaction (Evans, 2009; Mills, 2011). This community then becomes a great avenue for informal negotiation of meaning (Antenos-Conforti, 2009).

Principles for Guiding Implementation

Although it is important to recognize what functions any given type of technology or application can have to aid the learning process, it is equally necessary to understand how the technology should be used for maximum efficacy.

As a powerful tool, technology has the potential to lead to the development of dynamic learning environments, support cross-cultural communication, foster critical thinking, and engage and motivate learners, but in and of itself it does not guarantee successful learning. Like all tools, the utility of

technology ultimately depends on how, when, and why it is implemented—on both how it is presented to learners and how they respond to it (Kurisak & Luke, 2009, 173).

There are several factors relating to the creation and implementation of a new curriculum that can influence its effectiveness:

1. Participant buy-in
2. Complete classroom integration
3. Close observation and adaptation
4. Pedagogically-based usage

The idea of participant buy-in is that all participants, including curriculum designers, teachers, students, and administrators, must be fully invested in the curriculum to make it work (Kurisak & Luke, 2009). Dedication to the program is necessary if the program is to be adequately integrated into the classroom. Students need to feel like their work is part of a normal curriculum; otherwise, they may become biased against it (Blake, 2008). We also need to pay attention to how both students and teachers respond to technology and adapt curriculum accordingly (Hamilton, 2009). Because there can be ups and downs in motivation throughout the implementation of something new, we must be sure to observe interactions throughout the entire program (Kurisak & Luke, 2009).

The other most important variable in the effectiveness of a new technology-based program is extent to which it is based on sound pedagogical principles. Educators need to focus more on the technology's pedagogical implications for language learning rather than the fact that the technology seems "cool" (Burston, 2003; Chapelle, 2010; Evans, 2009; Hamilton, 2009; Kern, 2006; Stockwell & Tanaka-Ellis, 2012). The technology has to do more than just replace pencil and paper homework; it has to provide something valuable that was not there before (Kurisak & Luke, 2009; Markee, 2005). We know that technology can be great, and it can fail miserably. What is important now is that we differentiate between effective and ineffective uses of technology in the classroom and then act accordingly (Kern, 2006; Quinn, 2005).

Procedures

The framework created for carrying out this study's exploration involved the creation of an Alternate Reality Experience for Language Learning (ARELL, which involves a social network that is similar to Facebook. The team augmented the basic social networking functionality with added capabilities made possible by the ELGG Open Source Networking Engine mentioned earlier. Using this system, students are able to create a personal profile page and interact with one another as well as with fictional characters as a story unfolds in real time. The characters of the story appear as normal members of the students' social network—i.e. their "friends." The characters seemingly share aspects of their lives in various ways and according to a pre-determined schedule using status updates, communications among characters and with the students, photo postings of fictional trips, as well as normal blog posts. Students read the characters' status updates and blog posts as well as receive personal messages from the characters. While the system as modified allows for automation of most of the posts, it is possible for a native speaker of English to write an improvised post to one or more of the students, posing as one of the characters.

The result involves bringing elements of a story into the real world and making it a part of the lives of the students and provided opportunities not only for online activities but also for activities that can take place in the classroom under the guidance of the teacher. In order to construct a story, developers took a syllabus for an English grammar class and used that as the starting point in the creation of a scope and sequence appropriate for the target students. The developers then wrote a narrative that followed the course syllabus as a means for aiding students and teachers in achieving the goals described in the scope and sequence. Over the course of the various iterations, the story was revised for both content and linguistic appropriateness. Thus, although the pilot iteration of ESL Silver revolved around nine characters, the final story as implemented centers on five. These five characters are college-aged students, with four of those being American and one is Japanese. The program begins with one character, who has just arrived in Park City, Utah, on a search to find people who knew her recently deceased grandfather. He hope is that someone she meets will be able to help her identify a mystery woman who appears in pictures she discovered in her grandfather's attic. The narrative explores the lives of the various characters, which include her and four other people she comes in contact with as they navigate common issues that young adults face, including academic life, the ups and downs of employment, living with roommates, making decisions, living in a new area, and dealing with misunderstandings, as examples of just a few details.

Using this system, christened "ESL Silver" for this study, four iterations of the experience were conducted at the English Language Center (ELC) at Brigham Young University (BYU). The ELC is a lab school supported by BYU whose aim it is to provide students with curriculum in line with research at the forefront of the fields of linguistics and language acquisition. It strives to give teachers the chance to do a language teaching practicum where they may use a variety of methods for instruction. Classes at the ELC fall into six different proficiency levels, Foundations A, B, and C, which are classes teaching English basics, and Academic A, B, and C, which seek to prepare the students for a university environment. When students are admitted to the ELC, they take a placement test to determine their level, and each semester they move up to the next level, assuming they pass their final proficiency exams. It should be noted that ESL Silver was originally based upon the syllabus for the Foundations C level.

Although the number of students varied across the four iterations conducted, the types of students were fairly equally across the groups. They were of differing nationalities speaking various native languages, but they were all at roughly the same English proficiency level. There were both males and females mostly ranging from 18 to 30 years old, but with a few outliers up to 42 years old.

Before beginning the program, students took a survey designed to discover ways they might use technology in their daily lives, their attitudes toward technology, their attitudes towards homework, and their experiences with language learning. Students then participated in the social networking experience, which lasted between two and four weeks depending in the iteration. Starting with the second implementation, the server on which the site was hosted tracked student activity, storing information on the time students spent on the site as well as the actions they took. Finally, upon completion of the experience, students took a survey identical to the pre-survey, with the addition of questions relating to their experience with the social networking site. The researchers also conducted interviews with the instructors in the classroom as a means for determining the teachers' views on the experience and thus gain a broader sense of how the program was implemented and the ways in which students participated. Table 1 presents a summary of the several implementation variables.

Table 1:

Differences in Implementation of ESL Silver Across Iterations

	Iteration						
	1		2		3	4	
Class							
Level	Foundations B	Foundations C	Foundations C	Foundations C	Foundations C	Foundations C	Foundations C
Type	Reading	Reading	Reading	Reading	Reading	Reading	Writing
# of sections	1	2	1	1	1	2	1
Teacher	A	B	C	D	B	E	F
# of students	16	28	15	17	7	31	16
Implementation							
Semester	Fall 2010		Winter 2011		Summer 2011	Fall 2011	
Length of run	1 week		4 weeks		3 weeks	3 weeks	
Concurrent with other material	Yes		No		Yes	Yes	
# of weekly lab visits	3	1	0-3	0-2	3	2	1
Story							
# of characters	9		8		5	5	
Main storyline	Romance		Romance		Mystery	Mystery	
Completed	No		Yes		Yes	Yes	

Iteration 1

Because the ELC wished to do a pilot study of ESL Silver before deciding to move forward with the full project, ESL Silver was implemented in Fall Semester of 2010 in three classes: one section of Foundations B Reading and two sections of Foundations C. There were 16 students in the Foundations B Reading class and 28 students in the two sections of Foundations C Reading classes. In the Foundations B class, students spent two to three days a week in the computer lab working on ESL Silver in the classroom. Initially, students were scheduled to work on ESL Silver once a week in class but because the content was too difficult for the Foundations B students, additional days in the lab were added. Foundation C students, on the other hand, spent one day a week working on ESL Silver in class. Both levels spent 30 minutes in class working on assignments and activities.

For this first implementation, the story was not yet fully developed, so the students were only exposed to portions of the story. There were nine characters, and the students were to focus on two main stories: one narrating a romance, and the other a mystery. Because the content was incomplete, the classes ran ESL Silver concurrently with their regular homework, which consisted of reading novels and completing the accompanying assignments. Also, the correction tool had not yet been developed, and so the teachers were unable to use it to edit student posts.

Iteration 2

Between the first and second implementations of ESL Silver, the story was revised and completed, resulting in four weeks of material. One character was eliminated from the story, and the secondary characters were given their own plot lines, which resulted in six overlapping stories among the eight remaining characters.

Because the team had determined that the content was too advanced for the Foundations B students, the second implementation of ESL Silver was conducted in two Foundations C reading classes. There were two new teachers for this iteration, so we trained them on how to use the ELGG Web site and the error correction tool. We also provided them with a rationale for the concept of ESL Silver as a teaching tool. The teachers were given copies of all site postings 3 weeks before the program began so that they would have time to prepare lesson plans and familiarize themselves with the plot lines before the program began. We also sent possible homework assignments, in-class activities, and quizzes for the teachers to use throughout the month.

Rather than doing ESL Silver at the same time as other homework, it took the place of a novel so that students would have more time to focus on the material. They met in the lab three times early during this iteration and then were required to do the rest of their studying at home. Daily comprehension quizzes were given as informal assessments, but students were only given points based on their reporting of whether or not they did the assigned reading. There was occasional brief discussion of the answers to questions on the quizzes, but other than that, the teachers did not work on ESL Silver in class. The teachers also did not use the error correction tool, although it was available for this iteration.

Iteration 3

Based on feedback received from the teachers and students of Iteration 2, the developers made several edits to the material during the time between the second and third implementations. The number of characters was reduced from eight to five, and the entire romance storyline was eliminated. All posts

were edited for appropriateness for the students' proficiency level, and the duration of the program was reduced to three weeks.

For this implementation, ESL Silver was used in one Foundations C class taught by one of the teachers who had been involved in the program for the first iteration. Because of this previous involvement, the teacher received no special training other than updates on the program and information on the results from the second iteration. On average, the class visited the computer lab three times a week for about fifteen minutes to look over the content together, and then they would discuss the story in class about twice a week. However, other activities in class were related to topics and grammar patterns that appeared in the ESL Silver content on a daily basis.

Iteration 4

Because student reactions to the story in Iteration 3 had been fairly positive, we decided to focus more on implementation of the material rather than the material itself in Iteration 4. Thus, all content was kept the same as in the third iteration and teacher training became a focus, with both teachers for this iteration receiving one-on-one instruction on the purpose and possibilities of ESL Silver.

ESL Silver was used again with two groups of Foundations C students at the ELC, but this time, students in one of those groups used ESL Silver in both their reading and writing classes. The other class only discussed the material in their reading class. One teacher taught both reading classes, and the other taught one writing class. In the reading classes, students spent 15 minutes twice a week in the lab and other time in class discussing the material. The students in the writing class went to the lab once a week for 10 minutes and were assigned to write their own blog posts outside of class relating to topics discussed in class. Both classes used the same ELGG site rather than using separate sites as had been done in previous iterations.

Survey Instrument

The main purpose of the post-survey was to ascertain student attitudes toward ESL Silver. Students were asked a number of questions relating to several aspects of ESL Silver. The questions were presented as statements with Likert-type responses where students would indicate how much they agreed or disagreed with each statement. The main topics of the questions referred to:

1. The program as a whole,
2. Their teacher's participation in the program,
3. The story and characters, and
4. The English learned as a result of the program.

In order to compare Iteration 1 with the others, the six-point scale was condensed to four points. For the recoding, "slightly disagree" was merged with "disagree" and "slightly agree" was merged with "agree." The goal was to preserve the underlying nominal nature of the Likert items while yielding a conversion that would be as accurate as possible. Table 2 contains the values of the four- and six-point scales and their equivalences.

Table 2:
Equivalences between Four-Point and Six-Point Scales

Four-Point Scale	**Six-Point Scale**
1 – Strongly Disagree	1 – Strongly Disagree
2 – Disagree	2 – Disagree
2 – Disagree	3 – Slightly Disagree
3 – Agree	4 – Slightly Agree
3 – Agree	5 – Agree
4 – Strongly Agree	6 – Strongly Agree

As mentioned above, the questions relating to ESL Silver all centered around four main topics. In order to compare student reactions to ESL Silver, we chose to combine questions that would indicate attitudes for each topic. To ensure a valid measurement of each attitude, we only used questions on each scale that were highly correlated with the other items on each scale, which resulted in the exclusion of some items. Table 3 lists the main comparison topics and the questions that make up each scale for the four-point Likert items.

Table 3:
Scale Items Based on the Four-Point Items

Scale	Cronbach's Alpha	Items included in scale
Overall Attitudes toward ESL Silver	0.945	Q2. I liked the story on ESL-Silver . Q3. The English I learned on ESL-Silver is relevant to my life. Q4. I think ESL-Silver is fun. Q5. ESL-Silver helped me learn English. Q8. I liked the characters in ESL-Silver. Q9. I want to know more about the characters in ESL-Silver. Q10. The characters in ESL-Silver were believable.
Attitudes toward teacher involvement	0.823	Q12. My teacher prepared me to use ESL-Silver. Q14. My teacher helped me when I had questions.
Attitudes toward story	0.915	Q2. I liked the story on ESL-Silver. Q8. I liked the characters in ESL-Silver Q9. I want to know more about the characters in ESL-Silver. Q10. The characters in ESL-Silver were believable.
Attitudes toward English learned	0.841	Q3. The English I learned on ESL-Silver is relevant to my life. Q5. ESL-Silver helped me learn English. Q6. I still remember words and phrases I learned on ESL-Silver.

The revision to the survey also included the addition of a question asking students whether or not they preferred ESL Silver to their regular homework. The difference in scale and questions required separate scales to be created to more accurately compare Iterations 2-4, which used the updated survey instrument.

After the pilot of ESL Silver, the researchers involved in the project revised the survey to better understand the attitudes of the students themselves. The main goal of the revision was to determine whether differences in the students might affect the ways in which they react to the program. As part of this revision, the developers decided to switch from four-point Likert scale items to six-point items in an effort to increase the variance found in student attitudes toward ESL Silver. Table 4 lists the items in each scale in along with the values of Cronbach's Alpha estimate of reliability for each scale.

Table 4:
Scale Items Based on the Six-Point Items

Scale	Cronbach's Alpha	Items included in scale
Overall Attitudes toward ESL Silver	0.962	Q2. I liked the story on ESL-Silver. Q3. The English I learned on ESL-Silver is relevant to my life. Q4. I think ESL-Silver is fun. Q5. ESL-Silver helped me learn English. Q8. I liked the characters in ESL-Silver. Q9. I want to know more about the characters in ESL-Silver. Q10. The characters in ESL-Silver were believable. Q11. I prefer ESL Silver to my regular English homework.
Attitudes toward teacher involvement	0.837	Q12. My teacher prepared me to use ESL-Silver. Q14. My teacher helped me when I had questions.
Attitudes toward story	0.933	Q2. I liked the story on ESL-Silver. Q8. I liked the characters in ESL-Silver. Q9. I want to know more about the characters in ESL-Silver. Q10. The characters in ESL-Silver were believable.
Attitudes toward English learned	0.895	Q3. The English I learned on ESL-Silver is relevant to my life. Q5. ESL-Silver helped me learn English. Q6. I still remember words and phrases I learned on ESL-Silver.

Results

Quantitative Analysis

Because this study implemented methods of design-based research, we measured student attitudes toward ESL Silver over time and compared iterations using the scales mentioned above. We compared the means of each scale across iterations using an ANOVA and then performed a Tukey post-hoc analysis to assess the significance of any differences between the various groups.

Comparing Iteration 1 to the rest using these measures, the only significant difference is with the second iteration. As shown in Table 5, although the attitudes toward teacher involvement in the program of the students who participated in Iteration 2 were not significantly different from the rest of the iterations, their overall attitudes toward ESL Silver were lower than the others. Using Tukey's post-hoc test of significance, Iteration 2 proved to be significantly different from Iteration 1, Iteration 2, and Iteration 4 ($p < .01$) on overall attitudes toward ESL Silver, attitudes toward the story, and attitudes toward the English learned throughout the program.

Table 5:
ESL Silver Attitudes Across Iterations on a Four-Point Scale

	Iteration				
	1 *n*=21	2 *n*=19	3 *n*=15	4 *n*=28	1, 3, & 4 *n*=64
Overall Attitudes Toward ESL Silver	3.0136	2.0526**	2.7810	2.8214	2.8750
Attitudes Toward Teacher Involvement	3.3095	3.1579	3.4333	3.5000	3.4219
Attitudes Toward Story	3.0000	2.0395**	2.7667	2.8214	2.8672
Attitudes Toward English Learned	2.9683	2.1930**	2.7333	2.7500	2.8177

**$p < .01$

In comparing Iteration 2, 3, and 4, the six-point scale was used in order to provide a more accurate measurement of the student attitudes. There was also an additional question added to the post-survey asking whether or not the students preferred ESL Silver to their regular homework. Table 6 contains the mean responses.

The results shown on the six-point scale are similar to those from the four-point scale in that Iteration 2 was the only one with any significant difference. On average, students from the second iteration preferred their regular homework to ESL Silver and they did not react positively toward the program. The other two iterations, however, had more students who preferred ESL Silver, citing that they enjoyed the story and they believed it helped them learn English. Also like the four-point table, a post-hoc analysis using Tukey's post-hoc test of significance indicates that the differences on Iteration 2 were significant ($p < .01$). There was no significant difference in attitudes toward teacher involvement in the program.

Table 6:
ESL Silver Attitudes across Iterations on a Six-Point Scale

	Iteration		
	2 *n*=19	3 *n*=15	4 *n*=28
Overall Attitudes Toward ESL Silver	2.6711**	4.0250	4.1071
Attitudes Toward Teacher Involvement	4.9474	5.4000	5.3393
Attitudes Toward Story	2.7368**	4.0167	4.1339
Attitudes Toward English Learned	2.8947**	3.9111	3.9524
Preference of ESL Silver Over Regular Homework	2.2600**	3.6000	4.0400

**$p < .01$

Qualitative Analysis

Before beginning ESL Silver, each teacher received a document with the full program's content, a list of which posts were relevant to storylines and which were not, assignments and quizzes, which they could use in conjunction with the program, and they were instructed on how to interact with the ELGG website. Although teachers were given the same material and instructed in roughly the same way, because of teacher differences, the implementation of the program varied quite a bit from semester to semester. Also, each successive teacher was able to learn from the experiences of previous teachers, which influenced the way that ESL Silver was presented. The following is a narration of differences in implementation between iterations. This information was gathered from the teacher interview protocols after ESL Silver had been completed.

Iteration 1. Because Iteration 1 was the pilot, no teacher interview protocol had yet been devised, and so we do not have specific information about how the program was presented.

Iteration 2. According to Teacher C from Iteration 2, there was a prevailing attitude of disdain toward the ESL Silver portion of her class. She expressed that a few students in particular would speak out against the program when it was time to take quizzes in class and that students who generally did all of their readings were not keeping up with the ESL Silver material. She also made a guess that the students may have been talking poorly about the program outside of class.

When questioned about how they ran ESL Silver in their classes, it was discovered that neither Teacher C nor Teacher D used the resources given to them, and there was very little discussion of ESL Silver in the classroom. After the first few days of getting used to the software, students were told to simply read everything and that they would be quizzed on it. There were no specific assignments, nor did the teachers mention ESL Silver in class other than to give them occasional comprehension quizzes.

According to Teacher C, when the students asked why they were doing the program, she responded that it was an experiment to see if something like this could work, and they "just had to."

In order to understand the teachers better and why they implemented ESL Silver the way they had, they were asked about their own "digital nativeness." Both teachers of this semester fully admitted to not being as familiar with technology as others—that they used it when necessary, but were not the type to use it in every aspect of their lives. Teacher C also discussed being skeptical of a program like this at first, and although her opinions had changed by the end, her actions in regards to ESL Silver had already taken effect.

Iteration 3. This semester was the closest that ESL Silver came to running as originally intended with regular assignments and quizzes. Teacher B, who taught during this iteration, had used ESL Silver during the pilot study the previous Fall Semester and was thus very familiar with the program. Students routinely were allotted in-class time to spend in the lab, and there was consistent discussion of the story as well as use of blog posts to teach specific language skills (e.g. reading strategies and grammar principles). Teacher B saw a great deal of value in this type of program as a means of presenting authentic language samples in an informal setting. She stated that several students seemed to enjoy it, though there were a few who did not grasp the point of it. Unfortunately, the ESL Silver server crashed twice during the semester, causing the site to be inaccessible for a few hours on each of those occasions.

Iteration 4. During this semester, schedules and teachers worked out such that there were two different reading classes using ESL Silver, and one of those classes used the Web site for their writing class as well. In previous iterations where there was more than one class, each class would use their own version of the website. This iteration, however, students indicated that they would all like to be on the same site, and the teachers obliged. The students who worked on the program in their writing class received regular assignments to write their own blog posts. Because the teachers had other material to cover in their classes, they offered up ESL Silver more as a fluency activity that was to be enjoyed and not be stressful. There were assignments and in-class lab time for the program, but the implementation was not as structured as previous iterations. The teachers used the site as fun practice, and Teacher E made sure to post regularly, which resulted in an increase of posts responding to her. Teacher E also mentioned that because there were so many posts from other students, they did not follow the story very closely but used student posts as reading practice.

According to both of the teachers, students enjoyed writing back and forth to each other, which resulted in a number of posts above that which they were required to make. Although Teacher E discussed mixed reviews in her class from the students about ESL Silver, Teacher F mentioned that students were asking to work on ESL Silver in class if there was time and in her words, "They loved it! It was fun." Other student responses from the survey indicated that the only things they would change about the experience were related to the aesthetic design or features of the Web site rather than about the nature of the experience itself.

Discussion

The purpose of this study was to investigate the use of a social medium platform (ELGG), implemented with principles of computer-mediated communication. The resulting software features combined to form the delivery mechanism for a sort of simulation that was christened ESL Silver, which

involved the unfolding of a basic storyline with several threads. As shown in the previous section, the results across four iterations were generally quite positive, with the second being something of an outlier. Because the results of that iteration were generally not on the same level as the others and failures often provide more learning than successes, it is there that we begin this discussion.

Iterations 1 and 2

At the beginning of each iteration the researchers trained the teachers on the system and provided them with a document containing the full program's content and a list of the posts that would appear as the simulation unfolded. Each post was clearly marked as to which ones were relevant to the various threads of the storyline and which were not. This document also contained assignments and quizzes that the teachers could use in conjunction with the simulation.

Although teachers were given the same material and instructed in roughly the same way, the implementation of the second iteration differed significantly from the others. Indeed, in reviewing the responses to open-ended questions, a few students responded that they disliked or even hated ESL Silver. This strong reaction was the impetus for creating a teacher interview protocol that could explain the students' reactions. Discussion with the teachers revealed three types of issues, each crucial to the success of such a program of instruction:

1. The story itself,

2. Lack of classroom integration, and

3. A less than ideal presentation of the program as a whole.

The story had only been partially developed for the pilot (Iteration 1), but by Iteration 2 it was complete and fairly long with eight different threads that overlapped the others. The reaction of the students was to state that that they had been confused as to who was who and what was going on. Some also commented that the story was boring, which could have contributed to a lack of engagement on their part. The interviews with the teachers also revealed that the students did not relate well to the story and that they believed it to be too "gossipy." This comment was primarily related to the romance-based thread involving two of the characters, which was largely told through private messages to the students individually.

Through what was probably no fault of their own, it seems clear that some of the students were not sufficiently engaged in the simulation aspect of the experience and thus were not in the place to be receiving messages of a personal nature from someone they felt they did not know. While it might not be uncommon for friends to discuss romantic interests with each other, when such information comes from someone who is not a close friend, the communication may seem like gossip. This reaction could also be very much related to cultural differences. All aspects of the story related to the regular lives of college-age Americans, and the issues they dealt with were common ones, taken from the lives of and written by college-age Americans. Thus, it is quite possible that these elements of the story were too far outside the realm of experience of the foreign students, so they had trouble relating to and becoming engaged in what happened in the simulation.

Another issue with this iteration was related to classroom integration. The teachers did not use the resources that had been provided, and there was very little discussion of ESL Silver in the classroom. After the first few days of getting used to the software, students were simply told to read everything and that they would be quizzed on the reading. There were no specific assignments, nor did the teachers

mention ESL Silver in class other than to administer occasional comprehension quizzes. When the students asked why they were doing the program, the teachers responded that it was an experiment to see if something like this could work, and they "just had to." With this comment the teachers were in effect telling the students that it might not work, and thus perhaps even a waste of time. Attendance at the ELC requires a significant financial engagement, and students have the right to experience instructional techniques that have been shown to be effective. For the teachers to simply state that participation is required without providing any rationale as to why the experience is beneficial is a tacit admission that the experience has no specific purpose. This was especially unfortunate, given that ESL Silver was created specifically to correspond to the ELC curriculum and its stated objectives to help students achieve their goals in learning English.

The teachers' efforts to implement the system may be related to an aspect of this research not specifically explored in this article, which is the concept of "digital nativeness." With respect to the instructors, it is interesting to note that each of the two teachers who were part of this second iteration stated quite clearly in interviews that they were not as familiar with technology as they felt others were. They basically said that they used technology when necessary but that they were not the type to use it in every aspect of their lives. Teacher C also admitted that she had been skeptical at first of the value of the experience in which the students were to engage, but she also stated that her opinions had changed by the end of the experience. Unfortunately, it appears that by the time she understood the value of ESL Silver the teachers' actions and attitudes seem to have had already had a negative effect on the outcome.

Iteration 3

The next two iterations turned out much differently, reflecting what had happened during the first iteration. Positive reactions notwithstanding, the ESL Silver crashed twice during the third semester, causing the site to be inaccessible, which may have influenced some of the students' perceptions of the program as a whole. During Iteration 3, Teacher B, who had helped conduct ESL Silver during the pilot study, returned to participate. Her familiarity with the program no doubt contributed to its success with her attention to such simple elements as giving regular assignments and administering quizzes. Students routinely accessed the system in the lab during class time, and there was frequent discussion of the story as well as use of blog posts to learn and practice specific language skills (e.g. reading strategies and grammar principles). During the interview after this iteration, the teacher expressed her belief in the significant value in this type of experience. This may have prompted her to promote its use to her students in a way that was most likely more motivating for her students than for those who had participated in Iteration 2.

This positive experience underscores the obvious conclusion that teachers who are well trained and experienced with the implementation of any particular instructional technique will be more effective in putting it into practice. Although all of the other teachers had received training and guidance, there is no substitute for experience. Nevertheless, it is worth pointing out this same teacher began the first iteration with basically the same preparation as the others. One main difference, however, was that she had reviewed the design of the system for the ELC training directors as part of their decision to participate in the study. In that role she also provided guidance for the alignment of scope and sequence for ESL Silver with the curriculum at the targeted level.

Iteration 4

The fourth iteration of ESL Silver was the most successful with respect to student attitudes toward the program as measured by their responses on the post-survey as well as their observed use of the Web site. The biggest difference between this and previous iterations was the way in which the system was presented, addressing an important lesson learned from the second iteration. An important element in the teachers' preparation for this iteration essentially amounted to encouragement to the teachers to keep the program fun. The end result was that both teachers found a way to fit ESL Silver into their classes in a way that they felt would benefit the students. They kept the program structured, as it was designed to be and as was reaffirmed by the results received from Iteration 3, but they did not push it so hard that it became unenjoyable for the students.

To implement these principles, and in response to the fact that the teachers had other material to cover in their classes, they introduced ESL Silver more as a fluency activity that was to be enjoyed and not one to increase their stress level. The teachers assigned work for out-of-class activities and also provided some in-class time in the lab, although the overall experience was not as structured as previous iterations. All things considered, it appears that the primary purpose of the teachers' assignments for this iteration was meant to encourage the students to engage in fun practice using the target language. One of the teachers even posted regularly to the site, which resulted in an increase of posts in response to her comments.

When asked what they would improve about ESL Silver, students mainly provided feedback on system mechanics (complicated URL and the need for more attractive design). It seems like a positive development that these suggestions dealt more with superficial aspects of the program rather than the content or implementation. Indeed, in the writing class students on more than one occasion asked the teacher if it was time for ESL Silver yet, demonstrating a fairly high level of anticipation for the program.

The fact that two different classes used the same Web site meant that the story unfolded at the same time for both classes. Interestingly, it would appear that this approach created a sense of community that had a significant positive impact on the students' attitudes towards ESL Silver. We are inclined to conclude that the combined classes added to that sense of community, as did the personalization through the creation of blog posts by at least one of the teachers. Because the students did not follow the ESL Silver story as much during this semester as for the other iterations, it is possible that creating their own stories was more valuable to them.

Lessons Learned and Recommendations for Future Research

Some of the lessons learned in this project were unanticipated yet nonetheless important. Concerning the technology itself, system crashes during Iteration 3 demonstrate that it is impossible to plan for everything that might happen when using technology, but the importance of reliable software and hardware cannot be overstated. Basically, this means that not only should systems be thoroughly tested before actual implementation, but also that adequate support for the technology must be present in the event that something does go wrong so that it can be fixed without delay.

No doubt the most important lesson learned in this study is the confirmation of the well-known fact that any instructional technique is only as good as its implementation. The teacher's commitment and preparation are the crucial keys to any instructional innovation.

Another very important consideration has to do with the basic design of the system to avoid the overload that seems to have been an issue and the need to simplify the story. Essentially, three options present themselves:

1. Drop the story all together and focus on building the community

2. Stress the story a bit less and devise ways to increase the sense of community as was experienced by students involved in Iteration 4

3. Improve the quality of the story and increase the engagement required by the simulation and the roles that students play therein

The interviews with the teachers from Iteration 4 produced options 1 and 2, the first being suggested by the writing teacher. Because she did not deal with the story side of ESL Silver at all in her class, she proposed using the site through which the program was presented simply as a class blog.

There would be no storyline to follow, but rather the students would become the sole creators of the content. The teachers during Iteration 4 took it on themselves to implement this strategy, and the students who worked on the program in their writing class received regular assignments to write their own blog posts. They thereby became the creators of the story, not simply observer/participants. According to the teachers, students enjoyed writing back and forth to each other, which resulted in a number of posts beyond those that were required by the teachers. All of these factors contributed to a classroom community that brought students together in and out of the classroom where they could interact while simultaneously practicing language skills. That approach notwithstanding, one of the teachers did indicate that she would still have liked to use the ELGG site rather than Facebook because she liked the amount of control it afforded to her as the teacher.

Another possibility for a future iteration of ESL Silver was proposed by the reading teacher of Iteration 4. She stated that it would be nice to have a few days' worth of ESL Silver content on ELGG, which would serve as a model for the students to follow. They could read the material as they became familiar with the format of the website, and once they were comfortable in the digital setting, the students would take over the content creation for the site. Both of these options would continue to take advantage of the communicative capabilities of the site, although they would take away a large portion of what makes ESL Silver what it is.

The third possibility would be to improve the story recounted through the experience. The simulation was initially designed to contain two primary storylines involving three of the characters. In addition students learned about aspects of the lives of six other characters. This proved a bit overwhelming to the students in two ways. First was the sheer number of details relating to a total of nine people. Second was the fact that many of these details were related to the lives of American students, elements of a culture to which international students had significant trouble relating. Although the simulation was later simplified in Iterations 3 and 4 to focus on the primary storyline, it appears that the number of details was still too overwhelming for students not familiar with American culture. Future projects of this sort should address this important area. The teacher in the pilot indicated in her report, "Overall I highly recommend ESL Silver. It is a tool that can help students learn authentic language, while meeting the objectives of the reading curriculum. It can also meet the objectives of the Oral Communications and Oral Accuracy Class."

References

Antenos-Conforti, E. (2009). Microblogging on twitter: Social networking in intermediate Italian classes. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (35-58). San Marcos, Texas: Computer Assisted Language Instruction Consortium (CALICO).

Barab, S. & Squire, K. (2004). Design-based research: Putting a stake in the ground *The Journal of The Learning Sciences, 13*(1), 1-14.

Beauvois, M. H. (1997). Computer-mediated communication (CMC): Technology for improving speaking and writing. In M. D. Bush & R. M. Terry (Eds.), *Technology-enhanced language learning*, 165-184.

Blake, R. J. (2008). *Brave new digital classroom: Technology and foreign language learning.* Washington, D.C.: Georgetown University Press.

Bunderson, C. V., & Abboud, V. C. (1971). *A computer-assisted instruction program in the Arabic writing system* (Technical Report No. 4). Austin, TX: The University of Texas at Austin. (ERIC Document Reproduction Service No. ED052603)

Burns, H. (1984). The challenge for computer-assisted rhetoric. *Computers and the Humanities, 18*(3), 173-181.

Burston, J. (2003). Proving IT works. *CALICO Journal, 20*(2), 219-226)

Bush, M. D., & Browne, J. M. (2004). Teaching Arabic with technology at BYU: Learning from the past to bridge to the future. *CALICO Journal, 21*(3), 497-522.

Chapelle, C. A. (2010). The spread of computer-assisted language learning. *Language Teaching*, *43*(1), 66-74.

Chun, D. M., & Plass, J. L. (1996). Effects of multimedia annotations on vocabulary acquisition. *The Modern Language Journal, 80* (2), 183-198.

Conole, G. (2008). Listening to the learner voice: The ever changing landscape of technology use for language students. *ReCALL Journal*, *20*(2), 124-140.

Evans, M. (2009). *Foreign-language learning with digital technology.* London, England: Continuum.

Glennan, T. K. & Melmed A. (1996). *Fostering the Use of Educational Technology: Elements of a National Strategy*, RAND, MR-682-OSTP. Retrieved from the RAND Corporation Web site: http://www.rand.org/publications/MR/MR682/contents.html

Hamilton, M. (2009). Teacher and student perceptions of e-learning in EFL. In M. Evans (Ed.), *Foreign language learning with digital technology* (pp. 149-173). London, England: Continuum.

Kern, R. (2006). Perspectives on technology in learning and teaching languages. *TESOL Quarterly, 40*, 183-210.

Kinginger, C. (2007). Technology, telecommunication and foreign language teaching in the languages review consultation report: A view from the US. *Language Learning Journal*, *35*(1), 113-115.

Kulik, J. A., & Kulik, C. L. C. (1987). Review of recent research literature on computer-based instruction. *Contemporary Educational Psychology, 12*, 222-230.

Kurata, N. (2010). Opportunities for foreign language learning and use within a learner's informal networks. DOI: 10.1080/10749030903402032.

Kurisak, L. M., & Luke, C. L. (2009). Language learner attitudes toward virtual worlds: An investigation of Second Life. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 173-198). San Marcos, Texas: Computer Assisted Language Instruction Consortium (CALICO).

Lomicka, L., & Lord, G. (2009). Introduction to social networking, collaboration, and web 2.0 tools. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 1-11). San Marcos, Texas: Computer Assisted Language Instruction Consortium (CALICO).

Lyz, F. (2010). Looking back—A lesson learned: From videotape to digital media. *CALICO Journal*, *27*(3), 564-575.

Markee, N. (2005). Making curriculum innovation work: The role of information technology centers. In C. Davison (Ed.), *Information technology and innovation in language education.* Hong Kong: Hong Kong University Press.

McArthur, D. & Lewis, M. (1998). *Untangling the Web: Applications of the Internet and Other Information Technologies to Higher Education*. RAND, MR-975-IET. Retrieved from the RAND Corporation Web site: http://www.rand.org/publications/MR/MR975/

McBride, K. (2009). Social networking sites: Opportunities for re-creation. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (35-58). Texas: Computer Assisted Language Instruction Consortium (CALICO).

McFarlane, T. A., Hoffman, E. R., & Green, K. E. (1997). *Teachers' attitudes toward technology: Psychometric evaluation of the technology attitude survey.* Retrieved from ERIC database. (ED411279).

Mills, N. (2011). Situated learning through social networking communities: The development of joint enterprise, mutual engagement, and a shared repertoire. *CALICO Journal, 28*(2), 345-368.

Mitchell, I. (2009). The potential of the internet as a language-learning tool. In M. Evans (Ed.), *Foreign-language learning with digital technology* (pp. 32-59). London, England: Continuum.

Mitchell, K. (2012). A social tool: Why and how ESOL students use Facebook. *CALICO Journal, 29*(3), 471-493.

Muhammad, K. K., Ahmad, N. A., & Abidin, M. J. Z. (2010). *Internet and Higher Education, 13*, 179-187.

Nicholas, B. J., Rossiter, M. J., & Abbott, M. L. (2011). The power of story in the ESL classroom. *The Canadian Modern Language Review, 67*(2), 247-268.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, *9*(5), 1-6.

Quinn, C. N. (2005). *Engaging learning: Designing e-Learning simulation games* (1st ed.). San Francisco, CA: Pfeiffer.

Savignon, S. J., & Roithmeier, W. (2004). Computer-mediated communication: texts and strategies. *CALICO Journal, 21*(2), 265-290.

Schank, R. (1990). *Tell me a story*. New York: Charles Scribner's Sons.

Shih, R. (2011). Can Web 2.0 technology assist college students in learning English writing? Integrating "Facebook" and peer assessment with blended learning. *Australasian Journal of Educational Technology, 27*(5), 829-845.

Stockwell, G. (2007). A review of technology choice for teaching language skills and areas in the CALL literature. *ReCALL Journal*, *19*(2), 105-120.

--. (2010). Effects of multimodality in computer-mediated communication tasks. In M. Thomas & H. Reinders (Eds.), *Task-Based Language Learning and Teaching with Technology*. New York, NY: Continuum.

Stockwell, G., & Tanaka-Ellis, N. (2012). Diversity in Environments. In G. Stockwell (Ed.), *Computer-assisted language learning: Diversity in research and practice*. Cambridge, UK: Cambridge University Press.

Vesisenaho, M., Valtonenen, T., Kukkonenen, J., Havu-Nuutinenen, S., Hartikainen, A., & Karkkainen, S. (2010). Blended learning with everyday technologies to activate students' collaborative learning. *Science Education International, 21*(4), 272-283.

Wang, L. (2005). The advantages of using technology in second language education: Technology integration in foreign language teaching demonstrates the shift from a behavioral to a constructivist learning approach. *Technological Horizons in Education (T.H.E) Journal*, *32*(10), 38.