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Constructing a 'third space' for EFL learners: Where language and cultures meet

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Abstract

Efforts have been made by language educators and researchers to use computer technology to assist L2 learners' growth in either linguistic or intercultural competence. Nonetheless, web-based environments devoted to developing both types of competences in tandem are new and experimental. The purpose of this project, which involves the collaboration of EFL educators and computer engineers in Taiwan, is to establish an innovative web-based environment to support students in tertiary levels to develop both types of competences. This web-based EFL learning environment experiments with a few main features: (1) instead of reading articles about a foreign culture, the users of this website read articles about their native culture; (2) two on-line computer-based support tools, a bilingual concordancer and a dictionary, are made available to provide students with contextual supports for language learning; and (3) discussion boards are provided for intercultural communication. The web-based learning environment contains several instructional units. While working on a unit, students read an article and then answer comprehension and vocabulary questions. After reading, students share their responses to the articles with intercultural conversation partners via online forums. To evaluate the effectiveness of the learning environment, the researcher recruited a group of Taiwanese university students to test-use the system. Frequencies of the uses of the two e-referencing tools were calculated. The students' responses to a questionnaire were examined and informal interviews with the students were conducted. Finally, the students' forum entries were analyzed. The findings revealed initial interest in using e-referencing tools but a dramatic decrease in use after the first few units had been completed. The students used the concordancer as a link to extensive reading materials and suggested adding pronunciation tools to the dictionary. Questionnaire findings showed that students were generally satisfied with the design of the web-based learning environment. An analysis of the students' forum entries revealed increases in the length and complexity of sentences in their writings, as well as reductions in grammatical errors, as more units were completed. As for intercultural learning, the content analysis of the forum entries demonstrated different types of intercultural competences. Based on the findings, some implications for revision of the virtual environment to enable more effective learning of English as a foreign language and greater development of intercultural competence are drawn.

Keywords: web-based learning environment, e-referencing tools, intercultural learning, EFL

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1. Introduction

Theories of second language (L2) pedagogy suggest that teachers should provide their students with opportunities to learn the target language in communicative and meaningful contexts (Larsen-Freeman, 2000; Rex, 2003, Savignon, 1991). Subsequently, the communicative approach to language teaching redirected language educators' attention to the importance of culture in the L2 curriculum (Canale & Swain, 1980; Seelye, 1988). The use of computer technology and e-projects (i.e., projects that use electronic media to provide teachers and students with extended opportunities for L2 and foreign language teaching and learning) are thought to be beneficial in fostering L2 students' communicative as well as intercultural competence (Kern, Ware, Warschauer, 2004; Warschauer & Kern, 2000). Recently, efforts have been made by language educators and researchers to use computer technology to assist L2 learners' growth in either linguistic or intercultural competence (Belz, 2002; 2003; Furstenberg, Levet, English, Maillet, 2001; Müller-Hartmann, 2000; O'Dowd, 2003; Thorne, 2003). Comparatively speaking, developing web-based environments where both types of competences are facilitated in tandem is not only new but experimental. The small amount of material available for the development of both cultural awareness and communication skills is mainly on CDROM (Brett, 2000; Franklin, Pfaff, Reichelt, 1997). This project, which involves the collaboration of EFL educators and computer engineers in Taiwan, employs an approach of establishing a web-based environment to support EFL students in tertiary levels in developing both types of competencies. This paper describes the rationale underlying the design of the environment, the process of developing the website, and the preliminary findings of the effectiveness of the project.

2 Rationale

Nowadays the teaching of L2 reflects a convergence of communicative language approach and grammar instruction. Meaningful uses of language and grammar teaching are not mutually exclusive (Thompson, 1996). Supporters of communicative approaches argue that asking students to focus their attention on grammar could slow down, or even hinder, the process of acquisition (e.g., Krashen, 1981). However, other theorists believe that learners can be guided first towards understanding and responding meaningfully to the target language, and subsequently toward noting and describing the grammatical rules whose meaning they have understood, even if they do not necessarily recognize grammatical structures (e.g., Ellis, 1992). L2 teaching therefore, can achieve a balance between communicative language use and an awareness of grammatical structure. Learners may gradually assimilate grammatical rules over time by paying attention to them as they encounter them. Accordingly, an understanding and awareness of how the target language is used in its environment can help learners cope with the task of coming to terms with the language; this understanding can be most effectively developed by conscious, guided scrutiny of the language at work.

The communicative approach not only influences the teaching of grammar but also the teaching of culture in many L2 classrooms. Based on the belief that communication is not only an exchange of information but also a value-laden activity, learners are encouraged to assume the role of target language speakers so that they can gain insights

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into the values and meanings of the target culture (Byram & Morgan, 1994). In addition, L2 students need to cultivate an awareness of their own and the target culture, and be sensitive to the meeting of cultures that often takes place in communication situations in the target language (Kramsch, 1993).

With the advance of computer technologies, language educators are increasingly using the Web and other computer resources in their teaching. Felix (2002) asserts that human-machine interfaces offer an environment for interactive learning that can foster the acquisition of communicative skills and cultural competence (Shawback & Terhune, 2002). The World Wide Web provides a space in which teachers who are technically adept may set up tasks that engage students in stimulating and goal-oriented language learning. Although most currently available materials which integrate cultural awareness and communication skills are on CD-ROM (Brett, 2000; Franklin, Pfaff, Reichelt, 1997), Web use has become increasingly popular. Intercultural projects are considered to have the potential to enhance learners' communication skills and their knowledge of another culture, as well as their own culture from another group's perspectives (Kern, 2006). For example, The EU-funded LANCAM (Languages for Contract Administration and Management in Construction) project offers web-based materials to help business managers in the construction industry to understand the key aspects of European work culture and practice and to enhance their professional language skills (Rogerson-Revell, 2003). Another project, Cultura, brought students at the Massachusetts Institute of Technology in Cambridge, U.S.A. and the Institut National des T_l_communications in Evry, France, together via a network forum to collaborate on observing, comparing, and analyzing parallel materials from their respective cultures (Furstenberg, Levet, English, & Maillet, 2001). The Cultura project demonstrated how networked communication could be used to develop foreign language students' understanding of other cultural attitudes, concepts, beliefs, and ways of interacting and viewing the world.

In addition to the Web, the integration of corpus linguistics and computer technology is another exciting way in which language educators can fulfil their pedagogical goal of balancing grammar and communicative teaching, as well as infusing culture into language learning. An important function of corpora in the language classroom is to provide learners with concentrated exposure to particular patterns of repetition. The use of computer technology in corpus linguistics allows for automatic searching and sorting of text. With the use of corpus tools, namely computer-based concordancers, language learners do not have to rely on oversimplified grammatical rules prepackaged by teachers or textbook writers. They can gradually develop proficiency through the focused, purposeful exposure to, and the use of, language in specified contexts (Teubert, 1996). They can also use them to identify academic vocabulary relevant to their field of study (Donley & Reppen, 2001) and even to examine the context in which the vocabulary occurs. Language teachers can use computer-based concordancers to find texts with a suitably high proportion of target words and then create an order for teaching these texts (Ghadirin, 2001). Besides helping language learners to take note of the linguistic contexts in which words are used, concordancers also help students to highlight the language features in cultural-specific contexts. By studying different corpora, students can compare and contrast language uses in different cultural contexts for various communicative purposes. For example, Leech and Fallon (1992) used KWIC (Key Words in Context) concordances of two corpora to investigate the senses in which

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words were being used in England and the United States. In another study, Bertaccini and Aston (2001) used a variety of CD-ROMs and Internet searches to form a target language corpus so that students could engage in culture learning. Thompson (2001) used parallel corpora of familiar genres as the basis for language awareness activities and helped learners explore the ways in which language is deployed in the foreign language to achieve particular communicative goals. He also led the students in the discussion of aspects of the other culture as reflected in the language.

The use of computer technology in corpora studies has diversified the application of corpus linguistics in the language classroom and concordancers are viewed by many as one of the most promising tools in the recent development of computer-assisted language instruction (Barlow, 2002; Biber & Conrad, 2001; Cobb, 1997, 1999; Tribble & Jones, 1997). Since the application of computer technology in corpus linguistics provides language teachers and students alike with opportunities to explore the various pathways that lead to communicative language and culture learning, the integration of custom-made tools into Web-based environments to meet the specific needs of L2 students would logically be the next step to take. As a matter of fact, such integration has already begun. For example, in Japan, Narita, Kurokawa, and Utsuro (2003) have developed a corpus-based language support tool to respond to the English writing needs of Japanese software engineers. Using a tagged corpus, they designed a prototype on both a Unix-based workstation and on the Web and evaluated its usability. Using an English-Chinese parallel corpus, Wang (2001) developed a computer program, English-Chinese parallel corpus concordancer for both English and Chinese learners. In Taiwan, Sun (2003) designed and implemented a reading program which offered an online reading platform with concordancer help, stage-by-stage reading strategy training, and text annotation functions for her college level reading class. Also in Taiwan, the CANDLE (Corpora and NLP for Digital Learning of English) project, sponsored by the National Science Council, has developed various natural language processing (NLP) tools for the purpose of facilitating English learning for intermediate and advanced learners in Taiwan (Liou, Chang, Yeh, Liaw, Lin, Chen, You, Chuang, & Gao, 2003; Liou, Chang, Chen, Lin, Liaw, Gao, Yeh, Chang, &You, 2006).

3 Purpose of the Study

This researcher, a member of the aforementioned CANDLE project team, obtained technical support from the engineers of the project and permission to use the NLP tools to construct an environment to support the development of the English linguistic and intercultural competence of tertiary level EFL students in Taiwan ---a space where intercultural communication could take place. It was hypothesized that with the design grounded in language learning theories and the help from cutting-edge computer technology, EFL students who used the web-based learning environment would grow in both their linguistic and intercultural competence. Thus, this e-learning environment would be a virtual “third space” for EFL learners.

To examine the effectiveness of the e-learning environment, a small-scale pilot was conducted. The following describes the design and implementation of the e-learning environment, the preliminary findings of the pilot study, and

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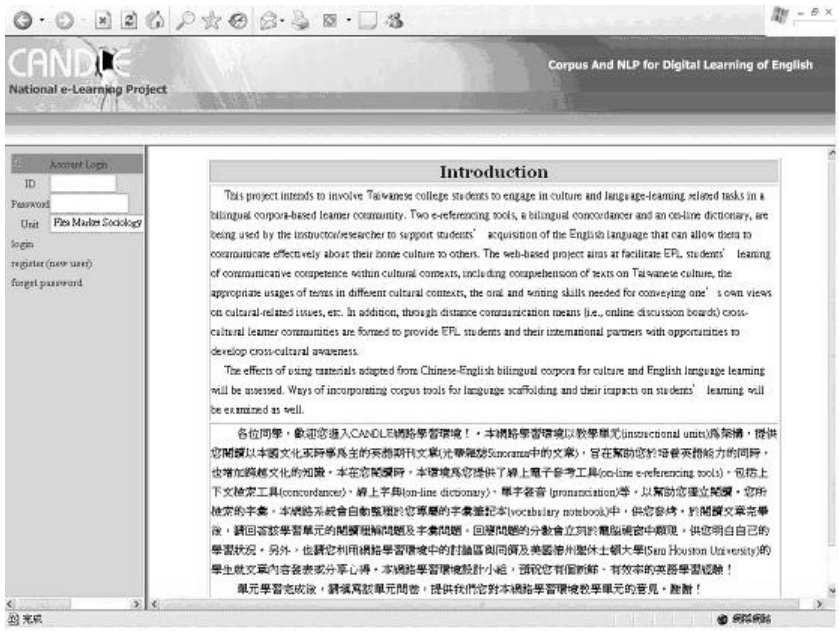


Fig. 1. Screenshot of the project website

finally, the implication of the findings and how these findings could benefit future revisions and improvement of the virtual language and intercultural learning environment.

4 The Project Design

The design of this project attempts to strike a balance between the development of communicative language competence and grammatical accuracy. Fostering the growth of tertiary level EFL students' intercultural awareness is another important objective of this project. It attempts to cultivate "intercultural speakers", as defined by Byram and Fleming (1998: 8) so that the users of the environment can "establish a relationship between their own and other cultures, to mediate and explain differences – and ultimately to accept that difference and see the common humanity beneath it." In an attempt to reach the above aims, this web-based EFL learning environment experiments with a few main features: (1) instead of reading articles about a foreign culture, the users of this website read articles about their native culture; (2) two on-line computer-based support tools, a bilingual concordancer and a dictionary, are made available to provide students with contextual supports for language learning; and (3) discussion boards are provided for intercultural communication. This web-based learning environment contains several instructional units. Each unit consists of an article, five comprehension questions, five vocabulary questions, and a forum for intercultural discussions. After reading each article, students answer the comprehension and vocabulary questions and write responses to their intercultural conversation partners. At the time of the

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implementation of the system, four instruction units had been constructed. The reason for having four units was based on the academic calendar of the semester. In Taiwan, normally there are 18 weeks in one semester. Excluding the two weeks for midterm and final exams, the students could easily schedule their uses of the system into four weeks per unit. The URL of the website is: http://candle.ntcu.edu.tw/candle. See Figure 1 for the screenshot of the website.

4.1 The selection of reading passages

Communication situations are now seen as encounters between the learner's culture and that of the target culture; communicative competence involves "appropriate language use which, in part at least, is cultural specific" (Byram, 1989: 61). Students need to gain insights into both their own culture and the target culture, and be aware of the meeting of cultures that often takes place in communication situations in the target language (Kramsch, 1993). Learners must first become familiar with what it means to be part of their own culture and by exploring their own culture, i.e., by discussing the values, expectations, traditions, customs, and rituals they unconsciously take part in, they are ready to reflect upon the values, expectations, and traditions of others with a higher degree of intellectual objectivity (Abrams, 2002; Straub, 1999). In this project, therefore, the reading materials consisted of articles about the students' own culture, so they were provided with contextual familiarity while creating the "third space" (Kramsch, 1993), where their home culture and the target culture met.

For this project, the articles were selected from Taiwan Panorama , an official monthly magazine published by the Government Information Office of the Republic of China. Taiwan Panorama is very popular because of its in-depth reports on the lifestyles, society, economy, and cultures of Taiwan. To ensure that the articles in Taiwan Panorama would be of the appropriate proficiency level for the target users of the website, before the actual project began, a group of university freshmen was asked to read hard copies of three Taiwan Panorama articles as a trial. They were told to read the articles without looking up any words in the dictionary or using any reference tools. However, when they could not figure out the meaning of certain words from context or felt like looking them up in a dictionary, they were allowed to circle those words. The results showed that the articles were not too difficult for the students; the average percentage of the words that the students found unfamiliar in the three articles was less than 10%. Thus, the articles in Taiwan Panorama represent what Ghadirin (2001) considers as reasonably comprehensible authentic texts in a target domain. Finally, four articles were chosen for the project: Goodbye, Marian (word count: 970, Flesch-Kincaid grade level[2] 8.4), The Flea Market Sociology (word count: 1,783, Flesch-Kincaid grade level: 8.3), Questions and Answers on Children's Classical Studies (word count: 997, Flesch-Kincaid grade level: 11.3), and Sketches of Dreams amidst Generational Change

1. Taiwan Panorama used to be Sinorama. It was re-entitled Taiwan Panorama in June, 2006.
2. Flesch-Kincaid Readability Test, devised by Rudolf Flesch, is a quick and easy way to determine the readability of various books and texts. Flesch-Kincaid Grade Level rates reading materials based on U.S. grade levels; for example, a score of 6.1 would indicate that the text is understandable by an average student in 6th grade.

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(word count: 2,426, Flesch-Kincaid grade level: 12.0). Both the length and readability were taken into consideration and the difficulty levels of the articles gradually increased.

4.2 The development of corpora-based e-referencing tools

For the reading of Taiwan Panorama articles, two corpora-based e-referencing tools were provided: a Taiwan Panorama-based bilingual concordancer, TOTALrecall (Wu, Yeh, Chuang, Shei, & Chang, 2003)[3] and an online dictionary. The linguistic and semantic support provided by the tools was expected to help learners to acquire new vocabulary (Fraser, 1999; Zahar, Cobb, & Spada, 2001) and to exercise their ability to use contextual clues to read authentic texts on culture (Cobb, 1999). In addition, it was believed that the more familiar students become with corpus-based learning tools, the more efficiently and effectively they are likely to use them when writing intercultural forum entries.

TOTALrecall is a web-based English-Chinese concordance system which allows users to submit queries for single words, phrases, expressions, or even full sentences (see Figure 2). It is based on a bilingual corpus consisting of selected Chinese-English articles published in Taiwan panorama magazine from 1995 to 2002. Currently there are approximately 50,000 bilingual sentences and over 2 million words in total in the database, and it will be expanded in the future. The user can control the maximum number of search hits and once a query is submitted,

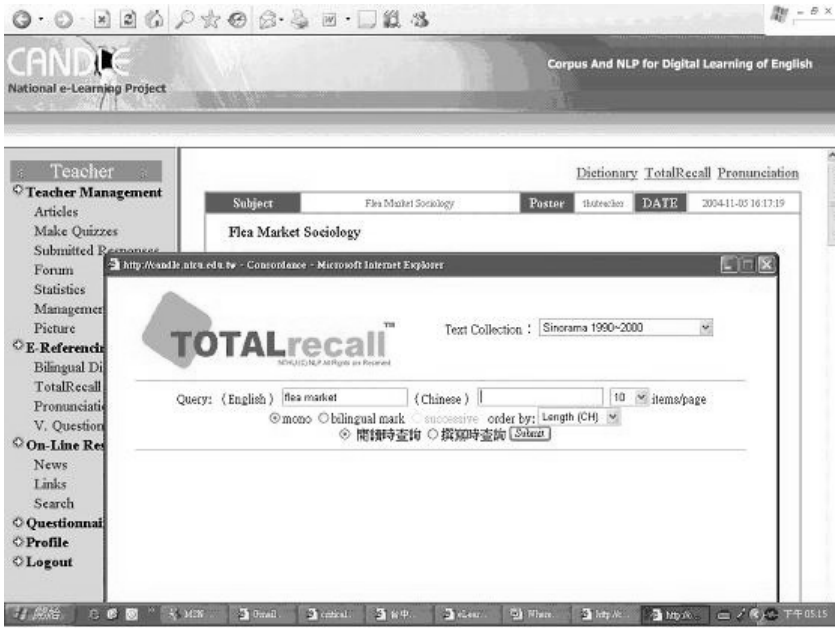


Fig. 2. The use of TOTALrecall

3. The bilingual concordancer, TOTALrecall, is the product of another sub-project of CANDLE.

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Fig. 3. The online dictionary

TOTALrecall displays the results in two separate columns, English and Chinese, on a window of a Web page. The words matching the query are highlighted and hyperlinks are provided so that users can view the original documents of the search results if they choose to do so.

The online dictionary was created by the Department of Electrical Engineering at Tamkang University in Taipei, Taiwan, and is available to the public free of charge (http://www.ptsgi.com/chinese_tw2/dictionary/dictionary.html). A link to this Chinese-English bilingual on-line dictionary has been created in the web-based learning environment of this project. With a click on a button, the dictionary appears on the screen. Users can type in either Chinese characters or English words and a list of the equivalents of their translations in the other language is then provided (see Figure 3).

The queries submitted to TOTALrecall and to the online dictionary are archived in individual user vocabulary notebooks. The learners can use their online notebooks to keep track of and review the words they have looked up.

4.3 Intercultural Forum

To allow students to post their responses to the reading, online forums were constructed as part of the web learning environment. The forums were created by using an open source bulletin board package, phpBB.[4].

4. Details about the package can be obtained from http://www.phpbb.com/

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Table 1 *Frequency of Uses of E-Referencing Tools*

		Unit 1	Unit 2	Unit 3	Unit 4	Total
Reading	Dictionary	704	952	1	89	1746
	Condordancer	12	30	0	32	74
Writing	Dictionary	12	36	1	3	52
	concordancer	1	2	0	0	3
Total		729	1020	2	124	1875

4.4 The management system

In order to keep records of the students' uses of the web-based learning environment for research and future revision purposes, a personal account management system was built in. After registration, students then use their own IDs and passwords to log in. The account system allowed both the user and the instructor to keep track of the students' uses of the system, the words that had been looked up using the online dictionary and concordancer, comprehension test scores, written responses to the reading, and intercultural forum entries.

5 Implementing the system and preliminary findings

5.1 System implementation

In order to understand the usefulness of the web-based EFL learning environment, the researcher recruited a group of sixteen freshmen majoring in Foreign Languages and Literature at a university in central Taiwan to test-use the system. In Taiwan, all students must complete at least six years of English instruction at junior and senior high school level prior to entering a university. The students who took part in this study had completed this requirement.

Although the students did not have any prior experience of using web-based environments for language learning, they all knew how to use the Internet. Therefore, after a brief orientation to the system and explanations of the functions of the e-referencing tools, the students were able to access the system independently without any difficulty. The students used the system outside of class and proceeded at their own pace. The only instruction they received from the instructor/researcher was to explore all of the features that the website provided, and to finish the readings and answer all the comprehension questions and questionnaire items by the end of the semester. In addition, the students were to share their views about their reading with a class of thirty-two students at Sam Houston State University in Texas, U.S.A. The students at Sam Houston were prospective ESL/bilingual education teachers taking a multi-culture education class. At the time of the project implementation, their instructor was looking for intercultural e-pals for them. The forums in this online intercultural learning environment therefore served as a timely "third space" for the two groups of students across the Pacific Ocean. Both groups were informed and verbal agreements were

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Table 2 *Summary of Questionnaire Findings*

Question		M	SD
1. I enjoy reading the article in this unit		3.7	0.9
2. This unit can help me improve my English reading comprehension.		4.0	0.9
3. This unit can help me learn English vocabulary.		3.7	0.5
4. This unit can help me improve my English writing skills.		3.3	0.9
5. This unit can help me become aware of Taiwanese culture.		3.7	0.9
6. This unit can help me learn how to introduce Taiwanese culture to foreigners.		3.7	0.8
7. This unit helps me to become sensitive about cross-cultural differences.		3.7	0.7
8. Which part do you like about this unit?			
	Reading the articles	16	
	Totalrecall	6	
	Dictionary	10	
	Quiz	10	
	Vocabulary notebook	12	
	Forum	14	

obtained that the data would be used for research purposes and for revising the web-based learning system.

The data collected and analyzed included: (1) calculation of the frequency of use of the two e-referencing tools, (2) the students' responses to a questionnaire that was included in the system, (3) informal interviews with the students, and (4) the students' forum entries. Since the study was on the effectiveness of the system for EFL students' English and intercultural learning, only the data collected from the Taiwanese students were analyzed.

5.2 Findings

5.2.1 Frequency of use of e-referencing tools.

Examination of the personal record systems showed that the students used the on-line dictionary more frequently than the concordancer and that there was a dramatic decrease in the number of uses over time. The students used e-referencing tools 716 times (an average of 44.7 times per student) when reading the first article, 982 times when reading the second article (an average of 61.4 times per student), once when reading the third article, and 121 times when reading the fourth article (an average of 7.6 times per student). Even though the students were allowed to use the tools when writing, the number of uses were quite low (online dictionary, N=52; concordancer, N=3). Based on a usage comparison of the two e-referencing tools, the students used the dictionary 1,798 times (1,746 times when reading and 52 times when writing) and the

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concordancer, TOTALrecall, 77 times (74 times when reading and 3 times when writing). The highest number of uses of the e-referencing tools occurred when the students were reading the second article (N=982). See Table 1 for frequency of uses of e-referencing tools.

5.2.2 Responses to the questionnaire

The students' answers to a built-in questionnaire (see Figure 4) revealed positive reactions. Answers to the 5-point Likert scale questions (range: 1=strongly disagree with the statement to 5=strongly agree with the statement) showed that the students enjoyed reading the articles (M=3.7, SD=.9) and found them to be interesting. They thought that the system helped them to improve their ability to read English (M=4, SD=0.9) and expand their vocabulary (M=3.7, SD=0.5). As to whether the system helped them improve their writing skills, the students also gave positive reactions in general (M=3.3, SD=.9). Their responses (recorded after the completion of units) regarding whether the websites helped them learn about Taiwanese culture (M=3.7, SD=.9), introduce Taiwanese culture to foreigners (M=3.7, SD=.8), and gain a better understanding of cross-cultural differences (M=3.7, SD=.7) were similarly positive. Table 2 summarizes the questionnaire findings.

The open-ended questions also revealed interesting findings. When asked which parts of the web-based instructional units they liked the most, the students answered that they liked reading the articles the most because the articles were very interesting. They found

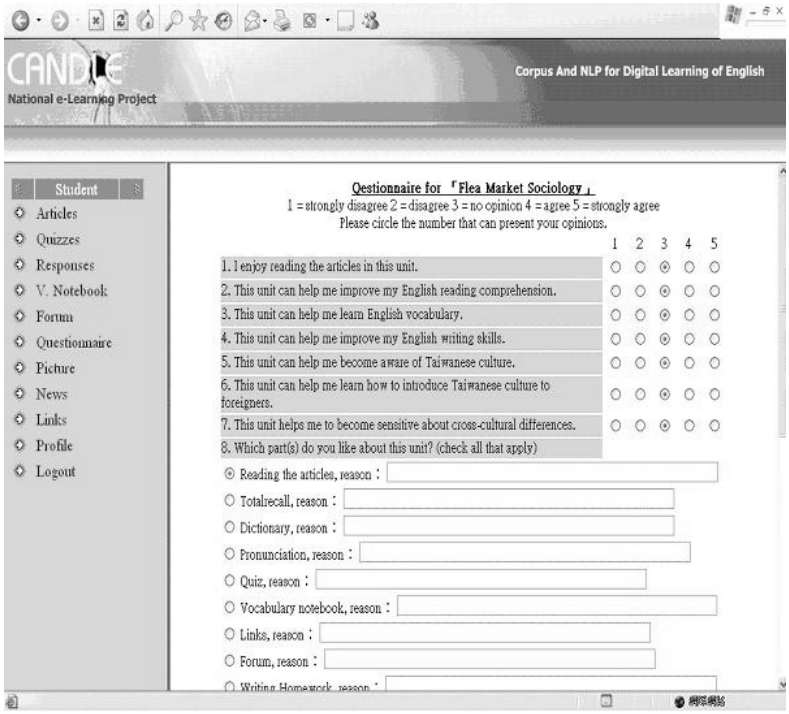


Fig. 4. Questionnaire for "Flea Market Sociology"

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the topics relevant to their experience and thus more meaningful. The articles were considered suitable for intercultural communication since the students could relate to the issues and could share their own views with their partners. Due to familiarity with the discussion topics, the EFL students found the intercultural communication exciting yet not intimidating; hence the forum was ranked second. The vocabulary notebook was the third most popular item among the various functions. The students thought that the notebook helped them review the words they had just learned. According to the results, the quizzes and the on-line dictionary shared fourth place in students' estimation followed by the web learning environment. The concordancer, however, was ranked last among the various features of the web-based learning environment.

5.2.3 Informal interviews with the students

Although the questionnaire findings revealed some information regarding the students' likes and dislikes regarding web-based learning, the findings did not reveal much about why the students decided to use or not to use the e-referencing tools. However, from the informal interviews, further information was elicited.

Although there were novelty effects while they first tried out the e-referencing tools, they quickly found that the online dictionary was no more convenient than the pocket electronic dictionary that they were familiar with; both on-line dictionary and pocket electronic dictionary required keying in the words they wanted to look up. They also pointed out that most pocket-size dictionaries were equipped with pronunciation functions whereas the on-line dictionary was not, and this greatly affected their use of the tool. To improve the on-line dictionary, the students suggested mouse-over for meanings and the inclusion of a pronunciation tool.

Regarding the concordancer, they found that it could actually be used as links to articles related to the same topic. TOTALrecall, a domain-specific e-referencing tool, provided not only sentences containing the vocabulary items but also links to other Sinorama articles from which the sentences had been taken. The students, after looking up words, linked to the various articles from which the example sentences containing the words were extracted. For instance, one student, after looking up the term "flea market," followed links to several articles on different types of markets in Taiwan. The system only recorded the one time when the student looked up the term "flea market" but failed to track the student's links to and reading of related articles, since links to those articles were not parts of the learning environment.

Besides the problems with the design of the e-referencing tools, increased confidence in the students' English ability was another reason for the reduced usage of the e-referencing tools. After finding that their U.S. e-pals could understand their "poor" English, the students stopped worrying about their English ability while writing. Looking up words using the e-referencing tools was no longer considered necessary.

5.2.4 Students' forum entries

The students' forum entries were analyzed to gain an understanding of students' growth in linguistic competence and intercultural awareness. For linguistic competence, the entries were analyzed in terms of length, structural complexity, and grammatical accuracy. Intercultural awareness was qualitatively analyzed by applying guidelines for assessment of intercultural experience (Byram, 2000).

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The students in the two universities posted and replied to a total of 371 entries (Taiwan students N=144; U.S. students N=227). The Taiwanese students' entries fell into three major categories: greetings (N=50), responses to articles (N=92), and farewell messages (N=2). The average number of words per entry was 83.9. The length of entries for greeting and farewell messages was much shorter than the responses to articles; the average number of words per greeting entry was 51.6 words and the average number of words for farewell messages was 40. The responses to the four articles were of similar length (Goodbye, Marian – 102.4 words; Flea Market Sociology – 95.6 words; Questions and Answers on Children's Classical Studies – 104.3 words; Sketches of Dreams amidst Generation Change – 116.2 words) but with slight increases. In addition to analysis of entry lengths, the students' writings were also analyzed in terms of Flesch-Kincaid grade levels for structural complexity. An increase in their readability levels was also found (Goodbye, Marian – M= 4.7, SD=1.5; Flea Market Sociology – M=6.5, SD=0.3; Questions and Answers on Children's Classical Studies– M=7.2, SD=0.8; Sketches of Dreams amidst Generation Change – M=6.5, SD=1.1). A one-way repeated measures ANOVA was conducted to examine the differences between the entries related to the different articles. A significant effect was found ($F=11.73$, $p<.001$) and follow-up comparisons showed that the mean scores of the first article entries were significantly lower than those of the others, whereas no significant differences were found among the readability levels of the other entries. As for the grammatical errors made in the entries, Microsoft Word Grammar Check was used to investigate the types[5] and numbers of errors. It was found that the average number of errors per entry decreased as more entries were written (Goodbye, Marian – 10.5; Flea Market Sociology – 6.1; Questions and Answers on Children's Classical Studies – 6.1; Sketches of Dreams amidst Generation Change – 3.6). The entries related to the first reading article contained the highest number of grammatical errors and those related to the last article contained the least.

The forum entries were read by this researcher and a graduate student for indications of intercultural awareness using Byram's assessment criteria (2000).[6] Total agreement on the categorization of each entry was reached between the readers before the category was assigned. While most entries demonstrated more than the characteristics of one single category, the researcher decided to list only those categorizations which seemed to be more obvious than the others. After careful examination, it was found that among the entries written by the Taiwanese students, most of the entries (N=121) demonstrated "knowledge about another country and culture." They also showed "interest in other people's way of life" (N=30). The number of entries that show "ability to change perspectives" (N=2) and display "knowledge about intercultural communication" (N=4) were quite small.[7]

5. The grammar types checked included adjective use, article use, capitalization, comparative use, extra word, fragment, number agreement, punctuation, reference pronoun, space, spelling, subject/verb agreement, verb form, and wordiness.
6. The criteria included: a) interest in other people's daily life experiences, b) ability to change perspective, c) ability to cope with living in a different culture, d) knowledge about another country and culture, and e) knowledge about intercultural communication.
7. For a more detailed examination of the intercultural forum entries, please see Liaw (2006).

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6 Conclusions and discussion

This project attempts to construct a virtual environment to support students at tertiary level to develop both English language and intercultural competence. This web-based environment contains four instructional units. In each unit, students are asked to read an article on their own culture with the help of two e-referencing tools. They also have the opportunity to discuss their responses to the articles with e-pals through intercultural forums. To evaluate the effectiveness of the learning environment, a group of Taiwanese university students was recruited to test-use the system. Frequencies of the uses of the two e-referencing tools were calculated. The students' responses to a questionnaire were examined, and informal interviews with the students were conducted. Then the students' forum entries were analyzed. The findings showed that of the two e-referencing tools, the online dictionary was more frequently used than the concordancer. Students used the tools most often when working on the second unit. The students suggested adding a pronunciation feature to the dictionary and they used the concordancer as a link to extensive reading materials. The questionnaire findings show general satisfaction with the web-based learning environment because students could read and learn about their own culture in English. In addition, students responded positively to the design of the various features of the e-learning environment. An analysis of the students' forum entries revealed increases in the length and sentence complexity of their intercultural written exchanges, as well as reductions in grammatical errors, as more units were completed. As for intercultural learning, the content analysis of the forum entries demonstrated different types of intercultural awareness.

These positive findings are encouraging. Although the relationship between the students' growth in English language and intercultural awareness and the uses of the web-based environment should be interpreted carefully, it is evident that the use of the communicative approach for both language and intercultural learning can be realized in a web-based environment. In this domain-specific e-learning environment, reading and writing activities were contextualized in intercultural and communicative settings where corpora-based referencing tools were accessible. The use of e-referencing tools decreased rapidly as the students gained confidence in their ability to communicate with intercultural e-pals. Another possible reason for the infrequent use of e-referencing tools might have been the suitability of difficulty levels of articles and the familiarity of topics. Such a virtual learning environment may not be the "best version" of a computer-assisted learning environment as described by Felix (2002); however, it provided students with a certain level of comfort and security for real uses of the target language. Comfort and security are hard to come by for foreign language students who have very limited opportunities to communicate with native speakers in Taiwan unless they have a native speaking teacher. Using their own culture as a starting point and e-referencing tools as a support along the way for reading and writing in English on cultural issues gave the participating students a sense of confidence, which was quite valuable in EFL settings. It might even have facilitated their growth in English language proficiency, i.e., higher structural complexity and fewer grammatical errors in their intercultural forum entries. This result is similar to Blake and Zyzik's finding (2003) that the "non-inhibiting" mediation of the Internet decreased their students' anxieties about negative appraisals of their linguistic performance and enhanced their language output.

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Despite students' enhanced linguistic performance, it is important to keep in mind, as Kern (2006) points out, that language competence per se is not the key variable in the success of intercultural exchange projects; other factors, such as the willingness to be socialized into the online community and to follow its discourse rules play an important role in intercultural communication projects (Hanna & de Nooy, 2003). Participants must see an intercultural stance online as a joint responsibility in which individuals agree to stay engaged in the interaction (Ware, 2005). In this study, the intercultural forum entries revealed a self-regulated exchange pattern, including greetings, exchanging views on cultural topics related to the readings, and closing the intercultural exchanges at the end of the project. The participants demonstrated what Sercu (2004) suggests are the characteristics of "intercultural speakers": the participants were committed to turning "intercultural encounters" into "intercultural relationships." The intercultural relationships encouraged the display of different types of intercultural awareness as defined by Byram (2000).

Developing an awareness of the complex relationships between culture and its linguistic expression is extremely challenging for foreign language learners. Therefore, foreign language educators need to investigate ways of creating learning environments that promote sustained engagement in online communication, so that students can benefit from the kinds of intercultural encounters that technology has the potential to provide. Nevertheless, assessing the effectiveness of technology is problematic since a given technology may be used differently by different people (Zhao, 2003). The design of this online intercultural learning environment diverges from the well-worn path of leading students directly into the target culture; instead, it attempts to foster intercultural awareness by providing EFL students with opportunities to read and discuss cultural topics that they are familiar with. It is a well-known fact that culture is embedded in language. In this virtual "third space," language and culture are even more tightly intertwined since the EFL learners are informants of their own culture as well as learners of the other culture. Although the questionnaire findings of this study revealed positive responses from EFL students toward this approach, how it affected the students' role in the intercultural partnership, and their ability to use the target language for communication, needs further investigation.

The pedagogical value of integrating e-referencing tools in an online learning environment is another topic that deserves further investigation. The original aim of incorporating the corpus tools was to help learners acquire linguistic competence with both sentence level and discourse level assistance while they engaged in communicative activities. Nevertheless, the findings reveal that the students did not rely much on the e-referencing tools for reading, and relied on them even less for writing. Based on this finding, on the one hand, one can speculate that the writing in the project was interactive in nature, which provided many contextual cues by itself and therefore did not require the aid of the tools; on the other hand, one can question whether the design of the learning environment allowed for maximum use of the tools. In other words, the unique features of the corpus tools have not yet been fully exploited in the revision of the web learning environment. In addition to better integration of the tools into the modified version of the learning environment, perhaps demonstrations or guidance to help students take full advantage of the tools can also be provided in future implementations. In the present study, the students used TOTALrecall for extensive

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reading of articles related to similar cultural topics. Although this revealed the students' creativity, at the same time, it demonstrated their unfamiliarity with the functions of corpus tools. What effect some guidance in the use of the tools might have could, of course, be a topic for future research as well.

This virtual "third space" is still under construction and will continue to be updated. The experience of implementing this early version will be invaluable when revising the online learning environment. Although the findings of the study have, to a certain extent proved the hypothesis of the project, questions emerged after the data were analyzed and interpreted. These questions may be the starting point for future studies. As Narita, Kurokowa, and Utsuro (2003) concluded, the corpus-based approach to foreign language learning is pedagogically and academically promising.

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