

How Computers are Improving English Education in Japan

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The main goal of English students in Japan is to learn the language as quickly and enjoyably as possible, and, in this endeavor, the world of computers, software, Internet, and other multimedia offer a great deal of promise. These multimedia provide instantaneous links to various data. Vocabulary and grammar can be studied and reviewed at a learner's own pace. There can be unlimited, immediate feedback pinpointed to the specific errors made by a student. The student has privacy and is not singled out to speak in class. Materials can be designed to accommodate different learning-style preferences. By utilizing computers for tutorials and drills, class time can be dedicated to using language in real communicative situations. Last but not least, computers are often fun.

The purpose of this practical paper is to introduce some of the many ways in which Japanese students studying English can benefit from the world of computers. The current situation of Computer Assisted Language Learning (CALL) will be depicted with respect to the various skills often associated with language acquisition: listening, reading, vocabulary, writing, grammar, and speaking. Some high-quality Internet sites and software will be introduced. Finally, the current multimedia situation at Hiroshima University will be briefly described.

Listening

Numerous applied linguistics studies indicate that multimedia can improve English listening abilities. For example, Brett (1997) found that advanced students of English as a Second Language (ESL) had better listening comprehension and recall while using multimedia than either audio or video plus pen and paper. Two postulated reasons for this were that the media-delivered comprehension tasks seemed more efficient, and that immediate feedback to tasks aided comprehension. By "efficient", he refers to factors such as the speed of a mouse click, and the fact that when using only a video to answer listening questions, students must be looking down at their paper rather than at the helpful screen.

Internet offers many excellent sites for improving English listening skills. For example, Randall's ESL Cyber Listening Lab features numerous listening tasks set at three levels of ability (easy, medium, and advanced), and also is divided into listening for academic purposes, listening for general purposes, and watching RealVideo. BBC World Service and America's National Public Radio both offer current news reports accompanied by transcripts. Famous speeches in history can be heard and read at the History Channel site. For fiction aficionados, ghost stories can be heard and read at the Moonlit Road site.

Links to these listening sites and others are available at: <http://home.hiroshima-u.ac.jp/flare/EnglishStudySite2004.html> A lot of movie transcripts are available at <http://www.script-o-rama.com/trans.shtml>

One of the best sites for intermediate and advanced-level Japanese university students is Brian Teaman's Virtual University page, accessible at <http://home.hiroshima-u.ac.jp/~teaman/vu/index-e.html> Here, learners can watch videos and listen to young adults (mainly foreign students at Hiroshima University) talking about topics of interest to college students, such as general university life, dating, music, crime, and photography. Support materials include a bilingual dictionary and various kinds of quizzes. The materials are very authentic in that there was no coaching of interviewees. Yet, interview questions were carefully selected to elicit appropriate language. For details on how this site was constructed, see Teaman and Lauer (2002).

Teaman's project is important because the multimedia materials were actually used in a course, and the accomplishments of the students were analyzed (Teaman, 2003). It was found that some students made "great improvements in their listening abilities (p. 47)." Students claimed that the most desirable tasks were fill-in-the-blank exercises, studying lists of vocabulary items that accompany the transcripts, and reading transcripts while listening. They said the least desirable tasks were vocabulary synonym tests, vocabulary translation exercises, and exercises in which students had to unscramble words to form good sentences. Such findings can be used to make more effective multi-media exercises in the future.

Another good site which uses video is <http://www.real-english.com> It has interactive exercises based on dialogues recorded in London, Dublin, Atlanta, and elsewhere.

To prepare for the Test of English for International Communication (TOEIC) listening section, Hiroshima University students, for no charge, can listen to many practice questions at: <http://home.hiroshima-u.ac.jp/flare/TOEIC-prep/> According to user data, about 1,000 students have used the online TOEIC service during the past 2.5 years.

With respect to TOEIC software, ALC (アルク) has produced the following three pieces of software which have been praised by Hiroshima University students (Lauer, 2001b): TOEIC 実践模擬テスト (1996), CD-ROM 版 TOEIC テストスーパー模試600問 (1998), and TOEIC テストパーフェクト730点 (1999). Also Kyoto University administrators (2000) praised *TOEIC Super Training* 470, 730 (ASCII: 1995).

Among the most popular general listening software cited by the Hiroshima University students in the above study were the interactive stories *Beverly 90210* (Sourcenext/Softrade:1998), *Murder She Wrote* (ASCII/Softrade: 1995), and *Columbo* (ASCII/Softrade: 1997). Another very good piece of software for improving general listening skills is *Quick English v2.5* (INS: 1996) which scored high in both the Hiroshima and Kyoto studies mentioned above.

Writing and Grammar

To improve writing ability, possibly the best on-line site for Japanese college students is Hiroshima University's English Writing Help Center, located at <http://flare.media.hiroshima-u.ac.jp/english/writing/movie.html>. It addresses needs at three levels of ability. At the basic level, there are many bilingual explanations and exercises concerning English grammar, how to write good paragraphs, and how to write a one-paragraph opinion essay. A grammar quiz-game has been developed and is thought to be the first of its kind on Internet. There is also an exciting chat page, for exclusive use by Hiroshima University students. At the intermediate level, there are bilingual explanations and activities for students needing to do specific tasks such as writing resumes, business letters, and applying to study abroad. At the advanced level, there is a great deal of assistance concerning how to write research papers and long opinion essays.

Importantly, grammar exercises* at the Hiroshima University English Writing Help Center were created after analyzing the grammatical abilities of Hiroshima University freshmen (Lauer, 2002, 2003). For example, with respect to grammatical articles, it was found that most students did not understand that the article *the* is not normally placed just before an abstract generic noun such as *effort* in the sentence *Effort is a quality that comes from within a person*; on the other hand, freshmen had few problems with grammatical articles in expressions such as *one of the first, such an understandable explanation, turn off the computer, and are among the most important*. To cite another finding, students had many problems correctly handling the word *barely*. If all Internet sites are constructed while studying the weaknesses and strengths of site users, it will make for more effective learning materials.

There are other Internet sites too where students can improve writing skills. The Purdue University Owl Online Writing Lab has comprehensive information about all aspects of writing, though the explanations are only in English. Students who like to write in daily diaries should have a look at the Open Diary site; entries can be kept private or can be opened to the public. The Family Education Network has an easy-to-use site which assists with spelling. Links to these pages are available at <http://home.hiroshima-u.ac.jp/flare/EnglishStudySite2004.html>

Keypals, a one-to-one pen pal relationship with someone via e-mail, is another exciting activity by which students can improve their writing abilities (Fedderhldt, 2001; Liaw, 1998; Ruhe, 1998). For example, in the Fedderhldt study, Japanese college students exchanged e-mails with students at a Danish university. Such exchanges can even be done successfully with lower-level Japanese junior high school students (Pattimore, 1999). E-mail exchanges work best as a class activity when the teacher a) gives each student multiple

*The topics of grammar and general writing are closely linked in this paper because solid research indicates that if a student is good at grammar, then that student is also good at general writing (Pike, 1976).

partners, b) does exchanges with several classes in different countries, c) sets up mailing lists so that students can write to everyone in the other class, and d) gives assignments to interview keypals (Warschauer, 1995). Keypal rewards are real, but careful planning needs to be done in advance in an attempt to keep the number of problems small (Nozawa, 2002). For more suggestions and links, see Kenji and Kathleen Kitao's page at <http://ilc2.doshisha.ac.jp/users/kkitao/online/www/keypal.htm#student>

Local Area Network (LAN) software allows real-time conferencing so that students and teachers can display their essays and exchange ideas with each other in a kind of closed-network, "chat" format. Many studies show that students write a lot during LAN-based classes (for example, see Skinner & Austin, 1999; and Braine, 1997). Some research also indicates that online peer review of student writings has advantages over face-to-face peer review (DiGiovanni & Nagaswami, 2001). For example, students seem to enjoy online peer review more, and teachers can better monitor it because the comments of peers are always typed and available for printout.

Cellphones, owned by over 90% of university students, also offer tremendous potential with respect to e-mail exchanges (as well as to general access to Internet). Research on this is just beginning (Dias, 2003; Thornton & Houser, 2002).

Publishing student writings on homepages has been shown to be very effective in many studies (for a review of the literature, see Kitao (2002)). The socio-cognitive interchanges with peers or teachers which lead to the final published product, and the incentive to make a product which will probably be seen by others, theoretically facilitates the acquisition of new knowledge about English grammatical structures. Miyao (2003) successfully had junior college students make their own Web pages, and also the students wrote creative stories using the software *Study Note* (Koryosha: 2000). Students wishing to make their own homepages in English should go to either the Hiroshima University site at <https://www.riise.hiroshima-u.ac.jp/wot/> or Kitao's page at ilc2.doshisha.ac.jp/users/kkitao/online/www/kitao/int-www.htm#adv

Omnipresent *MS Word* (Microsoft: n.d.) has a very valuable function which allows teachers to correct students' writings. By going to the tools bar and clicking on "tracking", a teacher can recommend changes and embed comments into a student's paper, and then send the paper back to the student for revision.

Software has been shown to be effective in teaching grammar. Nutta (1998) compared college ESL students receiving computer-based grammar instruction with others receiving teacher-directed grammar instruction. The computer-based students used *ELLIS Middle Mastery* (CALI: 1996) and *ELLIS Senior Mastery* (CALI: 1996). This software contains audio, video, recording capability, clear grammar explanations, and practice activities. The target structures were past tense and subjunctive mood (i.e., *conditional If*). The computer-based students scored significantly higher on open-ended tests (example question: *If I didn't have to study to get good grades, _____*) than the teacher-directed students. But there were no significant differences on multiple choice or fill-in-the-blank tests.

The Internet offers many good sites for learning English grammar, including sites at Karin's ESL Partyland, Internet TESL Journal, and BBC World Service. These pages can be accessed at: <http://home.hiroshima-u.ac.jp/flare/EnglishStudySite2004.html>

A new type of software records every keystroke and mouse action that a writer makes in a word processor, along with the time of occurrence. *jEdit* (jEdit: n.d.) has been used in research along with *Trace-it* (Royal Institute of Technology (Stockholm): 1994). Lindgren & Sullivan (2002) found that writers moved their attention from one point in the text to another to do revisions much more often when writing comparative texts (e.g., compare and contrast two student magazines) than when doing descriptive writing (e.g., "My Way to Work"). By using such software, students may be able to understand their strengths and weaknesses (Sullivan & Lindgren, 2002); for example, one student noticed spelling problems, while another student realized that she concentrated too much on certain paragraphs, thus neglecting the overall composition.

Having said all this, however, it is important to note that some findings do question the ability of computers to aid student foreign language writing. A review of the literature indicates that computers per se do not significantly improve the quality of writing without the presence of appropriate writing instruction (Iwai, 1999). Also, some research shows that traditional classrooms are as good as, if not superior to, LAN formats, because in traditional classrooms students can give better feedback on each other's work (Braine & Yorozu, 1998), and because of the simple fact that most students have poor English keyboarding abilities. (For free keyboard training, students should check out Mikatype at <http://www.asahi-net.or.jp/~BG8J-IMMR/>)

But, it is generally agreed that multimedia have the ability to make the learning of writing and grammar more enjoyable. For instance, Leow (1995) states that audio clips accompanying grammar activities are effective because students can notice unexpected sounds (novel inflections) at the ends of familiar verbs. Also, Garza (1996) argues for the value of pictures, animations, or digital video to accompany grammatical text, and for coloring target structures so they stand out from other text.

Reading and Vocabulary

Compared to other language skills such as listening or grammar, it is less clear whether computer tools can improve reading skills. Can skills such as identifying main ideas in a text, or using referents such as "it," be learned well within the confines of a computer screen? Research has just begun in this area.

For example, Underwood (2000) asked large numbers of native English-speaking students to use two very different reading programs. *Success Maker* (Computer Curriculum Corporation: n.d.) requires students to do various reading skills tasks on a computer. *Living Books* (Broderbund: 1998) has students reading from an interactive, "talking novel." Results indicated that students enjoyed both pieces of software and improved their reading abilities using both methods. But superior performance gains compared to traditional

techniques could not be assured.

A great deal of applied linguistics research indicates that learning occurs when attention is focused on meaningful language (Krashen, 1985), so, using Internet, English reading ability can be improved by going to any site that is of interest to students—for example, sites dealing with sports, fashions, karate, or pets. Lovers of science should definitely peruse the New York Times Science Q & A site at <http://www.nytimes.com/learning/students/scienceqa/index.html> Also, there are many classic books and stories available free on line at: <http://digital.library.upenn.edu/books/> For research, an online encyclopedia is available at <http://encarta.msn.com/> and an online dictionary is available at <http://encarta.msn.com/>

A site which offers good reading language-learning support activities is Karin's ESL Partyland, located at <http://www.eslpartyland.com/quiz%20center/quiz.htm#Reading>

High-quality software includes *Reading Skill Trainer* (Eichosha: 2001). There are 153 stories at three levels of difficulty, and students can answer comprehension questions either after reading a paragraph or after reading the whole text. *ASK Training CDs* (ASK: 1999) are also very good; students can improve speed-reading skills while reading about science, business, or other interesting topics.

An important potential of computers with respect to reading is that programs will soon be able to track data and produce a "comprehension processing log" —a reconstructed roadmap showing why and how certain glosses were consulted, and where comprehension difficulties occurred (Liontas, 2001).

Vocabulary ability is a key component of reading ability, and Internet features many good sites for improving this aspect of language. For example, numerous fun quizzes and crossword puzzles are available at the Internet TESL Journal site. Idioms and slang can be learned by looking at the Dave Sperling ESL pages. The 1,000 most frequently-used words are listed at Kenneth Beare's English as a 2nd Language page. All of these sites can be found by going to: <http://home.hiroshima-u.ac.jp/flare/EnglishStudySite2004.html>

An amazing site for translating English text into Japanese vocabulary is located at: <http://www.rikai.com/perl/HomePage.pl?Language=Ja> Here, for no fee, students can download their favorite texts from the Internet, and click onto any word to find its meaning.

Indeed, the best multimedia materials for students in Japan have Japanese support. Grace (1998) found that low-level second language learners using computers, regardless of their personality types, learn new words significantly better when first-language translations are provided.

Electronic bilingual dictionaries have made learning English much more pleasant than it used to be. In a flash, students can look up the definition of any word and find good example sentences. Loucky (2002), in a study involving students from several Japanese universities, found that electronic bilingual dictionaries "help stimulate vocabulary learning" and "help all students process new expressions very rapidly and effectively (p. 132)."

Annotations (e.g., definitions, translations, grammatical notes) help students avoid

wasting time looking up words in a dictionary. Some studies have also shown that glosses or annotations of unfamiliar expressions are more easily remembered when those annotations include pictures as well as text (Yoshii, 2003; Kost et al., 1999). In any case, compared to print media, the glossing capability of computers is a very helpful feature (Jarrell, 2003; Lomicka, 1998).

Tanaka & Lauer (2003) have developed a multiple-choice test to evaluate the vocabulary size of Japanese learners of English. It is available to everyone at <http://flare.media.hiroshima-u.ac.jp/english/>. Also, at the same site can be found another test which evaluates the vocabulary abilities of Japanese university students in real-life communicative situations; the rationale for this latter test is explained in Tanaka (2001).

Electronic text corpora provide another exciting multimedia tool for learning English vocabulary (Donley & Reppen, 2001; Cobb, 1997). These are lists of words accompanied by usage examples which have appeared in both written and spoken discourse. Teachers and high-level students can make use of data such as the frequency with which particular vocabulary items occur, and in which registers they occur. For example, the British National Corpus is a 100 million-word corpus of British English available on Internet for a fee. *MonoConc Pro Version 2.0* (Athelstan: 1999) is a concordancing program which has been used successfully in class (Rilling & Pazvant, 2002).

Some more vocabulary-related software is mentioned in the following section.

Speaking

The first step toward "talking with a computer" is to have the computer understand what the student says. Speech recognition (SR) software can do this—to some extent—today.

A major technological problem is that SR programs have to accept nonstandard accents and dialects, and have to answer the difficult question: What is acceptable English? Today, SR software routinely assumes the goal is errorless recognition. It attempts to make collocation interpretations; it tries to guess what the speaker intends. Thus, if someone says "Peter was an angly man," the program has been found to interpret it as "Peter was an angry man" because the expression "angry man" appears with much greater frequency in natural language (Coniam, 1998).

SR systems, in general, yield higher accuracy when the number of students' permissible utterances is low. So, most current SR software limit the student to a small set of multiple choice responses. This can involve lexical items or dialog utterances. From a theoretical standpoint, such task-based activities are effective approaches to language learning (Nunan, 1995).

For example, in *TriplePlayPlus* (Syracuse Language Systems: 1997) there are comic strips with bubble dialogs. The student has to fill in the dialog bubbles by saying one of several alternatives which are provided. The software sometimes makes mistakes, but this format has some value.

New Dynamic English (DynEd: 2001) also engages the user in a constrained conversation. The student hears an utterance and then sees several reply options on the screen. If the student gives the correct answer, the conversation continues to the next exchange.

TraciTalk (Courseware Publishing International: 2002) is a similar piece of software which has value in teaching oral fluency. Students give oral commands to "Intelligent Agent Tracy," whose video image appears on the screen. These activities are fun and communicative, though Tracy seems a bit hearing-impaired (students sometimes have to repeat commands).

Today SR technology canNOT diagnose specific pronunciation problems, but there is some remarkable pronunciation training software on the market. By using a sound editor and a time-amplitude display, students receive not only audio pronunciation training but also visual support (Berberich, 2003).

One of the best software for Japanese who want to learn English pronunciation might be *Accent Coach English Pronunciation Trainer* (Syracuse Language Systems: 1999). Developed specifically for Japanese learners of English, the software focuses on pairs of contrasting English sounds and intonation that often cause problems. There are various levels of difficulty, and the student's sex is accounted for. A user can record his or her own voice and compare it to that of a native pronouncing words and sentences. An "Interactive Vowel Chart" responds to users' spoken vowels by highlighting visual targets. There is an "Intonation Display" where the users' intonation can be graphically compared to that of a native English speaker. A "Speaking Challenge Video" allows for self-assessment. Summarizes Taylor (2000). "It is easy and fun to use and very reliable."

Another piece of software which has been praised (Norris-Holt, 2002) is *Pronunciation Power One* (English Computerized Learning: 2000). It is in English, but comes with Japanese instructions. *TraciTalk*, mentioned above, gives students relatively accurate minimal-pairs practice (e.g., "I want a beet" vs. "I want a bit").

On the Internet, a very good site for students to do conversation-like chat while typing on a keyboard is Dave's ESL Chat Central, located at <http://www.eslcafe.com/chat/chatpro.cgi>. There, students can engage in live communication with other students from around the world; strong evidence indicates that social interaction with peers results in the acquisition of new knowledge (Vygotsky, 1978). Peterson (2003) also argues for the use of such chat sites.

For teachers in Japan wishing to do keyboard-based chat as part of lessons, a very good site is Kanto Gakuin University's LECS (Language Educational Chat System), located at <http://home.kanto-gakuin.ac.jp/~taoka/lecs/>. Here, classmates chat in private rooms, the program gives some linguistic feedback concerning their utterances (such as average length of sentence and spelling mistakes), and teachers can print out finished chat transcripts for further evaluation.

The BBC World Service "Welcome to London" component includes interesting pronunciation exercises, accessible at: <http://www.bbc.co.uk/worldservice/learningenglish/>

multimedia/london/index.shtml Useful expressions for travel survival are listed at: <http://www.manythings.org/ts/j>

PhonePass is an on-line examination of speaking skills, marketed in Japan by Thomson Learning. The system has been shown to have high reliability rates (Townshend et al., 1998). For about ¥5,000 per test, students phone to a computer, take the short test, and then the results are available on Internet a few minutes later. The degree of correlation between a subject's responses and native speakers' model wave patterns determines each student's score. Scores are given by the computer for pronunciation, fluency, vocabulary, and more. Beginning in 2005, the revamped Test of English as a Foreign Language (TOEFL) will have a speaking component which utilizes this technology.

In oral presentation courses, students can use *Power Point* (Microsoft: n.d.) software in conjunction with Internet research to produce interesting presentations (Johnson, 2002). Also, *SpeakEasy* is a very good Internet site which offers lots of advice and video clips concerning oral presentations. It is located at <http://ecourse.hku.hk:8900/webct/ticket/WebCTLogin> (Users should use the login name: *xoral_guest*, and the password: *guest*.)

For regular English conversation classes, teachers should check out <http://iteslj.org/questions/> Here is a list of over 2,000 questions on 33 topics.

The Current Situation at Hiroshima University

Murakami & Szirmai (2002) report that each semester at Hiroshima University about 15 English language semester-long courses are held in which the teachers directly utilize the CALL facilities. Indeed, the number of teachers who use more than Internet or standard video and audio tapes is very limited.

WebCT is a powerful tool available to all Hiroshima University instructors. This LAN allows for easy teacher-student and student-student communication, plus students can get round-the-clock information about the content of their courses. These materials can include text, photos, slides, videos, glossaries of terms that are hyperlinked, class schedules and more. Students can do quizzes on line and get information about their grades in the course. For details, see Thornton (2003) or the university site at: <http://www.media.hiroshima-u.ac.jp/> Unfortunately, it seems like very few English instructors are using WebCT at present.

Recently, Hiroshima University has spent a lot of money, so today it has some state-of-the-art equipment and software. The most interesting multi-media center on campus is located on the third floor of the West Library. This independent-study room has 120 computers, 16 private booths, and scores of DVDs, videos, and English language-learning software.

The two newest computer rooms on campus are J209 and J307, opening in April 2004. In those rooms, for example, students can make their own digital recordings, and any part of the recordings can be accessed and analyzed immediately. Captions can appear together with the utterances. Teachers can see and write things on the students'

screens. Students can get immediate results to multiple-choice tests. For more information on this next-generation of computers, see Szirmai & Murakami (2003).

Yet, there are problems, too. For instance, at present computers play a very small role in the English language curriculum. As Jones (2001) states, most students are incapable of moving instantly into self-access CALL; they need training and teacher guidance. Thus, the curriculum should be revised so that there are more English education courses which involve computers.

Conclusions

Thanks to the world of computers, exciting tools exist by which Japanese can improve their English abilities. CALL, in contrast to traditional classrooms, may be especially beneficial for shy students (Shimoyama et. al, 2002).

Of course, multimedia also have limitations. For example, computers are not very good at mimicking human thought processes or making creative decisions. At present, they cannot produce personalized, spontaneous conversations, so they may not be very good at improving speaking skills. Computers often frustrate students. Computers are expensive.

A key question remains: Is CALL worth the tremendous amount of money it costs? The answer is inevitably "yes", but amazingly, influential applied linguistics journals such as *Language Learning* and *TESOL Quarterly* have published very little on the effects of CALL. An important mission which language teachers will undertake in the years to come will be measuring the benefits of various CALL-related tasks.

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要 約

コンピュータを利用した日本における英語教育の改善

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本稿は、日本における大学生の英語学習者にとって、コンピュータを利用することが英語学習に役立つ方法を紹介する、実践的なものである。リスニング、リーディング、語彙、ライティング、文法、そしてスピーキングという技能の英語学習について、CALLの現状が記述される。また、良質の英語学習用ウェブサイトやソフトウェアが紹介される。そして、広島大学におけるマルチメディア環境について、簡潔に説明される。