The Best Computer Software
for Learning English in Japan

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Introduction

What constitutes effective English education software in Japan?   The author reviews the literature, and identifies factors which are usually associated with high-quality computer software.   For example, software should have Japanese vocabulary and grammatical explanations.   Good software provides accurate feedback to students.

Computer software is found to be effective with respect to improving English listening, vocabulary, speaking, grammar, and writing skills.   The current capabilities of speech recognition software are explained.   The author cites software which has been highly praised in Japan.

General Characteristics of Good Software

Computer software is a powerful second language acquisition tool.   It can provide multiple layers of data simultaneously; text, graphics, animations, sound, and video are all very motivating to students.   Software is good at storing linguistic data and providing links to various data.   It provides untiring accuracy.   Knowledge is mapped into learners' minds using repeated practice.   Software provides privacy and flexibility in time and space. Students have control.   Software can be designed to accommodate different learning-style preferences.   Computer software opens the world of illusions, games, and simulations.

But computer software also has limitations.   It is not very good at mimicking human thought processes or making creative decisions.   At present, it cannot produce personalized, spontaneous conversations, so it may not be very good at improving speaking skills. Software often frustrates learners.   Software is expensive.

What does good English-learning software look like? Second language acquisition researchers have recently delineated a number of models (Thorn, 1995; Watts, 1997; Healey and Johnson, 1997; Tergan, 1997; Soo, 1998; Murray and Barnes, 1998; Bader, 2000).   Those findings are summarized in the form of 14 questions by this researcher here.   (This list is not meant to be comprehensive, and it is acknowledged that some categories overlap.   But it is a good starting point.)

1) Does the software meet the linguistic (and, to a lesser extent, social) needs of our students?
2) Does the software give Japanese support to lower-level (i.e., most) students?
3) Is the software user-friendly, including clear instructions?
4) Is it at an appropriate level of difficulty?
5) Does it have a wide range of pedagogically-sound tasks?

6) How is new language introduced?

7) Does it have interesting computer graphics such as animation, enlargement, overlapping, and superimposing?

8) Does it move at a good pace?

9) Does it allow users the ability to begin the program at different points?

10) Does it have carefully-chosen video sequences to provide the sights and sounds of places where English is spoken?

11) Does it include authentic documents from sources such as magazines and advertisements?

12) What kind of output comes from learners?

13) What form of learner assessment, feedback, or progress-charting is provided?

14) Is it worth the money?

A few points of clarification need to be made. First, regarding Question 2, it is becoming clear that the best English software for most Japanese students includes vocabulary and grammar explanations written in Japanese. Many high-quality studies have found that bilingual materials are better than monolingual ones (Scherfer, 1993; Knight, 1994; Hulstijin etal., 1996; Laufer & Hadar, 1997; Watanabe, 1997; Laufer and Kimmel, 1997; Lomika, 1998). In a major study carried out in Japan, Luppescu and Day (1993) found that bilingual dictionary-use was a great aid to students. In the area of Computer Assisted Language Learning (CALL), Grace (1998) found that low-level second language learners, regardless of their personality types, learn new words significantly better when first-language translations are provided. Lauer (this issue) found that bilingual software is more popular than monolingual software. The collective results of these studies provide a major blow against English-only software.

Regarding Question 3, software should have clear, brief instructions. It should have consistency between screens (icons located in similar places, etc.)

With respect to Question 8, Soo (1998) says that giving students an appropriate amount of time to do tasks in a software program promotes better student attitudes and reduces stress. Students need time to integrate new information. But, if students have too much freedom, they may get too absorbed in details, so miss the big picture, and achievement scores are not necessarily higher. In addition, stress is sometimes fun. (Games such as *The Oregon Trail* (MECC) are interesting because students have to reach goals within a certain amount of time.) Moving at a proper pace is an important software design issue.

As for Question 13, error correction is a key function which software must possess, because English learners can benefit from explicit error correction under at least some circumstances (see Lyster & Ranta, 1997, for a review). Software can quickly link students to exercises designed to correct errors. Feedback on task success can be instantaneous. The ability of computers to deliver immediate feedback has been shown to have beneficial effects on learning English in Japan (Nagata, 1993). Brandl (1995) also shows that computer software can give helpful learner error feedback. Soo (1998) reports that a lot of students enjoy cumulative score charts as they move through software programs. Students are provided with attainable goals. Students can chart their own progress and assess themselves,

and, if desired, they can compete with other students.

Improving Listening, Reading, and General Vocabulary Skills

English listening abilities can almost certainly be improved with the use of CD-ROMs. For years, video has been shown to be an effective learning tool (see Rubin, 1994, for a review of the literature). On a computer screen, video images can be juxtaposed with meaning-focused tasks to be completed while listening. One type of listening comprehension exercise on CD-ROM has students listening to words or sentences or questions, and then clicking on the corresponding part of a text. Other software listening exercises utilize dictation, fill-in-the-blank, multiple choice, and picture-matching activities.

Brett (1997) found that advanced ESL students 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. This study is a bit remote from the situation in Japan — for example, the students were mostly motivated continental Europeans with good computer skills — but it does indicate the power of computers.

With respect to reading, the effectiveness of CD-ROM compared to traditional learning tools is less clear. Can reading skills such as identifying main ideas in a text, or using referents such as "it," be learned well in the confines of a computer screen? The answer is not yet known. In any case, there is an amazing scarcity of software on the market which is specifically aimed at improving English reading skills.

Research into the effectiveness of reading software has just begun. For example, Underwood (2000) asked large numbers of native English-speaking students to use two very different reading programs. *Success Maker* (Computer Curriculum Corporation) requires students to do various reading skills tasks on a computer. *Living Books* (Broderbund) has students reading from an interactive, "talking novel." Results indicate that students enjoyed both pieces of software and improved their reading abilities using both methods. But interpreting results is complex, and superior performance gains compared to traditional techniques cannot be assured.

It would be ideal if students could import ANY electronic text into a computer, and a software program would teach that text, using, for example, automatic links to vocabulary explanations. Cummins (1998a, 1998b) and other researchers are trying to design such a program. Cummins' program is called the e-Lective Language Learning CD-ROM. Beginning later this year (personal communication) users will be able to download their favorite texts from the Internet, and click onto any word to find its meaning, pronunciation, and grammatical usage. Furthermore, any word which is checked by the student could automatically be available later in a test for reinforcement. This could be very motivating, indeed.

Knowledge of vocabulary is what separates advanced English users from intermediate

ones, and software clearly can help students improve their vocabulary skills. Definitions can be either glossed on the same screen or accessed in seconds by a page link. Some vocabulary-acquisition software is mentioned below.

Improving Speaking Skills

Eskenazi (1999), in summing up the literature, tells us that to become good speakers, the following factors must be present: 1) Learners hear large quantities of speech. 2) Learners hear many different native speakers. 3) Learners produce large quantities of utterances on their own. 4) The context in which the language is practiced has significance. 5) Learners feel at ease. 6) Learners receive pertinent feedback. 7) There is ongoing assessment. The good news is that computers can help students do most of these! Only point 6 — good feedback on student utterances — is a major problem now.

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. There are several types of SR software on the market.

Dragon NaturallySpeaking (Dragon Systems), for example, according to advertisements, can accurately transcribe 90% or more of the vocabulary which a native English speaker utters in continuous speech; the speaker does not need to pause between words. In English education in Japan, this could potentially be used on a read-aloud test, which is one indication of overall English ability. If the computer can understand the speaker, he or she is doing something correctly.

However, Coniam (1998, 1999) and Derwing et al. (2000) report that this 90% accuracy level is virtually impossible to reach when even excellent non-native English speakers use the software. Derwing et al. found a vocabulary accuracy rate of only 72% when Cantonese and Spanish-accented speakers (with otherwise advanced English skills) used it. The software misinterpreted a few key words in each sentence, making most sentences unintelligible. In other words, native speakers could easily understand the speakers, but the software could not.

A major technological problem is that SR programs have to accept nonstandard accents and dialects, and have to answer the often fuzzy 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.

TriplePlayPlus (Syracuse Language Systems) is an example of SR software which has the potential to improve second language vocabulary ability. It is based on an older technology

in that pauses must be placed between words. It teaches Spanish, and uses vocabulary games such as hangman, crossword puzzle, and bingo. But Wachowicz and Scott (1999) found that it often falsely accepts incorrect spoken input and falsely rejects correct spoken input. For example, it accepted "no grass here" for "gracias" (thank you) and "my niece" for "mais" (corn).

Vocabulary Builder (Hyperglot, the Learning Company) is another example of this second type of SR software. It is a word-list memorization activity. Students match 2,000 words with corresponding pictures. When a picture appears, students say the correct word. But this memorization activity is possibly boring and ineffective. Also, no synonyms are allowed. A nice part of the program is that vocabulary items are thematically grouped (for example, words pertaining to a family photo).

Several SR software try to improve English oral fluency. In *TriplePlayPlus* 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.

Dynamic English International (DynEd) has words in a mixed-up order, and the student has to say them in the correct order. It is relatively fun and reflects sound pedagogy. But Wachowicz and Scott (1999) found that this, too, sometimes falsely accepts incorrect spoken input and falsely rejects correct spoken input.

TraciTalk and *See it, Hear it, Say it!* (both developed by Courseware Publishing International) also have value in teaching oral fluency. They utilize IBM's VoiceType Application Factory, which uses a continuous recognition engine developed at Carnegie Mellon University. The software does both conversational practice and pronunciation practice. There are two types of conversational exchanges: 1) Students speak with an animated character whose lips move. The learner chooses a line of dialog among several alternatives. The story branches according to which lines the student utters. 2) 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). From a theoretical standpoint, such task-based activities are effective approaches to language learning (Nunan, 1995).

Today, SR technology canNOT diagnose specific pronunciation problems, but there is some remarkable pronunciation training software on the market. *TraciTalk* and *See it, Hear it, Say it!* both give students relatively accurate minimal-pairs practice (eg.,"I want a beet" vs. "I want a bit"). *Vocabulary Builder* includes pronunciation scoring as a part of vocabulary games and conversational practice. A learner's pronunciation is evaluated on a three-level scale, from "tourist" to "native speaker." The accuracy of this scale has not yet been tested, but preliminary indications are that it is not so precise (Wachowicz and Scott, 1999).

Auralang (Auralog) is software that gives word boundary practice. This is a vital skill because it is one of the greatest difficulties in listening comprehension. A student listens and imitates. The student's voice is graphed in the form of a sound wave and compared it to that

of a model native speaker. But it is not yet clear whether learners can benefit much from seeing acoustic features.

One of the best software for Japanese who want to learn English pronunciation might be *Accent Coach English Pronunciation Trainer* (Syracuse Language Systems). 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. It uses IBM ViaVoice technology for continuous SR. A user can record his or her own voice and compare it to that of a native speaker. Students receive prompt, helpful feedback in Japanese. A video image has a model 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 speech evaluation software program is *PhonePass*, which has been shown to have high reliability rates (Townshend et al., 1998). The software includes a database of native and non-native spectrographic wave patterns for a pre-established series of questions. The degree of correlation between a subject's responses and the model wave patterns determines that student's score.

In summary, SR software has the following characteristics (Wachowicz and Scott, 1999): 1) A learner can use full-sentence utterances. 2) What a learner says is limited to a small number of options. 3) A significant proportion of student utterances are misunderstood. Yet, this are not so bad; after all, the audio-lingual method sounds much like this, and that method is somewhat effective. As Wachowicz and Scott (1999) phrase it, "CALL's strength is in exercising routine aspects of production skills" (p.265).

Improving Grammar, Writing, and Specialized-Vocabulary Skills

With respect to grammar education, Leow (1995) claims that audio input is highly effective because learners tend to notice unexpected sounds (novel inflections) at the end of familiar verbs. Garza (1996) argues for the value of pictures, animations, or digital video to accompany grammatical text, and for colorizing target structures so they stand out from other text. Collentine (1998) recommends using materials created with Macromedia's Director Studio to match sentences with pictures. Nagata (1998) claims that "computer-assisted language instruction... holds out the promise of unlimited, immediate feedback pinpointed to the specific grammatical errors made by the student" (p.23).

Yoshii and Milne (1998) have developed a software program which they claim helps Japanese students master the English articles, "a" and "the." Called *DaRT*, it utilizes diagrams and communicative contexts. There are numerous exercise sentences. If a student answers incorrectly, a hint is given and the student has at least one more chance. When one exercise is finished, the following exercise is determined by performance on that previous exercise.

The system does not have a fixed set of preestablished sentences; it creates new sentences by recombining words in its dictionary. The software is not on the market today (personal communication), but it is described in such detail in the published article that it can be relatively-easily recreated by a teacher.

Concerning writing, the benefits of word processing software have been well documented (Pennington and Brock, 1992). *Markin 32* is one of the top shareware programs which help teachers correct students' writings (Burston, 1998). At the very basic level, every multimedia center should have software which teaches students how to use an English computer keyboard; *Mario Teaches Typing* (MacPlay) is one software package which is used in Japan (Johnson and Brine, 1999).

With respect to content-based English instruction — for example, teaching science English or law English — CD-ROMs have been shown to be of benefit. In one study, for instance, Brett (2000) integrated two business English software into the self-study curriculum of undergraduate second language learners in Britain. Students reported that the CD-ROMs were enjoyable and helped the students score well on course tests.

Software Which Has Received Praise in Japan

Researchers in Japan are evaluating software. A helpful Japanese magazine for English software reviews is *Cornucopia*, published by Kirihara Uni. Also in Japanese, Mediaworks publishes quality evaluations of software, located at http: //www.mediaworks.co.jp/alt/012/index. html In English, check out the *TESOL CALL Interest Section Software List*, available at http: //www.orst.edu/dept/eli/softlist/

At Hiroshima University, Lauer (this issue) reports on software which students praise. The most popular conversation/listening software were found to be: *Listen!* (Heinemann), *The Rosetta Stone* (Fairfield Language Technologies), and *Quick English* (INS/ アイ・エヌ・エス). Students' favorite test preparation materials were all produced by ALC (アルク): TOEIC 実践模擬テスト, CD-ROM 版 TOEIC テスト　スーパー模試600問, and TOEIC (R)` テストパーフェクト730点. The most popular business software was *Dynamic Business English* (DynEd). The favorite story-telling software were all originally produced by Softrade: *Murder She Wrote, Beverly 90210,* and *Columbo.* The top-rated nonfiction software was *Talking About Japan in English* (NEC Interchannel and NHK Service Center).

At Kyoto University's Faculty of Integrated Human Studies, four staff members of the Multi-Media Committee (2000) evaluated computer software located in that facility. The top -ranked conversation/listening software were *Quick English V 2.5* (INS), *Dynamic English* (DynEd), and *Practical English Series: Small Talk 1, 2, 3* (Infinisys). In the area of test preparation materials, *TOEIC Super Training 470, 730* (ASCII) received very high marks.

Comparing these two studies, it is interesting to note that *Quick English V 2.5* did well in both studies. The software *Columbo, Murder She Wrote,* and *Beverly 90210* were very popular among students, but only received average scores from the administrators. *Dynamic English* scored rather low among students, but high among the administrators. *Rosetta Stone* was

praised by students, but received quite low marks by the administrators.

Conclusion

In the end, the best software for our students will be that which is designed to meet the needs and desires of Japanese students. And, this "best software" will most likely be designed by teachers. Hemard (1997) shows how people who are not computer specialists can design hypermedia language learning applications. Frommer and Foelsche (1999) describe a major new authoring system, called *SuperMacLang* (Harvard Univeristy). It has just come onto the market.

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要　約

日本における英語学習に最も適したコンピュータ教材

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　効果的な英語学習用コンピュータ・ソフトの特徴とは何であろうか。筆者は，第二言語習得の分野での最近の諸文献を検討し，質の高いとされるソフトの特色を明らかにしている。たとえば，語彙や文法に関する日本語の説明がなければならないこと，学生に対して正確なフィードバックを提供できるのが良いソフトであるということなどである。
　英語学習用ソフトはリスニング，語彙，スピーキング，文法およびライティングの能力を向上させるのにかなり効果的であることが明らかにされ，音声認識ソフトの現時点での性能についても触れられている。筆者は，また日本で高く評価されているソフトの具体例もあげている。