

Using CALL to Bridge the Vocabulary Gap

Chikako Nishigaki & Kiyomi Chujo

Each group of language learners has particular idiosyncratic characteristics, and we are all well versed in the challenges that face Japanese learners of English: acquisition is humbled by a language “distant” from English (alien alphabet, pronunciation and structure), motivation is undermined by the ability to live blissfully without using English, and of course, students are culturally programmed to avoid blundering through communication. The good news is that technology brings solutions.

We language educators also know that vocabulary building is at the heart of language acquisition, and that if we can find a way to help learners improve vocabulary outside of the classroom, then classroom time can be used for teacher-student and student-student interaction. We have developed university-level vocabulary CALL programs for TOEFL and TOEIC and are in the process of developing additional e-learning material for everyday vocabulary to be used at the elementary and junior high school levels in Japan.

<1> The Epiphany

TOEFL tests generally measure a learner’s grasp of general academic English while TOEIC includes business English. We looked at the vocabulary found in the most popular series of Japanese junior and senior high school (JSH) textbooks and wondered how much TOEFL and TOEIC vocabulary was actually taught, and what specific words were missing. The current thinking in the field of vocabulary teaching and learning is that someone reading a text should be able to understand 95% of the vocabulary in order to understand what was being read. Using this concept (called “coverage”), we compared the JSH textbook vocabulary with TOEFL and TOEIC vocabulary and not surprisingly, there was a huge gap (see Chujo and Nishigaki, 2003). We expect students to be able to score well on TOEFL and/or TOEIC tests after graduating from college, but we do not teach them the vocabulary they need. This gave us an idea: create an out-of-class CALL

program to teach the missing vocabulary, and do it in a way to integrate theories of learning, information processing, second language acquisition and TESL to ensure long-term retention. And most importantly, we wanted to make it fun.

<2> Building a CALL Program

To create the CALL material, first we listed all the words (145,391) from twenty TOEFL practice tests, and saw that these were 6,839 different words. (For example, *communicate*, *communicates*, *communicating*, and *communicated* are forms of the same word and were listed under a base word, *communicate*, with a frequency of four occurrences.) Next we subtracted all the words we knew would be taught in junior and senior high school by comparing the list to the JSH vocabulary list. That gave us 4,848 TOEFL words that would be new to high school graduates. Nation (2001) tells us that an effective word list should provide a reasonable ‘frequency’ of occurrence of words and encompass a wide ‘range’ of texts, so next we listed these 4,848 words in order of frequency and any word that appeared fewer than four times was excluded. From the resulting 1,412 remaining high frequency words, we then deleted any word that had a small range, i.e. words that appeared in only one or two of the TOEFL tests, which left us with 1,023 words. We also noted that 322 of these words appear in college EFL learning material and would be taught at the college/university level, so these were eliminated as well, leaving 701 words as the “missing”, or core, vocabulary for the CALL program. The TOEIC core vocabulary was created in a similar way.

Once we had the vocabulary, we had to create an effective delivery that would work best for learners and support classroom teaching, and we decided on ‘spaced learning’. The figure below shows how the first ten vocabulary words are learned in isolation, then are learned in phrases, and then in sentences. As the learner progresses through stages, new units of ten words are added as the previous units of words are reviewed in different lessons on different days. There is an ‘introduction step’ to get the student to think about what words might mean and to listen to the words in a series to prepare for learning. Next is a ‘learning step’ that allows the student to press a button to hear the pronunciation and to hear the words in a different order. A ‘confirmation step’ quizzes the student on comprehension, for example, answering a target word with a definition from a monolingual dictionary. A ‘review step’ prompts students to double-

check their understanding of the target words. Finally, prefixes and suffixes are also given to expand the students' knowledge base of the words. Twenty units of ten words covers 200 words for each program, and there are three programs for both TOEFL and TOEIC.

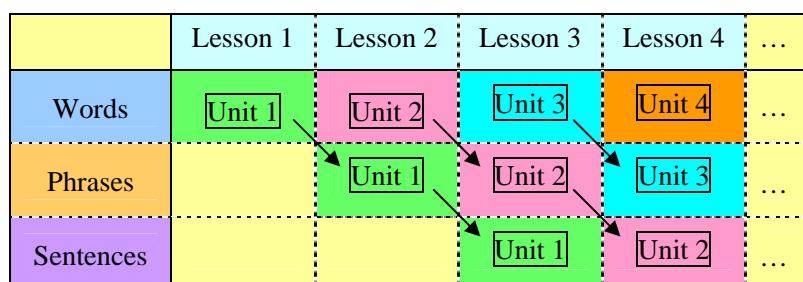


Figure 1 Spaced Learning Framework

The CALL program is visual; it has an audio component; it is kinetic: students interact and physically control the pace of their learning. There is also a feedback/ "hint" feature to allow students to try again and correct mistakes. The program was created using the IBM Homepage Builder (Version 7) software, and can be adapted for CD-ROM or e-learning. Most importantly, the software is not difficult to use, so teachers can create their own programs using core vocabulary specific to their learners' needs (Nishigaki et al., 2004a).

Of course the real beauty of technology is in how we can bring learning out of the classroom or language lab and into real-life situations. To make this program easily accessible to students, we created two types of supplemental material: a book-plus-MD based format, and a cellular phone format. Since MDs and cellular phones are now in nearly everyone's pocket, we wanted to take advantage of these to allow students to access target words while on the go (Nishigaki, et al., 2004b).

<3> Evaluation

Figure 2 here shows how much TOEFL vocabulary is learned at each stage of study from junior and senior high school through the college sophomore year, and compares the coverage with the use of our specialized vocabulary list.

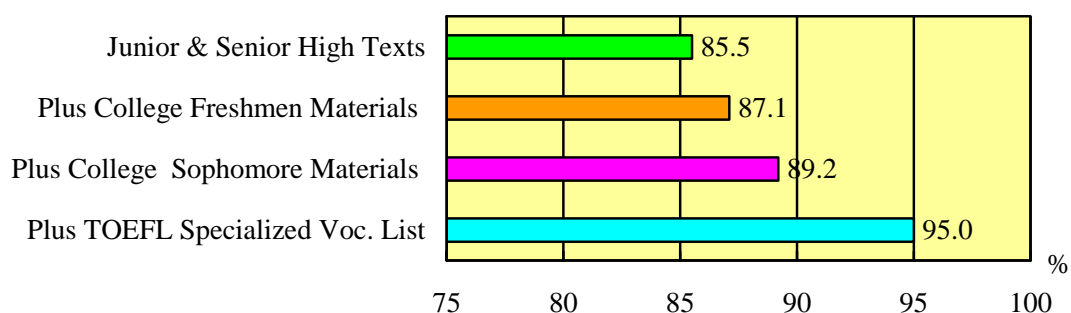


Figure 2 TOEFL Coverage at Various Learning Stages

We evaluated the program by asking university students to use it, and then giving them retention tests and questionnaires. An impressive ninety-five percent of the words learned with this CALL material were remembered four months after the original instruction, including a two-month vacation. A questionnaire with a five-point scale also showed highly positive impressions, for example, students said “the material was useful” (4.4), that “I want to learn more vocabulary with this material” (4.7), and that “the software was easy to use” (4.9).

<4> Elementary and Junior High School Material

Based on the success of the TOEFL and TOEIC programs, we have turned our attention to creating similar material for the elementary and junior high school levels. We know that textbooks used in Japanese junior and senior high schools lack sufficient daily-life vocabulary (Chujo, Hasegawa, and Takefuta, 1994), and it makes sense (an idea supported by theoretical and empirical research) that teaching everyday words to elementary-aged children can be highly beneficial for EFL learners. When the Japanese government began an initiative in 2002 to teach English at the elementary level, we saw this is a wonderful opportunity to teach a core of daily life vocabulary that is currently missing in junior and senior texts.

To create the core vocabulary, we collected words from twenty picture dictionaries published abroad, and ten picture dictionaries published in Japan. We felt it was important to consider Japanese dictionaries in order to include daily words common in Japan but not necessarily common elsewhere, e.g. *chopsticks*, *squid*, *teacup*,

persimmon, and *leapfrog*. From these thirty texts, we gleaned a total of 5,259 words relevant to students' every day lives.

To make sense of such a large number of words, we rated them in various ways. Going back to Nation's (2001) comments about frequency and range, we applied both criteria to this bulky list of 5,259 words. First we gave them a "range" rating which tells us how many picture dictionaries contain that word. For example, a "range 20" word would have appeared in twenty picture dictionaries. Next we checked for frequency by comparing how often the words appeared in both a children's corpus of spoken data (Child Language Data Exchange System) and an adults' corpus of spoken data (British National Corpus). This gave us a statistical score (log likelihood) for "outstanding-ness", i.e. how often or outstandingly the word appeared in the children's spoken corpus. Then we assigned a grade level to each word so we could focus just on elementary level vocabulary. We used Dale and O'Rourke's (1981) and Harris and Jacobson's (1972) criteria for determining the grade at which an American student would learn each word. We now have a core of the most "outstanding" 500 words (Chujo, Nishigaki and Iwadate, 2005) and are currently creating e-learning material based on presenting words in categories (at home, at school, at the zoo, at the park, etc.).

<5> Technology and Communication

We are believers that technology will make our attempts to learn to communicate easier, faster and better. Students who learn incidentally by watching television or listening to English song lyrics now can tune in just about any where and any time. Students who learn intentionally now have a huge variety of tools that make the days of the cassette recorder seem quaint. As educators we can turn the advantages of technology to moving learning out of the class and into every day lives.

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Chikako Nishigaki is an associate professor of TESL at Chiba University and Kiyomi Chujo is an associate professor of corpus linguistics at Nihon University, in Japan. The vocabulary lists mentioned in this article are available at their web pages. <http://www.e.chiba-u.jp/%7Egaki/> and <http://www5d.biglobe.ne.jp/~chujo/eng/index.html>.