A Call for CALL:
Computer-Assisted Language Learning

Dale Ann Sato

I. PROLIFERATION OF COMPUTERS IN EDUCATION:
Are we ready?

CALL is an acronym for Computer-Assisted Language Learning. Most react to the word COMPUTER and forget language learning. Understandably in the past, computer use was reserved for those in post-graduate and specialized research studies, not for ordinary students or subjects. And in business circles, computers were for the accountants and those who handled the extensive number-crunching of industry. So the image of computer use has been long seen only as a tool for the technologically elite and for research purposes. Unfortunately that association still persists. Now in the 90's and beyond, all developed countries suddenly face a highly technological information-competitive world where cost-effective computers can now be an ordinary tool for the general public.

Disdain, fear and avoidance are common reactions to the unfamiliar and fear of computers is no exception. In fact, "technophobia" is a coined expression to describe such reactions. Rosen & Wein define technophobia as: "(a) anxiety about current or future interactions with computers or computer-related technology, (b) negative global attitudes about computers, their their operation or their societal impact." and a more psychologically-oriented definition as "(c) specific negative conditions or self critical internal dialogues during actual computer interaction or when contemplating future computer interaction." (Rosen & Wein, 1995a)

In Rosen and Weil's 1995b international survey of 3,392 first year college students from ten countries, Japanese (438 students from three universities) rated high on technophobic tendencies, especially learning how to use a computer, applying for a job related to computer training and buying a computer. However, anxiety factors were loaded less with technical aspects (such as reacting to data erasures and error messages), which were found in the U.S. sample, but more with global anxieties of computer use because future jobs might require computer training. Results also coincided with German students' responses which Rosen and Well hypothesize are linked to quickly developed countries where a "tsunami" of computerization has caught educational institutions unprepared.

Certainly a great part of technophobia in Japan can be attributed to a lack of exposure and support. Anxieties of Japanese students are genuine. because there is very little in Japanese university curriculums that prepare them for such a high tech world when they graduate. As for Japanese secondary and university teachers, "Introduction to Computers in Education" courses are rare in teacher preparation courses. Word processing by computer is left up to individuals to learn on their own.

In the 1994 Hokusei EMMI project (See Appendix), all the students had no or very little experience using computers nor had they ever visited the campus Computer Center. Although a certain hesitancy could be observed initially, EMMI students overcame their fears with staff support and learned to enjoy their CD-ROM programs

American students have had a great advantage over Japanese students in terms of early computer experience and accessibility in public education. From the mid-1980's, 82% of all American elementary schools and 93% of all secondary schools offered computer instruction (Naiman: 1988). In a 1995 survey of California urban public schools (a state which would be equivalent in land area to the

whole of Japan), computers for student use were found in well over 90% of elementary, junior high and high schools. At the college level, some U.S. universities even require freshmen to buy or own computers upon entrance because computers are vital links to library resources, Internet and conferences with professors.

In an informal survey of 12 Hokusei U.S. exchange students and one professor, 83% (10 out of 12) report that they use the computer almost every day on their home campuses, mostly for word processing and E-mail. Eighty-three percent of them also indicated an interest in studying Japanese through computer software.

Computer literacy is a professional qualification for American teachers. In order to be fully credentialed, California public school teachers must take course work which covers: educational computer issues, a demonstration of expertise of basic computer functions and common software and also the ability to incorporate computer-assisted instruction into the curriculum. These classes are having their effect because at least 50% or more of California teachers are utilizing computers with students according to a 1994 survey of California urban schools (Rosen & Weil: 1995). Other states, such as Massachusetts, have set similar educational targets, such as providing teacher in-service and setting state goals to install and connect computers in every public school in the state.

Computer use is fast becoming another aspect of globalization in education for Japanese students going abroad to developed countries. Many language resource centers and most libraries located on American university campuses are equipped with computers. These are the first places where ESL students go for help and study. Without prior exposure to computers, it is an added weight for students already burdened with second language demands and also for the host institutions.

In 1995, the Japanese Government declared a multimedia age in telecommunications. This is spurring nation-wide development

as well as public awareness and higher expectations of schools to offer the latest in high technology information.　Where do we go from here?

II. A BRIEF INTRODUCTION TO CAI and CALL IN EDUCATION

　　Computer-assisted instruction or CAI was the first introduced in the United States thirty years ago.　It referred mainly to computerized drill and practice exercises, tutorials, simulations and games.　Tutorials were used to introduce new materials whereas drill and practice reinforced materials already presented.　Simulations and games allowed students to apply and experiment with what they learned.　(Merrill (1986), In Dunkel: 1995, p. 28)) Although CAI and CALL are closely related, CALL limits itself to computer assisted programs specifically for foreign or second language learning.　In Japan, many CALL teachers became interested through teaching composition via word processing.　Presently the sophistication of multimedia and compact discs has allowed software to expand to listening comprehension and speech because they combine high quality visuals and voices with on-call text and references and self-recording.　Voice recognition features is also on the horizon which will break new ground in interactive features.　It allows the computer to "understand" the learner's vocal response and respond accordingly within a range of speech which is inputted by the teacher.

　　In U.S. institutions, CALL may exist as a part of the classroom curriculum or may be given as adjunct instruction or independent study in language resource centers.　Unfortunately CALL teachers have been victimized from a misconception that their enthusiasm with machines has somehow usurped language teaching priorities.　To the contrary, CALL teachers have always been concerned with the efficacy of good language teaching and have basically

viewed computers as a co- partner in education. Unfortunately, the research base for this relatively young discipline has been lacking, a fact which partially contributes to a negative image. [Kitao: 1995]

Dunkel (Dunkel: 1991) outlines the primary research questions in CALL as:

1. What kinds of CALL lessons augment development of particular L2 skills, such as reading and listening comprehension, oral proficiency, knowledge of grammar?
2. Does small-group work at a computer terminal generate conversational interactions among group participants and if so, what is the quality and what are the constituents of the discourse generated.
3. Do certain features in the design of CALL courseware affect the quantity and quality of student learning?
4. What types of CALL programs should be incorporated into the second language curriculum?

Many teachers have been waiting for the final word on the efficacy of CALL from research before committing themselves. But in all fairness, in the real world of every day teaching, teachers do not wait for literature to prove or disprove an approach before they implement it. The majority become researcher- teachers who learn by trial and error, evaluating what works or doesn't work for their students. There is a sense of urgency now that the high tech age of information has arrived. More CALL teachers will hopefully to take up the challenge.

III. THE APPEAL AND CHALLENGES FOR COMPUTER -ASSISTED LANGUAGE LEARNING IN JAPAN

A. EASE AND EFFICIENCY IN LEARNING:
Individualized and Focused Instruction

Many English teachers in Japan recognize the value of CALL because it addresses some of the weaknesses of large class instruction so typical of college curriculums. CALL allows for more individualized instruction within (or outside of) a class setting. This places more learning responsibility on the student to demonstrate their comprehension of language rather than memorization of a lecturer's scholarship. When the learner is put in control, the lesson takes on personal meaning.

In the 1994 Hokusei study, "Student Response to Multimedia Listening Programs," the "my pace, my time, my way" was the most frequently mentioned attractions of computer study, regardless of language ability. For example, the repeat function was the most commonly used feature. It was amazing to see how much repetition students self-initiated, much more than occurs in the classroom setting. The graphics and text also encouraged longer periods of focused attention, but the main point was that the learners were gauging and deepening their learning to their satisfaction.

Students at their own computers could choose to repeat a difficult dialog five times and quickly skip over other parts already understood. The computer could give immediate feedback by replaying the utterance and bilingual glossaries on the screen or hear a Japanese translation. In comparison, the teacher in the classroom must intuitively guess what needs to be explained or passed over (especially in the case of Japanese students who hesitate to show their weaknesses). Teachers in large classes cannot correctly guess right 100% of the time.

In the classroom teachers often avoid excessive repetition

because of boredom, and the practical matter of time. Usually the native speaker teacher settles for global comprehension and when students can pick up the key words, they sail on. Japanese students especially worry about errors and to ignore that adds to their insecurity. So CALL programs do very well to meet their needs for accuracy.

Is any language learning going on at the computer screen? Only the student knows for sure. Maybe the first time they are trying to catch whatever words they know; the second time to confirm the pronunciation or intonation or maybe to hear the text in entirety. This is not mindless repetition, but purposeful listening. When asked to assess their progress, one EMMI student told us that she could only hear bits of words (language) at first, but gradually she began to hear longer phrases and sentences.

Some of this may have resulted from memorization, but increasing auditory memory is an essential building block of listening readiness. Another aspect is that more comprehensible (and visual) chunks of text were built into the software program rather than a word by word translation approach or the blur of native speaker speech. This is a key point for Krashen, et al, that input must be comprehensible and slightly beyond the learner's level for language acquisition. Some researchers (Wong-Fillmore: 1976, In Brown: 1995) point out that in the first year of acquisition, young learners build their language chunk by chunk (formulaic utterances). "These formulas were expressions which were highly situational in use and could be learned and used with the learner knowing nothing about their internal structures" (Fillmore: 1986, in Brown: 1995) And from that base, Wong-Fillmore believes language becomes elaborated and extended in daily use.

Some might say that conventional tapes and videos can accomplish the same effects, but the ease of multiple references and attractive multimedia graphics encourages students to stay longer on tasks

and as a result, they receive more language exposure.　Furthermore, whether tapes or videos are better is becoming a moot issue because multimedia software incorporates all these elements so we are not talking about separate items, but greater enhancements which students enjoy.

Broadly speaking, comprehensive reviews of CAI-CALL research have concluded that students on computer learned faster and equally as well as other mixed media lesson presentations. (Campbell, Duplass, Tjaden & Martin: 1995, Dunkel, Kuklik: 1991). Language learning is a time-consuming process so whatever parts can be learned more efficiently probably should.

B. "GO-BETWEEN INTERACTION"

Although we can acknowledge the positive effects of CALL, a distinction should be made between the learning of expository content and discrete subject matter like math or science and language acquisition.　Language learning is a complex of skills, many of which are cognitive-based and influenced by social, emotional and cultural and first-language factors to a greater degree than the learning of a biological fact or applying a mathematical formula.

Certainly we would like to have all our students motivated to speak face to face with native speakers, but most Japanese students do not.　Putting a foreign face in front of the classroom does not necessarily insure language acquisition.　Students can learn from what is given, but they determine very much what language they want to retain and produce.　If students are eager to make foreign friends or learn about foreign cultures, then, communication becomes self directed and meaningful in itself.　Teachers find these learners the most motivated.　However, all learners do not come in the same mold and others can be motivated by task-oriented activities or where they must seek information through the foreign language.　It is a plausible case for why computer-assisted learning appeals to

some more than others and why certain types of software hold interest longer than others.

For Japanese students, there is an important "go between" principle that computers provide which may lower the "affective filter", that is, non-cognitive factors that block learning. Basically Japan is a culture where face to face social relationships evolve from family, neighbor and work ties first. So face to face encounters with strangers need a "go-between". Computers are convenient go-betweens for Japanese learners to rehearse their language before they jump to real face to face encounters. And advanced students can now use the Internet to conduct transoceanic "chats" or discussion groups with foreign speakers. So in a word, the computer and its accompanying software have made foreign language speakers and authentic models more accessible to EFL learners. This is a breath of fresh air for the EFL classroom, but the problem is now how to utilize this authentic material in a way that will facilitate learning for students without overwhelming them.

C. WHERE COMMUNICATIVE-BASED TEACHING MEETS CALL

"I wish the computer would talk back to me." Indeed this is the weakness of present CD-ROM programs and why many teachers prefer the usual communicative activities or become so interested in Internet. Some of the rationale for communicative-based teaching is that the more students use the language the greater possibility that "negotiation of meaning" occurs. This interlanguage that occurs between two second language learners or between a NS and a learner serves to clarify, simplify, restate, redirect a message so unmodified language can become comprehensible. Pair and information gap activities are typical ways to elicit this kind of exchange. (Pica: 1994)

However theory has a hard time in the real EFL (English as a

foreign language) classroom of large classes. The negotiation of meaning is greatly dependent on the level of proficiency and the cooperation of the learners. When dealing with low level learners. it is more often the case that the negotiation of meaning occurs in Japanese, not the target language. It is an effective approach when the interlocutor is a native speaker, but with only one EFL teacher and 40 students, the returns are diminished.

From personal experience, communicative approaches work rather well with the intermediate and above range of Japanese learners in smaller classes. And although lower level learners also need such exposure, their abilities are more fragmented and their confidence more vulnerable. On one hand, they need communicative type activities, but on the other hand, some individualized instruction might consolidate their development. In a 1983 review of the litera-ture, Fisher (Dunkel: 1991) has asserted that certain CAI programs work especially well with slow learners and underachievers. More up to date research on the efficacy of CALL programs according to student ability is certainly called for.

In the case of Japanese students, slowness may disguise the need to self-reflect while activities are in process which is difficult in fast-paced communicative activities. Often communicative lessons seek to maximize unconscious language acquisition by enjoyable and meaningful activity, but some learners may need to internalize some of the language process to feel progress. In the EMMI study, stu-dents seem to enjoy the "my pace, my time, my way" in individual sessions partially because they had time to reflect and concentrate on the language while the lesson was going on, plus the advantage of immediate feedback.

As a teacher-researcher, I can see a great potential for CALL lessons enhancing communicative activities by extending it into the other two skills of reading and writing or by providing more authen-ticity to activities. For example, after a planning-a-picnic lesson in

a non-CALL class, students can become members of an e-mail list group composed of ESL students from all over the world. Together they plan a cyberspace picnic: they negotiate the date, the place, what to bring, etc. (Robb: 1995) All of this dialog can be saved and reflected on. Teachers also could have a record of which students participated and what they said. Later students could also re-enact the authentic dialog in skits with more context-meaning then a textbook one. Cultural points can be noted. Language strategies by various speakers can be pointed out and error correction could be addressed without threat.

D. COLLABORATION AND INTERACTION

Interlanguage has also been studied when groups have been assigned to a CALL task. What conditions would enhance talk? Would the quality of talk be different? Distinguishing traits between CALL groups and non-CALL groups have been: 1) shorter turns and numerous backchannel or short responses, like "yes, maybe, etc." 2) two-three member groups were most optimal, larger groups tended to become more competitive, 3) cooperative activities produced more task-related talk rather than competitive and individual tasks. (Dunkel: 1991) Generally results are mixed and suffer from the same difficulties that non-CALL activities have: mixed levels, gender influences, task differences, dominating partners. What is paramount in these studies is not the effects of the computer particularly, but how much interactivity was built into the lesson and was the role of computer to participate as a partner or just a display tool. So here teacher design of the CALL task and attention to communicativeness become very important.

More CALL research must be done in the future with Japanese students in EFL situations to discover optimal conditions for learning. EMMI students were allowed to choose if they wanted individual study or to study in pairs. The majority of the students chose

to study individually because of scheduling difficulties, but they also felt less inhibited to go ahead without having to consider their partner's needs. Those who did choose pairs valued the feedback of their partner, but complained that the software did not not have tasks geared for pair work. Software programs, if they are to stand alone must cater to pair work as well as individual tutorials.

IV. A POSSIBLE FOUNDATION OF CAI-CALL

Besides practical issues of adequate hardware and CALL software, there are also some philosophical differences concerning how knowledge evolves for learning and how student-centered or teacher-centered style a particular CALL classroom is. One will be briefly discussed.

Constructivism (Brown: 1986, Stahl, 1995)

This theory is often presented in contrast to behavioristic approaches where facts are logically sequenced and skills must precede step by step and the knowledge is simply transferred to the learner in a linear fashion. Constructivism starts from the individual learner's conceptual context. When the learner's framework is altered during the process of comprehending the environment, then, learning takes place. A curriculum of this sort might rely more on the development of cognitive language skills and venues where resources can guide this learning. In pragmatic terms for CALL education, "It implies that teachers must creatively structure the learning environments of their students to provide opportunities for discovery and must guide the individual learner to reach insights in their own ways." (Stahl: 1995)

When students feel free to learn on their own, those students will also interact with the computer in a way that fits their language

needs. For example, an EMMI student wanted to brush up keyboard skills, in addition to English practice so she used a CD-ROM designed for vocabulary and listening. She listened to and typed masked or unmasked sentences which were dictated by a native speaker. Colorful photos accompanied each new set of sentences. After the typing, she compared the correct spelling to the original text. She felt that she was "killing two (many) birds with one stone" and was enjoying it, too. Here the student was able to design her own learning construct by using the computer as a tool, tutor and tutee.

In closing, innovative CALL settings, like language media centers or CALL courses, can extend the learning in traditional classrooms. When students are allowed that freedom, a new construct unique to each learner is created and meaningful language learning can take place.

REFERENCES

Brown, B. L. (1986). Non-behavioristic learning theory and the language lab. In J. W. Larson (Ed.), *Planning and Using Language Learning Centers*. Provo, Utah: Brigham Young University, pp.134–163.

Campbell, J. O., Lison, C. A., Borsook, T. K., Hoover, J. A., Arnold, P. H. (1995). Using computers and video technologies to develop interpersonal skills. *Computers in Human Behavior*. 11, 2, pp. 223–239.

Long, G., Pence, H., Zielinski, J. (1995). New tools vs old methods: a description of the CHEMCONF '93 discussion. *Computers & Education*. 24, pp.262–267

Dunkel, P. ed. (1991). *Computer-Assisted Language Learning and Testing, Research Issues and Practice*. New York: Newbury House.

Duplass, J. A. (1995). Teaching software: Is the supervised laboratory effective? *Computers & Education*. 24, 4, pp.287–291.

Kitao, K. (1995). Students' evaluation of CAI English classes. *Doshi-*

sha Studies in English. 64, pp.117-160.

McCreesh, B. (1993).　Creating CALL: focus on the learner.　In *CALL: Theory and Application, Proceedings of CCALL2/CCELAO2, The Second Canadian CALL Conference.*　P. Liddell, (Ed.), pp.357-365.

Pica, T. (1994).　Questions from the language classrooms: research perspectives.　*TESOL Quarterly.* 28, 1, pp.49-79.

Robb, T., County, P, Holliday, L., Warschauer, M., Turbee, L., (Mar. 30, 1995) Launching your class into cyberspace with student lists. 29th Annual TESOL Convention, Long Beach, California. (Conference presentation)

Rosen, L. D., Weil, R. M. (1995a).　Computer availability, computer experience & technophobia among public school teachers.　*Computers in Human Behavior.* 11, 2, pp.9-31.

Rosen, L. D., Weil, R. M. (1995b).　Computer anxiety: A cross-cultural comparison of university students in ten countries.　*Computers in Human Behavior.* 11, 2, pp.45-64.

Sato, D., Hayasaka, K.　Student response to multimedia listening programs.　Hokusei Review, The Faculty of Economics. 33, pp. 259-276.

Solomon, M. B. (1994).　What's wrong with multimedia in higher education.　*IALL Journal of Language Learning Technologies.* 27, 2, pp.27-32.

Stahl, G, Sumner, T., Owen, R. (1995).　Share globally, adapt locally: software assistance to locate and tailor curriculum posited to the Internet.　*Computers & Education.* 24, 3, pp.237-246.

Tjaden, B. J., Martin, C. D. (1995).　Learning effects of CAI on college students.　*Computers & Education,* 24, 4, pp.271-277.

Weil, M. M., Rosen, L. (1995).　Psychological impact of technology from a global perspective: A study of technological sophistication & technophobia in university.　students from twenty-three countries.　*Computers in Human Behavior.* 11, 2, pp.95-133.

Wong-Fillmore, L. (1976).　The second time around: cognitive and social strategies in second language acquisition.　Doctoral dissertation, Stanford, California.　In B. L. Brown, pp.142-143.

APPENDIX

STUDENT RESPONSE TO MULTIMEDIA LISTENING PROGRAMS

Dale Ann Sato

Keiko Hayasaka

Out of random sample of four majors, 29 volunteer students were selected to participate in the EMMI (English Multimedia Interactive) Project. They were required tu use CD-ROM listening comprehensions programs on Macintosh computers at least twice a week for a minimum of 35 minutes in their free time. Pre and post-listening tests were given during the ten-week study period. At the end, questionnaires and interviews were conducted to assess the following factors.

1) General motivation to learn, sustained interest in EMMI

2) Language learning preferences and goals

3) Amount of listening comprehension exposure

4) Reactions to computer use and software features

Inteviews and questionnaires revealed that EMMI students enjoyed this type of English study mainly because they could learn at their own pace, in their own way and time. The multimedia format was also a factor in sustaining their attention on task. Average amount of listening exposure was equivalent to taking another 90 minute class of English Gains were also shown in pre and post-listening test results.

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From September to December, 1994, the first Hokusei study to investigate student response to English multimedia CD-ROM listening comprehension programs was carried out and positive results were noted. This points to a possible consideration of computer-assisted language learning classes (or CALL), into the curriculum. This paper will give a short overview of CALL and issues related to language learning under the following headings:

 I. Proliferation of computers in education
II. Short description of CAI-CALL,
III. Appeal and challenges for CALL: ease and efficiency in learning, issues of interaction, interlanguage, and collaboration
IV. Constructivism as one foundation

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