Integrating Tutors, Tools and Teachers

Ruskyle L. Howser*

The history of CALL applications has been largely one of unfulfilled promise and dashed expectations, due to ineffective teaching approaches, inadequate technology or a focus on entertainment, at the expense of teaching. A look at the roles the computer can play in the CALL lab gives an indication of how the computer can be used appropriately in the second language acquisition process. Only by integrating flexible and appropriate teaching methodologies with a clear view of the strengths and limits of computer technology can truly effective CALL based systems be developed.

Many endeavors in Computer Aided Language Learning (CALL) begin with the assumption that the primary advantages of a CALL based learning environment lie in the abilities of the computer to function as a substitute for the human teacher. If not an optimal manner in which to study a language, they posit, CALL at least stands to be a reasonable alternative for instances in which a human teacher was unavailable.

In discussing the potential for using CALL to supplement teaching methodologies, however, it is important first to take a hard look at exactly what the computer is and what it can, and cannot, do. A deeper examination of what the computer brings to the language learning environment shows that it cannot, and will not for the foreseeable future be able to, fulfill the same pedagogical functions as a human teacher or classroom. What it can do is bring its own strengths to the process as a valuable adjunct to the strengths of the traditional learning methods and environments.

The Counting Machine

The computer is, at heart, a counting machine, a machine that is controlled by a set of rules that tell it what to do in a given state and under a given condition. Change the rules and you change its behavior. That principle is the primary attribute of the "universal computer" first described by Alan Turing in 1936 (Weizenbaum). The rules, or software, allow any computer to mimic the functions and characteristics of any other computer. The software is the machine.

In theory, and with the correct software, a computer should be able to mimic the behavior of the human brain and the linguistic functioning of the native language speaker, and therefore replace the English teacher as the primary source of linguistic instruction, input and interaction. That presupposes, however, that we possess a full understanding of the brain and are able to program its functions and characteristics into the machine. We are clearly a long way from such an understanding; and failing that, it seems from such a perspective that we are doomed to fail entirely.

* Part-time lecturer, Faculty of Engineering, Tokyo Institute of polytechnics
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The Turing Test

Salvation comes, however, in the form of the "Turing test"(Weizenbaum). In Turing's later examination of just what it means for a computer to mimic human consciousness, he advanced the idea that, in the absence of a true understanding of the function of our own brains or thought process, any machine that behaves in a way that is indistinguishable, to an outside observer, from that of a human, even if the means by which it achieves that behavior is different from the means employed by the human brain, can be said to have achieved consciousness, for all practical purposes. Thus relieved of the necessity of understanding how the teacher thinks, the CALL application designer is free to focus on modeling those *actions* of a teacher that are fully understood.

For the foreseeable future, however, it seems unlikely that such a computer-based system will be able to pass the Turing test with any but the most basic of learners and basic learners don't have the linguistic skills required for making the interpretive leaps needed to compensate for the occasional breakdowns in logic and understanding that inevitably occur.

Store, Retrieve and Manipulate

Returning, however, to what the computer can do, which is, as Berberich (1998) restates Weizenbaum, to "*store, retrieve and manipulate any given data*", gives us the first inklings of how this machine can effectively serve the needs of the language learner. Language is data. If the computer can not be programmed to understand language, then it can at least be programmed to store a vast quantity of language data, retrieve and manipulate that stored data in ways that it is programmed to do and to repeat exactly those manipulations whenever called upon to do so.

All of this may seem self-evident, yet a perusal of both the history of CALL and the currently available commercial software products shows that it hasn't been evident in the development of most CALL applications. Some have been based on an approach to language teaching, such as the behaviorist/audiolingual approach, that has subsequently been found to be lacking in efficacy. Others were designed with an effective approach to language teaching in mind, but failed to take in to account the practical limitations of the technology available. Still others are designed to show off the latest technological advances in software and hardware capability, but without respect for what is currently known about the processes of second language acquisition.

Of Tools and Tutors

In order to understand the goals of CALL, it is necessary to take at least a cursory look at the ways in which computer aided instruction (CAI) has been conceptualized. There have been many attempts to categorize and systematize CAI practices. Probably the most widely accepted and useful conceptualization has been the Tutor, Tool, Tutee model, first advanced as the title of one of the first anthologies of CALL papers, edited by Taylor (Papert; Levy). The tutor and tool models are the most relevant to CALL. The primary distinction made by Taylor between the two is that in its role as a tutor, the computer is called upon to *evaluate* the learner's production, whereas in its role as a tool, no such evaluation is called for.

The Computer as Tutor

The computer as a tutor is probably the model that most comes to mind for most people, when they think about the CALL based practices. Such a model conforms to many of the traditional ideas that have long permeated thinking about education and computers.

When the first CALL applications were developed, particularly against the backdrop of the behaviorist theories about learning and the teacher-centered practices that predominated at the time, it must have seemed obvious that the computer would serve the same central role and function as the teacher did in the standard classroom. In many ways, the computer does possess some the ideal attributes required of a tutor. It is indefatigable, always available and accessible, able to reproduce exactly the same case and context every time, at any pace or level, and it is non -judgmental and infinitely patient.

Its many virtues aside, however, virtually all computer-based, language tutoring systems that have been conceived and attempted have been deemed at best to be qualified successes by those who have used them, and many were dismal failures. Unfortunately, it is the very strengths of the computer, the ability to crunch numbers and keep track of right and wrong answers, the explains the early prominence of tutoring applications (Hoffman). Immediate feedback is often touted as one of the strengths of this model, but the closed nature of the choices often given, usually from a set number of options, often precludes the kind of reflection and self searching required for second language acquisition. If it isn't A, then it must be B, so it's possible to find the right answer without ever having understood why one was right and the other was wrong. Immediate feedback of that type may be of dubious value at best (Garrett).

The problem lies less with the specific design or objectives of any particular application, and more with the instructivist model of learning itself. For while language may be data, language use is a skill. Learners' second language acquisition and subsequent performance are more than the sum of the knowledge they have taken in. Both are affected by cultural, sociological and situational factors (Ellis). Yet the standard instructivist, behaviorist, tutor model of learning ignores these factors.

That's not to say that language tutoring applications have no place in the ESL curriculum, but rather, that their role is necessarily limited by the failure of the computer, in all but the most predictable and rigidly defined contexts, to perform its primary tutoring missions, to flexibly generate naturalistic and appropriate language and to evaluate the learner's responses.

The Computer as Tool

With the rise of the communicative language approach to ESL teaching, the use of computers as tools in the learning process has become the dominant role. Word processors, email, dictionaries, thesauruses and concordancers, are just some of the many computer tools are used in language learning contexts. If the defining feature of the computer as tutor is the requirement that the computer evaluate the learner's language output, then it is the absence of that evaluative role that defines its role as a tool.

The computer, when used as a tool, is not in the role of evaluating the learner's production, thus

not usurping the teacher's role, but it also subtly changes the human teacher's traditional role in the learning process. Rather than the human teacher being the source of input for the learner, as in the traditional foreign language classroom, the learner and the teacher become partners in the exploration of the learner's efforts in a more task-driven environment, with the curriculum driven by the learner's efforts and the teacher responding when necessary to facilitate those efforts, but still retaining the ability to control the overall direction of the curriculum through the control of the assigned task and tool.

One subset of computer tools, Computer Mediated Communication (CMC) tools, shows great promise for use in a communicative language teaching curriculum. The internet, Email, chat groups, the internet and other systems that allow humans to communicate, over differences in time and distance that would previously have made such communication impossible, hold the promise of extending the learner's reach beyond the confines of the traditional classroom.

Unlike a tutor, however, a tool is not built towards any particular methodology or approach to language learning, so it's main strengths, the flexibility with which it can be used and its neutrality as to approach, are also its biggest weaknesses. It offers no particular guidance toward its use as a learning environment (Levy). The consensus among researchers is that autonomy without some guidance is unlikely to be successful (Soo). Without direct guidance, the learners' ability to make use of the tool effectively depends a great deal on their ability to make intelligent choices about how to study and learn a second language (Garrett). Unfortunately, one of the greatest advantages of a CALL based learning environment, that of the ability of students to work independently of their classmates pace or the teacher's hovering presence, is obviated by the need for such guidance.

Integrating tutors and tools

CALL has gone through many of the same stages of development that ESL as a whole has undergone. Whether it's the top-down, bottom-up processing debate in reading and listening comprehension or the battle over behaviorism and nativism, most fields have gone through the same struggle, beginning with the discrete point, synthetic, mechanistic, instructivist views of grammar and structure, then swinging the other way to the communicative focus on whole language and constructivism, before finally settling in to an integrated approach that values both approaches working in concert. Such an integrated approach in CALL is termed Large Scale Adaptive Call by Frank Berberich, who says, "Computers are good at precise storage, retrieval and manipulation of structured data such as text, images and sound, and are excellent at repetition. A teacher is good at spontaneous language communication and highly selective recall from a large database. . . . . . The ultimate CALL system-true LSAC-should likely combine the linguistic capabilities of a human teacher with the data storage, access and display strengths of computers." (Berberich, 1998).

Integrated Applications

One way to integrate natural language and the computer's data manipulation skills to supply a communicative, naturalistic learning atmosphere, is to tie an extensive corpus of authentic, natural language to a flexibly programmed range of pedagogically sound, constructivist learning exercises.

A suggested application that would take advantage of the inherent strengths of the multimedia channels available in modern computer systems is a system of reading or listening support software. A truly effective system would allow the learner to select the support options, or scaffolding, that coincide with his own learning style, either by selecting individual support options or by choosing an overall approach from several options designed with sound pedagogical goals in mind. If the system used authentic, natural language examples, such as famous books, movies, speeches or news reports, when appropriate to the learners level, it would be approaching the level of a kind of universal receptive comprehension practice system.

Conclusion

The biggest problem with any pedagogical approach, learning system, textbook line or CALL application that has been developed is that every learner is different and every situation unique.

The CALL options holding the most promise are those that integrate a large number of lesser applications towards the goal of giving the learner an experience of structured autonomy, freedom to explore within an acquisition rich environment, with the support they need when they slip, as well as providing the teacher with a flexible range of pedagogical tools. As the technology becomes more powerful, many other options will become available to both teacher and learner. The basic principles, however, will not change. Machines and humans always have, and always will differ. Success invariably comes from the integration of our strengths to compensate for our weaknesses.

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