Where Is Computer Technology Taking Us?

Peter C. Patrikis

ADFL Bulletin Vol. 26, No. 2 (Winter 1995), pp. 36–39
ISSN: 0148-7639
CrossRef DOI: 10.1632/adfl.26.2.36

Where Is Computer Technology Taking Us?

Peter C. Patrikis

ADVANCED computer technology, which seems to change day by day before our eyes, is breaking down barriers and breaking rules. The language laboratory was once a separate facility, used almost exclusively by students of elementary and intermediate language courses to listen and record and later, with the introduction of audiovisual equipment, to watch videotapes and television transmissions. The walls of that facility began to crumble with the advent of the Walkman: tapes circulated, and many language labs lost a captive audience. If I had to summarize my observations, I would state briefly, "Everything is changing" and "You can't do it alone."

With the introduction of computers and network connections we are seeing new physical configurations on our campuses. What we once called the language laboratory has evolved in many colleges and universities into a foreign language resource center, a humanities resource center, or an international resource center. Such facilities require close ties with audiovisual services and with humanities computing services—indeed, in some institutions, these facilities have been amalgamated—and on some campuses the facility is part of the library or is encompassed within the library's domain over information technology. No longer the exclusive domain of foreign language programs and departments, the language laboratory has been realigned physically and administratively to serve a wider function and a broader audience. This realignment teaches us an important lesson: the development of computer-based activities cannot and should not be left to lone rangers. It requires the association and cooperation of individuals in different parts of our institutions who have not traditionally known, or worked with, one another.

The original language laboratory institutionalized and enshrined the audio-lingual method: students sat in Pavlovian booths to mimic and memorize, parroting invisible drill masters. Even with the advent of the communicative approach, audiotapes leave students with routine activities like listening to dialogues, repeating phrases, and answering simple and simplistic questions. Videotapes and satellite television broadcasts have brought an admirable variety of authentic materials, but their use follows a familiar pattern: the instructor prepares a question, and the student responds. This dual mode of watch and respond tends to favor description over reflection and comprehension over critical understanding.

Not quite twenty years ago, I read an early book on computer-assisted instruction (I do not recall the author or title). I remember two things from the book: a limerick and an anatomy of computer functions. The limerick is still a good one, replete with classical allusion and our modern obsession with sex:

> Word has come down from the dean
> That by aid of the computing machine
> Young Oedipus Rex
> Could have learned about sex
> Without ever touching the queen.

The anatomy of computer functions proposed the following quadripartite division of computational labor: the machine could serve as a teacher, as a tutor, as a tester, and finally as a student. (The last function is the most radical and innovative, since it calls for the student to convey the data and the structure of knowledge to the machine.) Not surprisingly, that prototypical anatomy has fallen short of the mark; it failed to include other important functions that are now common, including hypertext, translation, and the building of concordances, glossaries, and lexica. What earlier pioneers did not see—and I have here only the wonderful gift of hindsight—was the application of a computational device to text manipulation and multimedia presentation. Earlier versions of computer-assisted instruction, though developed by visionaries, in fact reflected relatively traditional notions of pedagogy. Our forebears in the ancient days of the 1960s and 1970s do not appear to have recognized that

The author is Executive Director of the Consortium for Language Teaching and Learning. *This article is based on his presentations at ADFL Seminars West and East, 2–4 and 23–25 June 1994, Monterey, California, and Albany, New York.*

one can learn with tools and by using tools, that indeed a variety of activities (rather than simply pedagogical tasks) can promote learning.

That quadripartite anatomy also rendered the role of the computer rigid, narrow, and unidirectional. The definition of the computer as teacher, tutor, and tester left the machine (and the invisible teacher) in charge: the computer was the primary agent of interaction, whereas the student reacted to stimuli from the machine. Even today most people conceive the computer as having this limited agentive function, as if it could only be an alternate teacher. This restricted notion of teaching and learning as a kind of linear quid pro quo leads many administrators to think, to wish, to hope that machines will replace teachers and thus save money and headaches. But just as the ability of the computer to treat text, sound, and image has developed beyond our original notions, so too have other possibilities for teaching and learning arisen, where the computer serves as one instrument—or tool—among many in creating an enriched and stimulating learning environment.[1]

The agentive preconception guides much curricular development involving computers. Unfortunately, many people working in computer-assisted language learning have not recognized the new possibilities and the new territories for teaching and learning; much of their effort has not moved beyond traditional notions of teacher, tutor, and tester or beyond earlier models and theories of language acquisition. One often hears such work defended with the argument that it moves onto the computer platform and out of the classroom activities that do not need to be done in the classroom. Consequently, we see a lot of boring drills, creating merely a high-tech version of "drill and kill." After all, if an activity is boring in class, why would it be any more enthralling or effective on a cathode-ray tube? In other words, for many people, computers are one more thing to dump into the handbag of pedagogical stunts, another example of doing the same old thing in some new way.

In the humanities, the computer has principally functioned as a glorified typewriter, and word processing (what we used to call typing and editing) has become second nature to most of us. Word processing liberated masses of foreign language teachers from their scribal chores; few of them, however, saw the computer as useful for anything besides another form of typing. One of the first breakthroughs in abandoning—or, better, in building on—the traditional paradigm was a French writing assistant, *Système-D*, by James Noblitt; this program combines word processing with access to lexical and morphological databases, thus providing the student with resources for writing and for reflecting on the problems of writing in a foreign language. (A Spanish version, *Atajo*, and a German version, *Quelle*, which have been built on the same model, are due presently.)

Noblitt's innovation is twofold: *Système-D* is obviously task-based in orientation, and it allows the student to explore possibilities of the language. The program employs the instrumental aspect of the computer: the student is in charge, fulfilling a task, exploring at will, using the machine as a tool. Those same features characterize the multimedia developments of the Laboratory for Advanced Technology in the Humanities at the Massachusetts Institute of Technology. The laboratory's interactive fiction *A la rencontre de Philippe* (Furstenberg) offers students, working individually or collaboratively in groups, multiple opportunities for exploratory learning through a branched story where the decisions made by students have real consequences in the development of the narrative. By participating in the story—a tale of girl throwing lazy boyfriend out of her apartment, and he, inept provincial that he is, having in one day to find a job and a place to live—students fulfill tasks to make the story progress. The task orientation spills over into varied classroom activities. In addition to the rather amusing fiction, the *Philippe* videodisc program allows the instructor to present all segments of the story that illustrate certain discourse functions or metalinguistic elements: ways of answering a request negatively, ways of expressing surprise, ways of hesitating, and so on.

I have heard many people exclaim, when they have learned of this program, "Oh, but we cannot afford to do that kind of thing." Of course not, and no one is expected to! Whence my statement at the opening of this essay that no one can go it alone. The not-invented-here syndrome is financially disastrous in computer applications, and the reinvention of the diskette, if you will pardon the pun, is a waste of time, money, and human resources. We can all profit from the years of research and development and the hundreds of thousands of dollars that made this program possible. And we can rejoice that other interactive programs are being developed at MIT in Spanish (*No recuerdo*, a fiction in which the user assists a Colombian scientist who has fallen victim to an amnesia-inducing chemical of his own creation), in Japanese (*Tanabata*, a documentary on contemporary Japan), in German (a documentary entitled *Berliner sehen*), and again in French (*Le quartier Saint Gervais*, another documentary on history and change in a Parisian neighborhood). Multimedia applications like these bring the outside world into the classroom and the laboratory.

However brief my descriptions are, I hope that the special-feature benefits these projects offer are evident: flexibility and adaptability. Both as tools and as curricular materials, the programs can be used with beginning students on the first day of class or with third- or fourth-year students. In other words, these resources can be continually recycled for use at different levels and for different purposes. There should be no such thing as an Intermediate-High video or a Novice text.

The development of computer-based tools for teaching, learning, and research is a propitious turn and a step beyond authoring systems that tend, in my view, to be locked into the agentive past. Another major tool I would like to mention is *annotext*, the multimedia text annotation program developed at Dartmouth College. This program allows the teacher of language and literature easily to add a wealth of multimedia annotations to a text. One exemplification, developed by Bruce Duncan and Otmar Foelsche, includes all the text of Goethe's *Faust*, access to videodiscs of two different stage productions, the text of the ur-*Faust*, digitized images of Goethe's manuscript, an online German-English glossary, an English translation, commentary, and other elements. Carol Bardenstein, of Dartmouth, is using the application to create an Arabic resource that includes selections from the Koran and the hadith, readings from newspapers and journals, selections from contemporary plays and movies, news broadcasts, Yasser Arafat's recent speech at the White House, and the like; one extraordinary "text" is a 1940s Egyptian musical film in which young women dance and sing to the paradigms of literary Arabic. Need I state the obvious? The computer, operating in such modes, can serve the study of literature and expand the study of language in line with current trends in foreign languages across the curriculum.

The resources that are available and that will become increasingly available on computer networks open the closed laboratory and classroom to a vast world of potential. At the University of Pennsylvania, the curricula for Arabic (under the direction of Roger Allen) and Hindi (under the direction of Surendra Gambhir) are being moved onto the campus network: textbooks, illustrations, maps, audio drills, film clips, and the like will be available to students. At MIT Shigeru Miyagawa is directing a project to move large portions of the Japanese curriculum—assignments, syllabi, kanji drills, vocabulary exercises, and reading—to the Athena network (Miyagawa). In the long run, these and other resources will be available on the Internet as part of a new moderated Global Japanese Instruction Network.

With the explosion of the walls of classroom learning, it should be evident that the traditional roles of teacher and student are likely to change dramatically. As many colleagues acknowledge, the teacher will become a designer of tasks: he or she will no longer direct what students do but instead will create an environment of expectation and of possibility, where students are responsible for what and how they learn. I would like to pause, for a moment, on the word *responsible* and to play with its meaning. The term *responsibility* gives a new, and perhaps higher, sense to the notion of a student-centered course. This responsibility entails the willingness and the duty of students to assume control of their learning and of their capacity to provide answers. In other words, it requires them to respond to their own intellectual needs and to their classmates. John Barson, of Stanford University, has for several years been teaching in an electronic classroom, using the tasks of student communication to create a lively environment of real and virtual discussion; Barson has classes communicating across the university and across the country and has fostered a climate of motivation for the acquisition of skills and for accurate performance.

Allow me to prognosticate. With the wide variety of resources that will easily become available, it will be up to students to determine how they best learn. Some students demand a heavily cognitive approach, with everything explained and written out; these students will enjoy access to an online reference grammar. Other students seem to learn inductively from example and require no such explanations; they will use a contextual grammar that elucidates by example. Some students can whiz through alphabetical vocabulary lists as easily as a pianist can play the C major scale, while others want to see and hear words used in context. Some students want to look words up in a lexicon to find a synonym in the target language; others want English equivalents. We already have online lexica for several languages (produced by *dhglossary*, an application developed at Dartmouth); with the available templates, the task of producing new and enlarged glossaries is relatively simple and cost-efficient. We already have examples of a collocational lexicon (a Russian version has been done by Slava Paperno at Cornell). We are close to having a real dictionary (that is, a lexicon that speaks to us), and a "pictionary," a lexicon with pictures, can be created easily. It will not be pedagogical fashion that dictates what is student-centered and what is not; the student will make that determination. In short, multiple resources allow multiple approaches and disengagement from methodological dogma and dogmatic methodology.

Lest you think that I am presenting a utopian, impractical vision of things to come, let me tell you some good news and some bad news. The good news is that the various possibilities I have described are more than possibilities: they are existing, developed work, the result of hundreds, and sometimes thousands, of hours of work. The bad news—should we choose to call it bad news—I stated in my opening sentences: everything is changing. Technology is no simple solution to problems: it creates new problems. While computers are not likely to replace teachers, they are equally unlikely to make poor teachers gifted. The simple and often-heard phrase "the integration of the computer into the curriculum" is a false lead. Once introduced in any meaningful way, the computer changes everything. The computer changes the locus of language learning, for the network brings teaching and learning to the computer cluster (wherever it might be on campus), to the dorm, to the home, to the instructor's office. The computer extends the classroom in time and

in space. For the sake of optimism, let us state simply that computers will continue to present us with challenges.

Computer technology calls for money, which is difficult to procure in these hard economic times; it requires money not only for equipment but also for space, maintenance, and security. A computer requires software, even though that simple observation has been lost on some administrators who have budgeted considerable funds for hardware and none for software, as if turning on the machine were sufficient. A computer requires teacher training and faculty development for effective use of the machine in different contexts. Again I must state the caveat: No one can do it alone. Cooperation and collaboration are called for. Applications require money and time, and I do not know many foreign language teachers with loads of spare time on their hands. Moreover—let us be honest—few institutions consider developing a computer application the equivalent of producing even a mediocre piece of scholarship, so the computer challenges our notion of scholarship and offers yet another challenge to the governance of foreign language problems.

So the bad news is not really so bad, but it is not easy news. When I first spoke of the startling effects that computer technology is having on teaching and learning, I meant those terms in their broad senses. The interrogation of the title of these remarks—"Where Is Computer Technology Taking Us?"—is rhetorical. No one really has an answer, but it is clear that while we seek to find answers, we shall redefine what it means to teach and to learn.

Note

[1]For insight into, and the distinctions between, agentive and instrumental functions, see Herrmann; Barson; Barson, Frommer, and Schwartz.

Works Cited

annotext. Diskette. Hanover: Panda, Dartmouth Coll., 1993.

dh-glossary. Diskette. Hanover: Panda, Dartmouth Coll., 1993.

Barson, John. "The Virtual Classroom Is Born: What Now?" *Foreign Language Acquisition Research and the Classroom*. Lexington: Heath, 1991. 365–83.

Barson, John, Judith Frommer, and Michael Schwartz. "Communication, Collaboration, and Task-Based Foreign Language Learning Using E-Mail." *Journal of Science Education and Technology* 2.4 (1993): 565–84.

Furstenberg, Gilberte. *A la rencontre de Philippe*. Videodisc. New Haven: Yale UP, 1994.

Herrmann, Françoise. "Instrumental and Agentive Uses of the Computer: Their Role in Learning French as a Foreign Language." Diss. Stanford U, 1990.

Miyagawa, Shigeru. "A Japanese Language and Culture Program at MIT: Building a Technologically Advanced Environment." *Consortium News* (Spring 1994): 35–39.

Noblitt, James, D. Solá, and W. Pet. *Système-D*. Boston: Heinle, 1992.

A computer is a machine that can be instructed to carry out sequences of arithmetic or logical operations automatically via computer programming. Modern computers have the ability to follow generalized sets of operations, called programs. These programs enable computers to perform an extremely wide range of tasks. A "complete" computer including the hardware, the operating system (main software), and peripheral equipment required and used for "full" operation can be referred to as a computer system Many technologies (e.g., GPS and the Internet) were initially created or started with a defense-related purpose. Today, computers are still an important aspect of the defense industry. Encryption - Secure communication is vital in the defense industry and computers encrypt communications that should remain secret.Â The medical field is another place where computers are vital and used every day. Below are examples of how computers help those in the medical field. Medical records - More and more medical records are being digitally stored.Â Learning - Computers can take the input given by a robot and take that information to help learn and adapt to new conditions. Simulations. We input information, the computer processes it according to its basic logic or the program currently running, and outputs the results. Modern computers do this electronically, which enables them to perform a vastly greater number of calculations or computations in less time.Â It took up 167 square meters, weighed 27 tons, and consuming 150 kilowatts of power.Â Popular early microcomputers which did come in kits include MOS Technology KIM-1, Altair 8800, and Apple I. Altair 8800 in particular spawned a large following among the hobbyists, and is considered the spark that started the microcomputer revolution, as these hobbyists went on to found companies centered around personal computing, such as Microsoft, and Apple. Personal computer A personal computer is a computer that can perform all of its input, processing, output, and storage activities by itself. A personal computer contains a processor, memory, and one or more. input, output, and storage devices. Personal computers also often contain a communications device. Two types of personal computers are desktop computers and notebook computers. Mobile Computers and Mobile Devices. A mobile computer is a personal computer you can carry from place to place. Similarly, a mobile device is a computing device small enough to hold in your hand. The concept of a computer did not materialise ivernight. Over the ages, the computer took thousands of years to mature. Ancient people used stones for counting or made scratches on a wall or tied knots in a rope to record information. But all these were manual computing techniques. Attempts had been going on developing faster computing device used by man. Around 3000 years before birth of Christ, the mesopotamians quite unknowingly laid the foundation of computer era. They discovered the earliest form