

LAB NOTES

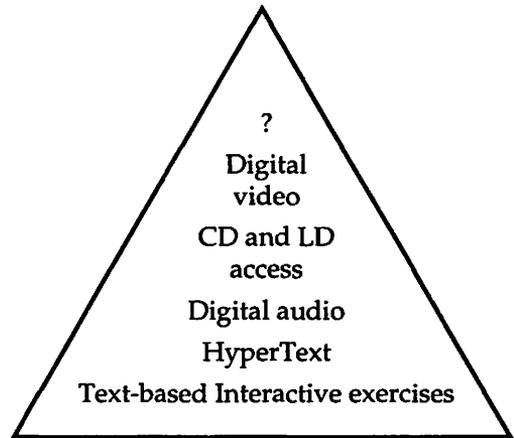
COMPUTERIZING LANGUAGE INSTRUCTION: POSSIBILITIES AND PITFALLS

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Over the last three years at Bentley College a modest amount of resources and substantial effort have been dedicated to the premise that computing can be of help in the acquisition of foreign languages. In the process, advances have been made, new tools discovered, and some essential perceptions of the limits of technology-based tools have come into focus.

This account is about practice—what has been done, what is being used and developed. It is also about the dangers, in times of shrinking funding, of linking oneself to an industry where software and hardware obsolescence is roughly biannual.

A basic premise at Bentley has been that development should be pyramidal. At the base are a mass of authoring-system-produced, text-only, interactive drills. The next step up is occupied by Hypertext, a loose designation which can include other media, but can also include straight text with



reference or gloss links to other textual material. Moving up, we find digital audio, which can mean either using the computer as an expanded-capability, random-access tape recorder (with all that implies for the language laboratory environment) or merely using sound to enhance formerly text-only documents. Our next area of priority is providing easy and efficient access to the growing amount of material which is available in the compact disc and laser disc formats. Digital video is just beginning to present itself as an area of interest, yet has serious

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drawbacks, for the moment, which prevent it from being a major priority.

Text-based interactive exercises are most easily produced with the help of supplied templates, called "authoring systems" in computer jargon. Examples of authoring systems are Calis in the DOS (IBM and compatibles) domain, MacLang, Dasher and Private Tutor in the Macintosh domain. Most authoring systems have similar capacities—they allow the quick and easy creation of standard exercise types: fill-in-the-blank, multiple choice, cloze, reading comprehension, word order. The advantage of any one of them has little to do with program design: those that are still around and supported have features which are essentially identical and adequate within their intrinsic limitations. What determines the quality of this sort of exercise is input and interface.

There are two input issues, essentially unrelated. The first, and most important, is quite simply what is known in the housing industry as sweat equity: gains in the value of real estate due to an input of labor. Labor is even more important in computing. Most reasonable computer authoring systems allow for computer feedback to multiple correct and incorrect student answers. For example, a student filling in a verb exercise with the following prompt *J' (être) _____ à l'école quand JFK a été assassiné* would receive an explanation about sequence of verbs for answering *ai été*, a hint to check the conjugation for *était*, and a hint about accents for *étais*. None of the authoring systems can do this work well for you (other than for basic corrections like accents).¹ Inevitably, the quality of this type of exercise is directly dependent on the quality and quantity of messages available and the accuracy of the predictions of student response. There is only one reliable source for this material: experienced teachers.

At Bentley the input of the questions can be done by our native-speaker tutors, using MacLang. We have accumulated substantial banks of exercises in four languages in this manner without, in the main, attaining a superior standard of quality. Native speaker is not synonymous with "teacher," as we know. If I ask them to predict student error, they do not have the necessary experience. They do not even necessarily have a strong grounding in the structure of their native language (which should come as a surprise to no one who has corrected a college essay in any language recently). A Spanish tutor, for example, predicted *estava* as an error for *estaba*. The b—v confusion is typical of Spanish speakers, much less so of native anglophones learning Spanish as a second language. A teacher would not make this sort of exercise-content error. To make it worthwhile for teachers to invest time in these materials, however, the second input issue, obsolescence, needs to be addressed.

Computerized exercises can become obsolete in two ways. First, they can be closely related to a textbook or program of study which is eliminated or radically changed, orphaning the exercises. The software increasingly offered free on adoption of a textbook is an instructive example. Its development chronically underfunded, its quality widely varied, textbook software can disappear with the change of an edition. Second, the hardware platform on which the exercises are based can be phased out completely or lose market share to such an extent that developers will abandon it for greener pastures. The Apple IIe is an example of the latter: deserted by Apple Computer, it must live with the hi-tech paradox of being everywhere in K-12 computing and destined to wither away in the very near future. Another example is the IBM RT workstation. It was the intended platform for Athena development at MIT, but hardly attained maturity before being abandoned

by IBM, leaving Athena with thousands of wasted person-hours of development time.

Avoiding this enormous waste of effort involves making decisions related to both pedagogy and process. A catholic approach to methodology is essential. If this year's intermediate class wants drills based on elements of discourse, don't throw out the grammar-based exercises: next year's method may have use for them. Having the computer help *at all* implies a recognition of the importance of cognition and correction, which flies in the face of recent proficiency and input theories of language acquisition, though it is consistent with a pragmatic approach. The important thing is not to panic; the arrogance of the latest fashion is hard to ignore, but it too will pass. An extensive catalogue of exercises reflecting a variety of approaches will always be a valuable resource—always, that is, if it is not locked into a software or hardware platform which passes on into that great (and exponentially expanding) hi-tech graveyard in the sky.

Avoiding that disaster forever is impossible, but certain precautions can temporarily save you tears. First, make sure that your exercises exist in text form outside of the authoring system. Ideally, this would be in an ASCII text file, which passes for a universally recognizable text encoding format. In the real world it's probably better to write the exercises in one of the two dominant word-processing applications, Microsoft Word and WordPerfect. These dominate the market to such an extent that, unless pen-based word-processing or some other radical departure should come along and sweep them away, they are likely to still be around a decade hence. In any case, you can save from either of them to ASCII format, should the need arise. In the Mac domain, with the new floppy drives, you can write and save in or to either DOS or Mac format. IBM compatibles and the

Macintosh are currently the only hardware platforms to consider, in that they now dominate the market and have just entered into an agreement on an operating system for the next generation of personal computers. The Mac GUI, or graphical user interface, is now totally dominant with the advent of Windows for the PC; choosing an authoring system with any other sort of interface is ill-advised. Word has it that the planned "pink" operating system now under joint development by Apple and IBM will give control of many of the GUI features to part-time developers (which category includes virtually all academic CALL toilers).

Hypertext is essentially text with links to information resources beyond itself. Apple's (now Claris's) HyperCard is the archetypal basis for this sort of development. Indeed, the hypertext concept became accessible at the grass roots only with the appearance of HyperCard. It allows for relatively painless linking of any word or phrase in a text to more text, sound, an image, even an animation sequence; all this without considering (yet) additional hardware beyond the computer itself.

Hypertext is used in Intermediate French at Bentley College in a series of "cultural environments," which prepare classroom interaction through exposure to cultural foci. Extensive use of digitized sound and imagery makes the units attractive to student users; achievement-oriented exercises help them master a core of vocabulary (sounded) and concepts. An electronic notepad is constantly accessible, as is a glossary integrating sound and imagery. These units can be used effectively on a Mac Classic, an LC or any of the Mac II line.²

HyperCard avoids some of the above-mentioned pitfalls often associated with academically developed authoring systems. It has been supported more or less consistently since its introduction in 1987,

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meaning that projects conceived in earlier versions of HyperCard are in the main convertible to later versions. Cross-platform compatibility is possible to an extent with the appearance of Plus and ToolBook in the DOS domain, although the process is still less than perfect.³ Obsolescence continues to be a problem, though here the Apple policy of supporting inter-application compatibility is a great help. Thus the building blocks in a HyperCard stack—text, sound resources, imagery, and now video—will probably be cut-and-pasted into whatever tool kit comes along next.

HyperCard presents another problem, however. Like the authoring systems cited above, HyperCard development depends on the participation of experienced teachers. MacLang has a learning curve of roughly 10 minutes; with HyperCard we're not so lucky. It is a powerful tool, and as such it should not be surprising that a substantial amount of effort is needed to reach the threshold of competency where real empowerment begins to be possible. At the moment, a number of people, including myself, are looking at ways of making specific uses of HyperCard more accessible to faculty who have not been able or willing to perceive its potential as being linked to their own. At Dartmouth, Otmar Foelsche has developed an application called *Annotext* which allows for establishing multiple links from a given text to notes, glossaries or other media through a system involving as many as eight mark-ups of that text. *Guided Reader*, developed by David Herren of Middlebury, is similarly oriented toward allowing developers of hypertext documents to establish links to various media without the need to program (not even in the HyperCard programming language, HyperTalk). The commercially available *PowerPoint* allows this sort of development as well.

There is a downside to this approach. HyperCard is an empowering tool kit once

a certain level of competence has been attained. However, to achieve maximum benefit, learning and using the HyperTalk programming language is essential. Avoiding it means that hypermedia authoring would come to involve little more computing sophistication than that currently required for word-processing, with a similar set of pre-determined options. This would certainly open this domain to a larger group of users, while simultaneously closing the door to the sort of relatively open-ended improvisation allowed by full access to HyperCard's potential.

Digital audio, or digitized sound, is the next step up the pyramid. At Bentley it is increasingly being used in ways that will soon replace the tape recorder. We have created HyperCard stacks to listen/repeat/record/playback and test recognition of the sounds of the alphabet in French, Spanish, Italian and German. We will be expanding these into more complete treatments of the phonic foundations of these languages, to be used in first-semester classes. Additionally, we have successfully digitized Japanese dialogues, integrating hide-and-show text and translation, record and playback functions, infinite repeat as well as dictation, all within HyperCard stacks. With the purchase of a network server with substantial storage capacity and the installation of an Ethernet network, we will be joining those who, like Robert Davis at Smith and Dan Church at Vanderbilt, are making random-access digital audio available over a network.

Related issues of copyright, site licenses for materials, and publishers' methods of delivering audio material to universities are in the process of being raised (not resolved). Part of the answer, as at Bentley, is to record your own materials, but this is clearly a temporary solution. The compact disc would seem to have a major role to play here in the very near future as a way of delivering

top-quality audio. Such audio would then be digitized onto servers, if not used directly in CD-ROM drives, which are now being offered as an internal option.

The possibilities for the learner in terms of control of the learning process are exciting in all these developments. The escape from a linear medium like tape into a random-access medium has intrinsic significance for the nature of the learning experience. The student's capacity to select, shape, intensify and repeat elements of an assigned task in the computer environment multiplies the necessity for engagement in order to complete that task, leading hopefully to increased acquisition in motivated students.

Compact disc and laser disc access has become an area of increasing importance. Discs can offer the sort of storage capacity which is necessary for working with audio and video, albeit so far in a read-only format. The compact disc is particularly attractive, in that the format is internationally standardized.

Certain types of material are readily available and lend themselves to interactive development. Music compact discs can be used to present difficult authentic material in a way which makes it possible for intermediate-level students to profitably work with songs on an independent basis. Using the Voyager CD-Audio Stack, we have developed HyperCard stacks that allow line-by-line access to the CD as well as line-by-line glossing. Even with inexpensive stereo headphones the musical experience is of excellent quality, and students are able to decipher and understand difficult lyrics on their own.

Eventually, software specifically developed for language study will be routinely available on CD-ROM in greater quantity and variety than at present. Since this format will also be used for digital video in the

near future, it seems like a relatively trustworthy investment.

Laser discs have been the medium of the future for some time now (humor intended). The fact that they allow extremely precise and relatively fast location of any frame in a film or video document is enormously attractive for interactive development. At Bentley we have used discs from Voyager, PICS (University of Iowa), and Films, Inc. We develop interfaces based on the need expressed by the faculty member concerned. The most basic interfaces simply allow detailed access to the material. I have developed authoring tools based on the Voyager VideoStack, which make it possible for work-study students to fully catalogue and develop a glossary for a given disc in a reasonable amount of time. Conceiving of tasks which would exploit this new material is an area where teachers must be engaged. At the moment, except in the case of materials developed for film study, the videodiscs are the first-demonstrated, but least-utilized of our materials.

Our film-study application is interesting, however. For Renoir's *La Grande Illusion* we have scene-by-scene (67 in all) access with accompanying bilingual notes and synopsis, a bilingual glossary and a "video clipbook" which allows for student selection and saving of parts of the film of any size for use in a class presentation. These stacks are used both for independent research and for in-class presentation and have proved to be revolutionary in terms of the approach they allow to what was previously a linear medium. Films on videodisc for the study of language are not such a boon, however. The format incompatibilities familiar from video extend onto disc, meaning that it is impossible (for the moment) to obtain films without subtitles—a serious drawback.

There are other drawbacks to the medium as an in-lab resource. Videotape is relatively cheap to reproduce and now extensively available, the format wars notwithstanding. Videodisc is much more expensive, and there is as of yet a discouraging lack of material. Some of what is available is dated and inappropriate already. The higher-quality discs, like those pressed in the last two years by Films, Inc., are priced for a tiny market, and therefore are very expensive. As a result, buying more than a single copy is fiscal suicide, and a single copy is virtually useless other than for classroom presentation. An encouraging sign is the pressing of selections from *France-TV Magazine* onto videodisc at a reasonable cost. Without more variety at lower cost, the medium will undoubtedly remain an under-utilized curiosity of infinite potential (other than at the military academies, where it is the basis of instruction).

Digital video is an area we at Bentley are currently aware of, but are resigned to watching wistfully from a distance for the time being. QuickTime for the Macintosh is exciting: being able to cut and paste video segments as if they were text and attach them to documents is an amazing development. Unfortunately, the memory required to store the most insignificant QuickTime movie (multi-megabytes for even 10 seconds) means that it is a medium which will be inaccessible to us, for all practical purposes, for the foreseeable future. Not that it will be inaccessible to everyone, by no means. All that is necessary is for read-write optical drives, with 128 megabyte floppy disks, to become the norm. That won't be long (a year or so) in certain sectors of the economy. As for colleges and universities, especially those undergoing the prolonged fiscal agonies of the '90s... I'll wait and see.

Copyright problems associated with the practice of digitizing video have, as for audio, only begun to be discussed. At an Apple presentation of QuickTime a company technician used a feature film which had been digitized and pressed to CD for his demonstration. When a language lab director asked him about copyright clearance for use of materials in this way, there was an embarrassed silence, then the reply: "Well, we really haven't thought much about that yet." Nor has anyone else.

In the meantime, there's plenty to be done with what we have. In computer-assisted language learning the problem is not one of the availability of tools; they exist and are satisfactory. Now we need to build the house; i.e., create significant quantities of well-thought-out software which support classroom practice. At Bentley we feel that at the very least we have laid the foundation.

NOTES

1. This is even more true with non-syntactic exercises (based on elements of discourse, functions, situations).
2. See C. Jones, "Transcending the Binary Bias: Building Cultural Environments with HyperCard," *The French Review* 64.5 (1991): 883-890, for a more complete discussion of these environments.
3. *T.H.E. Journal* recently carried a note on the "Cross-Platform Compatibility Project," looking into solutions to "permit portability of multimedia applications and content across different operating systems and computer hardware architecture." Members of the steering committee for the project: 3M, Apple, DEC, Kodak, IBM, Intel, Jostens, JVC, Lotus, Microsoft, NEC, Philips, Pioneer, Sony. *T.H.E. Journal* 19.7 (1992): 55.

**CONTACT INFORMATION FOR
VENDORS REFERRED TO IN THIS
ARTICLE:**

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Highway, Santa Monica, CA 90401
(213) 451-1383**

**France-TV Magazine, UMBC, ACIV Rm
146, Baltimore, MD 21228-5398
(800) 992-3788**

**PICS, 270 International Center, Iowa City,
IA 52242 (800) 373-PICS**

**Films Incorporated Video, 5547 N.
Ravenswood Ave., Chicago, IL 60649-
1199 (800) 343-4312**