

# Lessons from the past, lessons for the future: 20 years of CALL

by  
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This article was written in late 1996 and published as a chapter in Korsvold A-K. & Rüschoff B. (1997) (eds.) *New technologies in language learning and teaching*, Council of Europe, Strasbourg, France, ISBN 92-871-3255-0.

Inevitably, an article like this dates very quickly and there are many revisions in this Web version. Some important changes have taken place, but some things have hardly changed at all. Comments and revisions appear in **blue**, headed by **Author's update...**

[Lesson No. 1](#) focuses on the importance of ongoing training. This lesson is still as valid as ever. This is why I initiated the ICT for Language Teachers Project: <http://www.ict4lt.org>, which has been an overwhelming success, with visits now running on average at over 10,000 per month: see [Conclusion 1](#). I focus on training again in two articles that I have written: [Davies \(2002\)](#) and [Davies \(2003\)](#).

[Lesson No. 2](#) is full of warnings about regarding technology as the panacea. Dangerous characters still lurk in the corridors of education and there is still a tendency for technophiles to use new technologies simply because they are there rather than because they can really bring about major improvements in teaching and learning. This lesson is as valid as ever and has been substantially updated.

[Lesson No. 3](#) on choosing the right hardware is less relevant now than it was in the 1990s. The PC has virtually - perhaps regrettably - conquered the world, but careful decisions still need to be made about purchasing hardware: see [Davies et al. \(2012\)](#), which considers the decisions that senior managers, teachers and technicians need to make about hardware and software. See [Module 3.1, Managing a multimedia language centre](#), at the ICT for Language Teachers website.

[Lesson No. 4](#): I was a bit hard on Artificial Intelligence (AI). Machine Translation (MT)- which I also mention in this lesson - has certainly improved, but online MT systems such as *Babel Fish* still make horrendous mistakes: <http://babelfish.yahoo.com>. Having said that, *Babel Fish* works pretty well within its limitations, and providing you realise that it can only give you an indication of what something means rather than an accurate translation, it's quite useful tool. MT has taken a new direction with the advent of *translation memory* systems. See [Section 3 of Module 3.5, Human Language Technologies](#), at the ICT for Language Teachers website.

[Lesson No. 5](#) focuses on the importance of new ideas - still as valid as ever.

[Lesson No. 6](#): I was probably a bit too harsh about "Doing it yourself", as new authoring tools have made life a lot easier for the teacher who wishes to create his/her own learning materials. See these two modules at ICT for Language Teachers website:

- [Module 2.5, Introduction to CALL authoring programs](#)
- [Module 3.2, CALL software design and implementation](#)

[Lesson No. 7](#): The Internet has changed immeasurably since this article was written. Blogs, wikis, podcasts, social networking and virtual worlds have arrived. I have adequate bandwidth, but many people do not and the Web often runs very slowly at peak periods. I have added a substantial amount to this section.

[Conclusion 1](#): I have added three new references here: [Davies \(2001\)](#), [Davies \(2002\)](#) and [Davies \(2003\)](#).

[Conclusion 2](#): The CD-ROMs listed here are very dated. References to more recent sources have been added. The advent of the Web has pushed CD-ROMs into a poor second place.

For recent developments see my article: "Computer Assisted Language Learning: Where are we now and where are we going?" Keynote paper first presented at the UCALL Conference, University of Ulster, Coleraine, June 2005. Regularly revised: [http://www.camsoftpartners.co.uk/docs/UCALL\\_Keynote.htm](http://www.camsoftpartners.co.uk/docs/UCALL_Keynote.htm)

All of the hyperlinks in the article have been updated, dead links have been removed, and many corrections and additions have been made.

## **Plus ça change, plus c'est la même chose**

This article is a personal view of the developments I have seen in the course of the many years in which I have been working in the area of Computer Assisted Language Learning (CALL), with a few reflections on my earliest experiences as a user of language teaching and learning technology in the 1960s. Looking back over the years, it often seems to be a case of *plus ça change, plus c'est la même chose*. Yet it need not be like that. We desperately need new ideas in CALL, but it is equally important that newcomers to CALL learn from the lessons of the past.

## **Dynamic obsolescence**

In January 1993 a conference on Foreign Language Learning and the Use of New Technologies was held in London, organised under the auspices of the European Commission's Lingua Bureau and the DELTA Programme. At the last minute I was invited to express my views on the use of technology in a higher education language centre, and in the course of my impromptu talk I threw in the phrase "dynamic obsolescence" in a reference to the problem of hardware and software constantly becoming out of date. The phrase was

subsequently quoted in the proceedings ([EC Lingua Bureau/DELTA 1993:120](#)). I felt a bit guilty about that as I knew the phrase was not my own coinage, but I could not remember at the time where I had read or heard it. When I was commissioned to contribute to this volume, the penny dropped. I had read the phrase in a collection of articles by the British humorist Alan Coren, the paperback edition having been published, significantly, in the year when I embarked upon my new career as a language technologist: 1976. The context is worth quoting in full as it is highly relevant to the problems we face in language technology:

A number of my contemporaries actually chose to go into the Foreign Office: if they read Arabic at university, they were swooped on by Whitehall and sent to Japan; if they read Japanese, they were sent on a special FO training course to learn German, and subsequently placed in Kampala; if their predilection and brilliance were commercial, they were given posts where political expertise was the sole requirement; if they were geographers, they were despatched to found hospitals or advise on fowl pest. In short, as soon as they had completed the long and arduous process of learning something, it was no longer required. They were in a state of permanent dynamic obsolescence. My entire life has been like that. ([Coren 1976:11](#))

I share Alan Coren's feelings. As a medieval Germanist, turned modern German language teacher, turned language technologist, most of my life has been like that - which brings me to the first lesson we can learn from the past.

### **Lesson No. 1: The language lab: training is an ongoing process**

It is not uncommon for training to be given a low priority. This is true both of the business and of the education sector. There is a prevailing myth that once someone has been on a training course they need never go on another one. We all know this is nonsense, but unfortunately this cuts little ice with the accountants, who are only too aware that the training budget is one of the easiest to cut. There is also a naive belief that sending a language teacher on a general training course in the use of computers is sufficient. This is nonsense. Training must be an ongoing process, and language teachers need properly tailored courses.

Here we can learn a lot from the past. Lack of training sounded the death-knell of the language lab. I belong to the generation that was trained in the early 1960s, when the reel-to-reel tape recorder and the film strip projector were the main technological aids that the language teacher used - if at all - and the language lab was the latest form of technology the new generation might expect to use - which we got quite excited about. The 1960s and 1970s saw a rapid growth in language labs, bolstered by the then fashionable audiolingual approach to language teaching, followed by a rapid decline. Why the growth and why the decline?

(i) Reasons for the growth of the language lab:

- Belief in technology as the panacea
- Belief in "control"

(ii) Reasons for the decline of the language lab:

- Technology failed to deliver what was expected
- "Control" went out of fashion
- Unreliable
- Not user-friendly
- The "battery chicken syndrome"
- Lack of training: operation
- Lack of training: methodology
- Lack of materials
- Lack of time
- Lack of ideas

These are important points that should serve as lessons for the future, and I shall return to them later.

As the language lab declined in popularity, microcomputers began to gain wider penetration into the education sector. At last schools could afford them, but there was already an inherent danger that the microcomputer would go the same way as the technology that preceded it. This problem was addressed in the UK by CILT, the Centre for Information on Language Teaching and Research. In 1982, CILT organised its first workshop on computing for language teachers at St Martin's College, Lancaster, and in the same year commissioned John Higgins and myself to write an introductory booklet on the use of computers in language learning ([Davies & Higgins 1982](#)). I shall continually refer to this booklet, as both John Higgins and I identified many needs and trends that represent a yardstick against which the current situation can be measured.

CILT's 1982 workshop was a successful event, and regular workshops training course organised by CILT have continued to take place since that time, keeping pace with the ever-changing face of ICT and the Modern Foreign Languages curriculum. At a European level, the Council of Europe's New Style Workshops in the 1990s were an important step in the right direction. In these workshops, participants from all over Europe were offered a mixed programme consisting of lectures, software presentations, show-and-tell sessions and, importantly, a large amount of time devoted to group work. More of the same is the recipe for success.

The ingredient missing from the training recipe at present is CALL methodology. One cannot avoid thinking that to a large extent language teachers and teacher trainers have not come to terms with CALL methodology. Is there in fact an emerging CALL methodology? The answer is probably "yes", and a publication by Oxford University Press, based on research carried out by Michael Levy, University of Queensland, Australia, provides some of the answers ([Levy 1997](#)). Training in CALL methodology will help us avoid some of the mistakes of the past.

## Author's update 2009

Levy's book has become virtually a standard reference work since this article was written. Levy echoes my own views:

I believe the CALL community needs to build upon what has gone before, rather than be led purely by the capabilities of the latest technological innovation. With the almost monthly appearance of new hardware and software there can be a tendency for those interested in CALL materials development simply to pick up the latest machine or technological option and get to work on a project. If the technology has not been widely distributed, it is rather too easy to impress. Moreover, past work and valuable experience can be ignored or overlooked. It is usual, when commencing research in other fields, to review and extend the work of others, but with CALL the approach can sometimes be a little more cavalier. Over the last three decades, a substantial number of CALL programs have been created. The concepts and principles underpinning the best of these programs do not necessarily become obsolete when the computer that is used to run them is retired. In fact, the valuable knowledge and experience that has accumulated through this work needs to be absorbed and used to inform new projects in the future. ([Levy \(1997:xi\)](#))

See also [Module 2.1, Integrating ICT into language teaching](#), at the ICT for Language Teachers website and [Davies \(2003\)](#).

### Lesson No. 2: Technology is not the panacea

Although it can be clearly demonstrated that technology alone has cured few problems in the past, there appears to be a persistent refusal on the part of both administrators and technologists to accept this rather obvious fact. Language teachers are now confronted with a three-pronged attack: from the administrators, from the technologists, and from the guardians of the new technology.

## Author's update 2009

The boom period began in the early 1980s with the advent of the microcomputer, which opened up an exciting new range of learning opportunities for students of languages. The computer was hailed by enthusiasts as the panacea, but after the initial period of euphoria many teachers became disappointed with what the computer appeared to offer. This is a fairly typical sequence of events whenever a new technology becomes available to teachers:

In 1922 Thomas Edison predicted that 'the motion picture is destined to revolutionize our educational system and [...] in a few years it will supplant largely, if not entirely, the use of textbooks.' Twenty-three years later, in 1945, William Levenson, the director of the Cleveland public schools' radio station, claimed that 'the time may come when a portable radio receiver will be as common in the classroom as is the blackboard.' Forty years after that the noted psychologist B.F. Skinner, referring to the first days of his 'teaching machines,' in the late 1950s and early 1960s, wrote, 'I was soon saying that, with the help of teaching machines and programmed instruction, students could learn twice as much in the same time and with the same effort as in a standard classroom.' ([Oppenheimer 1997:45](#))

The cycle began with big promises backed by the technology developers' research. In the classroom, however, teachers never really embraced the new tools, and no significant academic improvement occurred. ([Oppenheimer 1997:45](#))

Oppenheimer's point, "teachers never really embraced the new tools", is significant here. It is not the tools themselves that are important but the ways in which they are *used*. But people still blame the technology rather than the ways in which people use it.

### i. Beware of the administrator

Educational administrators are regularly tempted to replace teachers with technology. The "battery chicken syndrome", to which I referred above in the context of the introduction of the language lab, keeps rearing its head. In the 1960s many educational administrators believed that teaching time could be saved by the battery-farming approach: put the students into the booths, connect them to the headsets, switch on the lab, and in a few weeks they'll be ready for the market. All the teacher had to do was sit at the console and monitor their progress. Inherent in this perception of mass training was the concept of technology as the *panacea*. It didn't work, of course. The students were cut off from one another in the language lab booths in the same way as the unfortunate chickens who spend their short, isolated lives in battery farms. The problem is eloquently dealt with by Sue Otto in a reference to what she calls the "isolative potential of technology" ([Otto 1993:9-10](#)).

The typical administrator's perception of mass education is illustrated by Sue Otto in a significant remark by a Dean of Faculty:

By next fall we want you to have complete multimedia courseware up and running for all five languages. And could you please tell me by how many people I can reduce the language teaching staff once these materials are in place. ([Otto 1993:16](#))

The reader may by now have come to the conclusion that Sue Otto and I are natural-born Luddites. This is not true. Technology in the language classroom has its place; it is a useful support and enhancement but cannot replace human interaction. And technology is not necessarily a cheap solution; in fact it may prove more expensive, especially in the initial investment stages.

Technology can improve the quality of the learning environment by offering the student a variety of stimulating media, and it is essential in a self-access centre. But technology in education can only be effective when both the teachers and the administrators understand

what it is all about, make the right purchasing decisions and embark upon a proper programme of awareness-raising and training. As Sue Otto points out, once the language teachers have been trained they need to educate the administrators ([Otto 1993](#):16-17).

## ii. Beware of the trainspotter

Administrators represent one kind of threat to the language teacher, because they believe that throwing hardware at a problem will save money. The trainspotters of the computer world - also known as "anoraks" or "techies" in some circles - represent a different kind of threat, because of their belief in technology for technology's sake. Trainspotting is a hobby that does not seem to be widespread outside the UK, and my colleagues in Continental Europe often raise their eyebrows when I refer to trainspotters in the context of computing. I have never understood the attraction of this hobby. Essentially, it appears to be an obsession with trains as pieces of machinery. The purpose for which trains were designed, i.e. moving people from A to B, appears to be of minor importance.

One of the ways in which the trainspotter's fascination with technology manifests itself is an obsession with gimmicks and a desire to make use of them regardless of their pedagogical relevance. For example, most computers in the early 1980s were incapable of producing high-quality, unambiguous images, but this did not prevent programmers from introducing graphics into their programs at every opportunity ([Davies & Higgins 1982](#):19, [Davies & Higgins 1985](#):35-36). Graphics are of course much better now, and the reproduction of a full-colour photograph on a modern computer is not a problem, but we can see the same old mistake being made with motion video. Most multimedia PCs in educational institutions are still incapable of running video at an acceptable speed of at least 25 frames per second, i.e. the speed at which lip synchronisation with the soundtrack looks right, but I have seen numerous examples of talking heads, with the lips and facial gestures poorly synchronised with the sound, that bring few benefits.

### Author's update 2009

The above paragraph was true at the time that the original version of this article was written in 1996. All modern computers can handle video adequately. The important point is that the technologists were pushing teachers into using video on computers before they were capable of performing as well as older, established technologies, e.g. broadcast TV, videocassette recorders and interactive videodisc players.

In the mid-1990s CD-ROMs could be considered examples of *disruptive technology* or *disruptive innovation*, terms that appear in [Christensen \(1997\)](#) and [Christensen & Raynor \(2003\)](#). A disruptive technology is a technological innovation, product or service that eventually overturns the existing dominant technology in the market even though it may initially perform worse than its predecessors and cause a great deal of inconvenience in the course of adopting it. See also [http://en.wikipedia.org/wiki/Disruptive\\_technology](http://en.wikipedia.org/wiki/Disruptive_technology)

Ironically, the appearance of the multimedia PC caused designers of CALL programs incorporating motion video to take a step backwards, as interactive video (IV) systems were well developed as long ago as the early 1980s ([Davies & Higgins 1982](#):23-24). This is a typical case of new technology driving the pedagogy. The older IV systems consisted of a computer linked to a Philips-compatible 12-inch laserdisc player, and they offered high-quality, full-motion video that was ideally suited to CALL. During the 1980s many interactive videodiscs were produced, for example *Expodisc* and the *Connections* series ([Davies 1991](#)). Such packages allowed the user to switch subtitles on and off at will and participate in dialogues, even recording his/her own voice and matching it with a native speaker model. Unfortunately, this combination of hardware did not prove popular and the consequence is that interactive videodiscs did not reach the wider audience that they deserved. Nevertheless, interactive videodiscs are still being produced for this outdated hardware combination. As for the future, we have to wait for multimedia PCs with faster video interfaces, e.g. MPEG, in order to get back to the standards we came to expect in the 1980s.

### Author's update 2009

Faster video has in the meantime arrived. DVD has caught up with and surpassed interactive video. Interactive videodiscs have virtually disappeared. See [Module 2.2, Introduction to multimedia CALL](#), at the ICT for Language Teachers website.

Speech synthesis is another example of the inappropriate use of technology. Few language teachers were impressed by the synthetic voices that were introduced into CALL programs in the 1980s. The demand for authenticity was too well established, and language teachers could not be persuaded that a voice sounding like a robot was a good model to imitate ([Davies & Higgins 1982](#):55-56). At the time it was not easy to produce authentic speech on a computer. Various devices that attempted to link computers with tape recorders were too cumbersome to be practical (*ibid.*), and synthetic voices were used as a convenient, though inappropriate, solution. Nowadays all multimedia computers are capable of producing high-quality authentic digitised speech, and I thought that speech synthesis - although now much improved - was unlikely to raise its head again in the context of CALL. I was wrong: in 1994 I found a synthetic voice being used in a pronouncing dictionary that formed part of a CD-ROM for learners of English as a Foreign Language.

### Author's update 2009

Things have definitely moved on since 1996. The synthetic female voice produced by my in-car satnav device sounds very real - and quite sexy at times - but "she" tends to make a mess of unusual and foreign place-names. There are many dictionaries available now in which a synthetic voice pronouncing individual words is virtually indistinguishable from a real voice. Synthetic speech does, however, tend to sound false when phrases and sentences are pronounced. Intonation is the key problem area - but it is getting better.

Automatic Speech Recognition (ASR) is another contentious area of CALL. ASR is now being integrated into many CALL programs, two of which I have listed at the end of this article. I have been favourably impressed by some ASR software, but it is still primitive compared with the human ear. The teacher is by far the better judge of the acceptability of pronunciation, and what is wrong with training the student to listen to his/her own voice and to make his/her own judgements? It appears that ASR is favoured most by those who believe

in control.

### Author's update 2009

I was a little bit harsh on ASR in 1996. It's moved on rapidly in the meantime. See [Section 3.4.7 of Module 2.2, Introduction to multimedia CALL](#), at the [ICT for Language Teachers website](#).

Finally, let us consider the graphical user interface (GUI) as found on the Apple Mac and in Windows on the PC. There is little doubt that GUIs have made life much easier for computer users. Few people would disagree that pointing and clicking with a mouse is a major improvement on having to memorise very unmemorable DOS commands. But what we have seen in recent years is a veritable explosion of CALL programs in which all the learner has to do is "point and click and move on quick", often with the minimum of mental processing. For example, I managed to work my way through the first part of a program for learners of Japanese without understanding a word of the language. Keyboard input and discrete feedback have been abandoned, and interactivity is reduced to a selection from choices. In other words, many CALL programs have turned into true/false and multiple-choice exercises - a "very active way of being passive", as a young language teacher was heard to remark at a conference where a new CD-ROM was being presented. I have always been under the impression that part of the process of learning a language involves committing to memory totally unmemorable foreign words and phrases - in suitable contexts, of course - and I find it curious that few modern CALL programs test the learner's ability to demonstrate his/her ability to recall what he/she has learned, either in written or spoken form.

### iii. The Empire Strikes Back

A consequence of the advent of the microcomputer in the early 1980s was that computer users' control of their destiny was wrested from the men (rarely women) in white coats who ran mainframe computing centres. But this process of devolution of power to the people was short-lived. The men in white coats, now accompanied by more women in similar attire, reappeared, this time in the guise of local area network managers. The local area network (LAN) is popular with administrators because it is perceived as a means of saving money, e.g. it is possible to negotiate low-cost network licences for commonly used software. There is no doubt that LANs have their advantages. They overcome the problems - and costs - of issuing dozens of floppy disks to clumsy students, but running a LAN requires a high level of training and a lot of time, and this fact is rarely appreciated by the administrators. As a result, LAN managers are often teachers who have been on a one-day training course and only know the basic network commands without any theoretical knowledge of the concepts. A good LAN manager is indispensable, but too many lack the knowledge to run a network efficiently. And those who do have the knowledge all too often adopt a gatekeeper mentality when anyone encroaches on their territory and dares to suggest that network technology is not the panacea it is perceived to be. For example, LANs demonstrate major shortcomings in handling CD-ROMs. The key problem has been succinctly summarised by [Eastment \(1994\)](#):

It is difficult to see how CD-ROM could be used effectively in a conventional Computer Room. Networking CD-ROMs is fine for simple text. But sending video and audio information around the net so that it finishes up perfectly synchronised at each user's workstation is fraught with difficulties. The alternative is to set up each of the student stations as multimedia machines with their own CD-ROM drives, and provide each station with the CD-ROM discs it needs. It is problematic enough working like this from floppy disk, where at least you can copy the information on to multiple copies and keep your master safe.

Working with CD means that every single workstation would have to have its own original CD-ROM disc in place. Frankly, I cannot imagine many schools going down this path. Soon, perhaps, the technical problems will be solved, or new software will emerge which will prove more 'classroom-friendly'. For the moment, however, CD-ROM is likely to be confined either to individuals or to small groups at a single PC. ([Eastment 1994:75](#))

My own experience supports this view. In the course of 1994-95 I was invited by 20 different educational institutions in the UK and in Continental Europe to give presentations on the use of CD-ROMs in language learning and teaching. Out of the 20 institutions that I visited, only two were able to supply me immediately with hardware that had been set up correctly. A recurrent problem was that LAN managers were unaware that many CALL programs on CD-ROM make extensive use of the playback and recording of sound in combination with elaborate graphics, e.g. the role-plays in the program [TriplePlay Plus](#), which I describe at the end of this article. Such programs do not work successfully on LANs - at least not on the type of LANs that are installed in most educational institutions. Fortunately, for all but one of my presentations I was able to find stand-alone multimedia PCs that could be persuaded to work - after considerable intervention by local technicians.

So what is the solution? [Eastment \(1994\)](#) provides one possible answer: each networked workstation has to have its own CD-ROM drive, and I know of several universities that have recognised that this configuration is a viable solution. The bonus in adopting this approach is that each workstation can then double as an audio CD player - an enormous advantage now that many language courses are available on audio CD. But this is a luxury most educational institutions cannot afford. The result is that the only CD-ROM software that will work efficiently on LANs in most educational institutions lacks the kind of interactivity that language teachers have come to expect. The message that I continually receive from language teachers is one of frustration at not being able to use up-to-date software because of a decision having been made to "network everything".

### Author's update 2009

This is one area where major improvements have taken place. [Eastment \(1994\)](#) was right in assuming that buying CD-ROMs in bulk, so that one could be provided for each workstation, would not be acceptable. LANs are now capable of delivering media-rich multimedia materials to numerous workstations. CD-ROMs are still relatively slow, however, and the usual solution is to transfer their contents to a central hard disk - hard disk access being much faster. The main problem now appears to lie with network managers - who are much better trained than they used to be, but many of them still fail to appreciate that language teachers need to make extensive use of audio

playback and recording facilities and who often fail (or refuse) to set up networks properly to cope with their demands for media-rich learning materials. The [Appendix](#) describes my negative experiences in running a workshop in a European university in 2000. Many schools that I visited as a trainer in 2003 were still unable to make use of multimedia for a variety of reasons: lack of appropriate hardware, lack of headphones and microphones, lack of plug-ins and, in many cases, lack of a properly trained network manager. Things are getting better, but more slowly than expected. As for the issue of the **gatekeeper mentality** that I wrote about in 1996, this is now evident in the management of **virtual learning environments (VLEs)** - also known as **learning platforms** and a variety of other fancy names. See [below](#).

### **Lesson No. 3: Don't back the wrong horse**

In 1982 I wrote:

Generally speaking, it is a good idea to choose a popular established microcomputer rather than a very new or obscure machine. There are two sound reasons for doing so: First, an extensive range of software is likely to be available for a machine which has been around for a while. Second, the more widely known the machine, the easier it will be to obtain advice on using it and to get it serviced. ([Davies & Higgins 1982:51](#))

It is surprising how many people ignore this advice. Making a new hardware purchase can be an expensive gamble. The past is littered with dead hardware. In the 1960s and 1970s we had reel-to-reel audio tapes, eight-track cassettes, single-spool Philips cassettes and dual-spool Philips cassettes. Eventually, the dual-spool Philips cassette won the race, and this is probably the only type of audiocassette with which young people are familiar. A similar race between Betamax and VHS videocassettes took place. Betamax was better than VHS but it came in second. Similarly, the first Apple Mac was unquestionably a superior machine compared to the early PC, but PCs now outnumber Apple Macs by an enormous margin.

#### **Author's update 2009**

Apple Macs are still doing well in the print and graphic design industry and the digital audio/video recording industry. They are unquestionably more sophisticated machines, easier to use and to manage, but PCs now rule the world.

The unstable state of hardware presents users of CALL packages with difficult choices, but designers face a nightmare scenario. On the one hand, they wish to produce packages which are both pedagogically sound and make the best use of new technology. On the other hand, the technology which suits their needs will not necessarily become widely available, and they will then be deprived of a market for their products. For example, in the late 1970s the first *CLEF* programs were written for learners of French ([Holmes & Kidd 1980](#)). The designers wished to avoid reproducing a textbook on screen and they were committed to the use of colour, animation and graphics, which they felt made better use of the computer's facilities. The only microcomputer that could cope with their demands at the time was the CompuColor. The programs looked good on this machine and were ahead of their time in both concept and design, but it was the wrong hardware choice. The CompuColor did not sell, and the *CLEF* programs had to be rewritten for a series of machines: the Commodore PET, the Commodore 64 and the first IBM-compatible PC. A lot of effort was therefore wasted. Similarly, those of us who were committed to incorporating sound into our programs struggled with hardware such as Tandberg's AECAL system ([Davies & Higgins 1982:55-56](#), [Davies & Higgins 1985:33, 92](#)). Our efforts were also in vain, as such systems were short-lived. As I have already indicated in the previous section ([Lesson No. 2](#)), IV systems based on the Philips laserdisc player did not prove popular, even though the quality of the motion video that 12-inch videodiscs offered was first-rate, and certainly superior to what is found today on most CD-ROMs.

So what is the solution? The answer is to be patient, assess which way the market is moving and focus on the hardware most people in your sector are using. CDI systems have been publicised widely over the last few years, and the quality of the motion video such systems offer is impressive. I remain cautious, however, as I have not noticed language centres rushing out to buy CDI equipment.

#### **Author's update 2009**

CDI failed to make an impact, just as I predicted in 1996. DVD won the race.

Once you have made the choice of hardware, you then have to choose the software. The operating system will probably have been pre-installed, but decisions on applications software will have to be made, and at a later stage upgrades will have to be considered. This is a minefield I do not propose to enter. I shall limit myself to one observation:

The educational sector is slow to replace hardware, and computers over five years old are common in both schools and universities. It is also quite likely that the department that gets the new hardware is a computer unit or IT department, which then dumps its obsolete machines on the unfortunate languages departments. CALL software developers are aware of this fact and therefore do not rush to produce software that will run on the latest equipment. Two CALL software producers and retailers, Camsoft and Wida Software, report that DOS programs are still outselling Windows programs both in the UK and abroad.

#### **Author's update 2009**

DOS programs have almost entirely disappeared. Only a few people hang on to old DOS programs that have not been reversioned for Windows. New hardware usually appears in advance of new software, however, and updated versions of software, especially for Modern Foreign Languages, are often slow to appear. My doctor's surgery still uses a DOS program for patients's records, which I find a bit worrying in some ways, but I suppose it's a case of "if it ain't broke don't mend it".

#### Lesson No. 4: A little bit of control is enough

I have already referred to the question of control: the belief in control as a general principle, the teacher at the control console in the language lab, and the LAN manager controlling the network server. I addressed the issue of the computer controlling the learner in 1992, in an article I wrote for language trainers in the business sector:

A business trainee is sitting at a computer following a language course. Step-by-step, the computer presents the essential vocabulary and structures. These are accompanied, where appropriate, by still and animated graphic images, photographs and video recordings. As new words and phrases are introduced, authentic male and female voices pronounce them and the learner repeats them. The learner's voice is recorded by the computer and played back. Any errors in pronunciation are indicated graphically on screen. Offending syllables are highlighted and additional practice is offered on sounds which the learner finds difficult. At the end of each presentation sequence, the computer tests the learner's grasp of the new vocabulary and structures, marking and recording those words and phrases which have been imperfectly recalled and offering feedback on points of grammar that the learner appears to have misunderstood. The learner has access at all times to an online dictionary, a reference grammar and verb conjugation tables. At the end of the work session the learner's progress is recorded by the computer, which enables the thread to be picked up at the next session. In addition, the learner's progress records - along with those of all the other trainees following the same course - can be accessed at any time by the training manager. ([Davies 1992:112](#))

To some people this scenario is utopian, and to others it is a vision of hell. I suspected that business training managers might perceive it as utopian, but I was wrong: so far they have shown little interest in CALL in any form. My own position is suggested in the title to this section.

I was trained as a teacher when the audiolingual approach was in vogue and three-phase drills in the language lab were considered the best way for students to get their tongues round unfamiliar sounds and to fix sentence patterns in their heads. In other words, the approach was predominantly behaviouristic, with the teacher sitting firmly in control at the language lab console. This approach owed much to programmed learning.

Early CALL programs also owed much to programmed learning. I confess to having been initially fascinated by the idea of the computer reacting to the learner's input and branching accordingly, and I admit to having written many CALL routines that were unquestionably behaviouristic ([Davies & Higgins 1982:8ff.](#)). Many of the pioneers in CALL started that way, only gradually discovering that the computer lent itself to different approaches. The early PLATO programs were based on a programmed learning approach, which appealed to some educators. In 1982 I attended the South African Congress on Computers in Education at the University of Stellenbosch. The Control Data Corporation was very much in evidence at this conference, making considerable efforts to establish its mainframe PLATO system in the coloured and black universities. The white administrators thought it was a good idea, as it appeared to solve the problem of teacher shortages and also enabled them to control the educational process. The venture was not a major success, and I recall the report of a teacher trainer in KwaZulu who completely lost faith in the system when it refused to allow a learner of English as a Foreign Language to progress further in a program because she had not reached the required level in a summative test - having made a two-hour journey by bus to the local college where the PLATO terminal was installed and having worked on the program for less than half an hour!

In the scenario I described at the beginning of this section, the machine is controlling the learning process. In this scenario I have created an imaginary "intelligent" CALL (ICALL) package - at least I think it is imaginary. ICALL leans heavily on techniques developed by specialists in Artificial Intelligence (AI), a term I have always considered to be a perfect example of an oxymoron. AI techniques have attracted a good deal of attention in CALL, but they have also come in for severe criticism.

Alan Turing was one of the first computer scientists to set up a yardstick for measuring machine intelligence: the famous "Turing Test", which hinges on the ability of the computer, or rather the set of instructions with which it has been programmed, to convince a person communicating with it via a remote terminal that it is a human being and not a machine ([Turing 1964](#), [Davies & Higgins 1982:28](#)). The thinking machine is a nice idea, but the Turing Test is not necessarily a measure of intelligence. The American philosopher John Searle attacked this idea in his articles on the "Chinese Room" ([Searle 1980](#), [Searle 1982](#)). Searle's Chinese Room represents the computer. A human being may ask the Chinese Room questions in Chinese by posting them into the room in written form. The Chinese Room appears to understand Chinese as it is able to deliver written answers to the questions. What is happening, however, is that there is an operator inside the room who identifies each character in a dictionary and checks the rules of grammar and usage in order to ascertain the meaning of the question. He then assembles an answer, again by checking his dictionary and the rules of grammar and usage. He does not, however, understand Chinese; he is simply manipulating symbols according to a set of elaborate rules. In a BBC *Horizon* program, *Thinking*, first broadcast in 1987, Searle once more attacked the idea of rule-based skills:

If my dog can catch a ball that's bounced off the wall, that may be just a skill he's acquired. The alternative view (*the pro-AI view*) would say: 'Look, if the dog can catch the ball it can only be because he knows the rule: go to the point where the angle of incidence equals the angle of reflection in a plane where the flatness of the trajectory is a function of the impact velocity divided by the coefficient of friction' - or something like that. Now, it seems to me unreasonable to think that my dog really *knows* that. It seems to me more reasonable to suppose he just learns how to look for where the ball is going to and jumps *there*. And a lot of our behaviour is like that as well. We've acquired a lot of skills, but we don't have to suppose that, in order to acquire these skills, the skills have got to be based on our mastery of some complex intellectual structure. For an awful lot of things, we just *do* it.

Searle's articles on the Chinese Room attracted a large number of responses by supporters of AI, e.g. [Harnad \(1989\)](#), but I am not

aware of a completely satisfactory answer to his criticism, particularly of what he calls "Strong AI", i.e. the idea that the human brain is just a set of electrons firing in different directions and that we only need to model this process in a computer program in order to produce an intelligent machine.

The key problem in programming a computer with the rules of natural language is that linguists do not fully understand the rules themselves, so they cannot give adequate instructions to computer programmers. As Searle says, "we just *do* it". It is clear to me that over the last 20 years AI has failed to make a major breakthrough in natural language processing. One only has to look at modern commercial grammar checkers and machine translation programs to see how much work still needs to be done. Research conducted into the effectiveness of a well-known grammar checker by one of my students, Yu Hong Wei, revealed an alarming number of examples of incorrect advice. The texts in square brackets in the following two examples were the grammar checker's reactions to the sentences in italics:

(i) *I just remember how excited I was.*

[The subject pronoun "I" shouldn't be in the object position.]

(ii) *The government should work towards making parents aware about how to keep track of their children.*

[The adjective "aware" should come before the noun phrase "parents".]

A commercial machine translation program that promised "fast understandable translations" produced the following gems:

(i) "Defiance intensively efforts are it to the UN up to now not felicitous, to move the war-parties to a lengthening of the agreement."

(ii) "Survey becomes loudly the authorities of 62 more people."

Given the context of the first example, an article on the war in Bosnia, I was able to work out what this nonsense probably meant, but I had to go back to the source to reassure myself:

(i) *Trotz intensiver Bemühungen ist es der UNO bislang nicht gelungen, die Kriegsparteien zu einer Verlängerung des Abkommens zu bewegen.*

"In spite of intensive efforts, the United Nations have not succeeded in persuading the warring factions to extend their agreement."

I was fooled totally by the second example, but a quick examination of the source revealed all:

(ii) *Vermißt werden laut den Behörden noch 62 Menschen.*

"According to the authorities, 62 people are still missing."

One wonders whether accountants would be prepared to accept a similar lack of accuracy in a spreadsheet package.

Attempts to write CALL programs that can parse the learner's inputs at the keyboard and indicate whether the learner has constructed grammatically and semantically correct sentences have also failed. Programs that purport to be AI-based often turn out to be simple examples of programmed learning that check the student's responses against a set of acceptable answers and anticipated errors, offering appropriate feedback and branching accordingly - which may not necessarily be a bad thing if it is done well. The success or failure of this approach depends on the overall program design. The modern approach stresses the importance of *guidance* rather than *control*, offering the student a default route through the program as an alternative to browsing, and building in intrinsic rather than extrinsic feedback, so that the learner has a chance to identify his/her own mistakes ([Laurillard 1993](#)).

To come back to the scenario I described at the beginning of this section, the most worrying aspect of AI is the element of control that its supporters apparently wish to build into their programs. I shall leave the last word in this section to Rex Last, one of the pioneers in CALL, who devoted a whole book to AI in language learning, changing his mind in the process and coming to a very pessimistic conclusion:

In going down this dangerous path, it seems to me that we are indeed seeking to marginalise humanity and create a race of computerised monsters which, when the power of decision-making is given into their hands, will decree that the human race, with its passions, inconsistencies, foibles and frailties, should be declared redundant, and that the intelligent machine shall inherit the earth. And that, fundamentally, is why my initial enthusiasm has now turned so sour. ([Last 1989:153](#))

## Author's update 2009

I was probably a bit harsh on Artificial Intelligence in 1996. [Last \(1989\)](#) was undoubtedly harsh but it needed to be said at the time, as outrageous claims were being made by AI researchers. Intelligent CALL (ICALL) programs are improving. Parsers are improving. [See Schulze, Hamel & Thompson \(1999\)](#). See also [Module 3.5, Human Language Technologies](#), at the ICT for Language Teachers website for information on current developments.

## Lesson No. 5: Ideas are paramount

One of the reasons for the decline of the language lab that I indicated above ([Lesson No. 1](#)) was the lack of ideas. During the 1980s, however, the language lab was given a new lease of life. This was partly due to improved reliability, more user-friendly controls, more imaginative materials and improved lab design that got away from the battery-chicken-farm appearance of rows of booths. At the same time, self-access was coming into fashion and there was a wealth of new ideas on using the lab: pair work, group work, role-play,

communication games, etc. ([Ely 1984](#)).

There has always been a danger that a lack of ideas might kill CALL. The problem lies not so much in the lack of imaginative programs, more in teachers' attitudes to CALL. [Jones \(1986\)](#) summarised the problem as follows:

Language-learning computer programs, to a much greater extent than language-learning materials on paper, are expected to stand or fall on their own merits, without consideration of their role in a classroom lesson. ([Jones 1986](#):171)

Whereas the teacher and the textbook, or the teacher and the cassette recorder, are regarded as classroom allies, the computer and teacher have generally been seen more as rivals. ([Jones 1986](#):171)

Such attitudes are probably due to the fact that teachers perceive the computer as controlling events in the language classroom or in the self-access room. No computer program stands or falls on its own merits, no more than any coursebook or audiocassette. All too often I have observed teachers dismissing a program as "rubbish", without giving the slightest consideration as to where it might fit into their classroom activities or as part of a guided self-access scheme. Most teachers can probably benefit from Jones' advice, which is just as valid today as it was ten years ago:

- Try it and see what happens. Don't pre-judge.
- Don't expect the program to do all the work.
- If things don't work out, don't automatically blame the program. The problem may lie elsewhere.
- Above all, use your imagination. ([Jones 1986](#):178)

A good example of the imaginative use of a program - or type of program - is a technique which has come to be known as data-driven learning (DDL). The type of program to which I am referring is the concordance package - or concordancer. Concordances were originally used by linguistic and literary researchers, and in the old days these were compiled manually. It used to be possible to be awarded a Master's Degree by compiling a concordance of an author's works, but this would not be allowed today as computers can do the work in a matter of hours.

The use of concordancing packages ties in with the concept of the lexical syllabus ([Willis 1990](#)). Tim Johns was one of the first teachers I saw making use of a concordancer in language teaching, using a package which he had written on a tiny Sinclair ZX81 computer in the early 1980s. This embryonic program went through several stages of development, eventually being published some ten years later by Oxford University Press as *MicroConcord*, a concordancer designed for language teachers that includes a good selection of optional text corpora. There are numerous ways in which the teacher can use a concordancer in the language classroom, for example:

- The teacher can use the concordancer to find examples of authentic usage to demonstrate a point of grammar, typical collocations, etc.
- The teacher can generate exercises based on examples drawn from a variety of corpora.
- Students can work out rules of grammar and usage for themselves by searching for key words in context.
- Students are encouraged to be sceptical about explicit rules.

More examples and a wealth of ideas are described by [Tribble & Jones \(1990\)](#), [Johns \(1991\)](#) and [Johns & King \(1991\)](#).

### Author's update 2009

Sadly, Tim Johns passed away in 2009. More information on concordancing can be found in [Module 2.4, Using concordance programs in the Modern Foreign Languages classroom](#), at the [ICT for Language Teachers website](#).

New ideas in CALL are slow to emerge but, as Nina Garrett points out, the computer offers us an excellent opportunity to "challenge the limitations of current pedagogy, the prescriptions, proscriptions, priorities, and a priori assumptions which up-to-date teachers accept as given" ([Garrett 1991](#):17). The fact is that we don't know what goes on inside language learners' heads but, by tracking how learners behave - which is easily done, and is in fact being done at this moment by Vance Stevens, one of my research students - we might have a better understanding of the effectiveness of CALL activities and which learning strategies are desirable.

### Lesson No. 6: Doing it yourself is not the answer

Writing your own materials sounds like a good idea, but few language teachers have the time to do so. When I embarked upon my career as a language technologist in the 1970s, I grappled with three programming languages: FORTRAN, SNOBOL and BASIC. When I got to grips with BASIC I was able to write a number of simple question-answer routines on Ealing College's minicomputer. I found programming each new routine tedious, however, and decided to speed up the process by writing an authoring facility. The complete package, which included both the teacher's and the student's programs, was published by Wida Software in 1981 as *Teacher's Toolkit*. The package was developed further and published by Hutchinson in 1982 under a new name: *Questionmaster* ([Davies & Higgins 1985](#):64-66). *Questionmaster* was a simple tool, requiring the teacher to type in a question, a series of acceptable alternative answers and a hint to help the student to get on the right track. It soon became obvious, however, that teachers found this simple process too time-consuming, and there was a clear demand for ready-made materials to accompany the authoring package. The outcome was the production of *Apfeldeutsch*, which was created with *Questionmaster* and published by Wida Software in 1981. The demand for ready-made materials to accompany authoring packages is just as strong today as it was in the early 1980s, which accounts for the continuing popularity of Wida Software's *CALL for English* series and Camsoft's series of titles that tie in with Mary Glasgow's and Thomas Nelson's French, German and Spanish coursebooks.

The do-it-yourself approach to CALL software creation has rarely worked. Only those with hours of dedication at their disposal have made a success of it. The past is littered with dead authoring packages: *TES/T*, *Pilot*, *Microtext*, *TenCore*, etc. BASIC was simply too difficult for most language teachers. I was wrong to suggest that linguists might wish to become programmers ([Davies & Higgins 1982:45](#)) and foolish enough to devote a whole textbook to programming for users of language ([Davies 1985](#)) - which was not a bestseller. I still believe, however, that linguists who need to communicate with programmers ought to understand the way programs work. In 1982 I wrote: "The elegant solution to software creation is collaboration between linguists and programmers." ([Davies & Higgins 1982:44](#)). I have no reason to change my mind, and I firmly believe the best CALL software development team consists of two people: a linguist who understands something about programming and a programmer who understands something about language.

### Author's update 2009

Many language teachers have found the time to develop their own materials using common tools such as Microsoft *Word* and *PowerPoint* and a variety of new authoring packages, but most teachers are surprised by the time that it takes, especially to develop materials incorporating multimedia. Ready-made materials therefore continue to be popular. In view of recent developments in screen design and instructional design, a graphic designer and instructional designer need to be added to a software development team. See these two modules at the ICT for Language Teachers website:

- [Module 2.5, Introduction to CALL authoring programs](#)
- [Module 3.2, CALL software design and implementation](#)

There are two authoring programs which are enjoying continuing success today after a very long run: *Fun with Texts* (first published by Camsoft in 1985) and *Storyboard* (first published by Wida Software in 1982). Both enable the generation of total-text reconstruction exercises. Why have they lasted so long? One reason is that these programs generate the maximum of student activity with the minimum of effort on the part of the teacher: all the teacher has to do is find a text, type it - or copy and paste it if it already exists in electronic format - and store it on disk. The text then forms the basis of an activity that will keep the student busy for at least half an hour - or longer in the case of *Fun with Texts*, which generates seven different text-reconstruction exercises from one text. It was established by Sue Hewer, who based part of her (unpublished) MPhil thesis on a study of *CopyWrite*, a forerunner to *Fun with Texts*, that in a 30-minute session at the keyboard an average number of 128 input attempts took place when a group of three students collaborated on a total-text reconstruction exercise. Her research also established that an average number of 64.5 "strategy events" (i.e. group decision-making processes while handling the inputs) took place. So the students were kept active, and a significant amount of discussion, negotiation and mental processing took place. Both Camsoft and Wida Software report that these two programs are still their bestsellers. It has been suggested that another reason for the popularity of these programs is that they appeal to LAN managers, because they run under DOS and are therefore easy to set up, and - unlike some Windows programs - cannot easily be tampered with by students.

Some authoring packages are useful for presentations and creating simple point-and-click routines, e.g. *Toolbook*, and these are fairly easy to learn. Others, e.g. *Authorware* and *Director*, are far too difficult for the amateur, and time-consuming even for the professional programmer - I write from bitter experience. What the language teacher needs is a very basic authoring tool that requires the minimum of effort, e.g. my own *GapKit*, which aims to provide a simple solution to multimedia authoring. This package presupposes knowledge only of Windows, in particular the accessories *Write*, *Paintbrush* and *Sound Recorder*.

### Author's update 2009

Camsoft's *Fun with Texts* and Wida's *Storyboard* - now part of *The Authoring Suite* - have been updated for modern versions of Windows and continue to be bestsellers. Both packages now incorporate facilities for integrating texts, images and audio and video recordings into the activities, and they can both be networked. See Sue Hewer's contribution on text manipulation at the ICT for Language Teachers website, [Section 8 of Module 1.4, Introduction to Computer Assisted Language Learning](#)

### Lesson No. 7: The Internet: beware of the hype

I have been using electronic mail (email) for the last ten years. I check my three electronic mailboxes daily and deal with approximately 70 email messages a week.

### Author's update 2009

I now receive on average around 20 emails per day, i.e. emails that I actually want. The rest are spam. On two occasions in the last five years one of my email addresses has been subjected to a spam hijack, whereby it was spoofed as a spammer's return address. This resulted in the address receiving up to 1000 "bounces" and irate emails per hour from recipients of the spam who thought that I was the originator. On the first occasion I had to close the address down for a few weeks until the storm subsided, but on the second occasion I was able to intervene immediately and kill the onslaught by tweaking my ISP's spam-trapping facilities, namely *Spam Assassin* and *Box Trapper*. To help avoid spam I no longer display my email address on the Web, so that the chances of spammers picking it up are reduced. Initial email contact can only be made with me via a [Contact Form](#) at my business website. I now use an efficient spam filter, *MailWasher*, which filters out the junk that gets past my two ISPs' own filters: <http://www.mailwasher.net>. See [Davies \(2004\)](#).

I make extensive use of the Internet and I used it in order to locate some of the sources of information that I have cited in this article. I think it is fair to say that I am experienced user of telematics. In a talk I gave at the London Language Show in October 1995, I made two provocative statements about the Internet:

- i. The Internet is a rich resource of material, accessible to everybody and of immense educational value.
- ii. The Internet is a chaotic collection of material, most of which is junk and accessible only to the 5% of people in the world who

possess a telephone. It is growing too rapidly, currently doubling in size every 55 days. It is impractical to use in an educational context and completely confusing to the novice. It's rather like having the British Library in your study with the prospect of four pantechinons full of books being dumped on your doorstep every day.

The truth is somewhere in between. I shall now attempt to dispel the hype and establish what the language teacher can realistically expect from the Internet, especially the World Wide Web.

### Author's update 2009

The situation has changed enormously since 1996, but there are still millions of people in the world without Internet access, either because their countries are still poor and underdeveloped or for more sinister political reasons. Getting information from the Web, which is expanding at a breathtaking speed, is not always easy, however. Search engines such as Google are a great help but, as Arthur C. Clarke put it, "Getting information from the Internet is like getting a glass of water from the Niagara Falls." Most of the information on the Web can probably still be classified as junk - but there are millions of gems in between. See these two modules at the ICT for Language Teachers website:

- [Module 1.5, Introduction to the Internet](#)
- [Module 2.3, Exploiting World Wide Web resources online and offline](#)

From the early 1980s onwards we saw an explosion in hypertext programs. These appeared first on the Apple Mac and then on the PC. Most reference works on CD-ROM are now based on the hypertext principle. The idea of non-sequential reading, pointing and clicking anywhere on the screen and branching to wherever you like has enormous appeal. I confess to spending hours with CD-ROMs such as *Encarta* and *Cinemania*, both of which incorporate a hypertext approach. Since 1993 we have had access to the World Wide Web (WWW), effectively a world-wide hypertext system that enables the user to branch to any computer anywhere in the world simply by pointing and clicking at a piece of text or a picture. The WWW has enormous appeal, and my telephone bill bears witness to my own addiction to self-indulgent Web-browsing.

### Author's update 2009

My telephone bill has been dramatically reduced, thanks to the introduction of cheap broadband: see [below](#).

The problem with browsing, whether it is in the context of a stand-alone hypertext stack or over the whole of the World Wide Web, is that it is *unstructured*. One learns in different ways, of course, sometimes by following a tightly structured course and sometimes by coming across a piece of interesting information completely by chance. If you have unlimited time, unstructured browsing is a very pleasant way of learning, but most people, especially those following courses in educational institutions, cannot afford to waste too much time on this activity. A certain amount of browsing is to be encouraged, and I firmly believe in allowing the learner to follow his/her own inclinations as far as is possible. Software, however, needs to offer what has become known in CALL jargon as the *default route*. Diana Laurillard puts the argument succinctly, as follows:

A default route is the route through the material that the author believes to be optimal. Completely open-ended program structure can make students anxious - they like to know what they are supposed to do. It must always be possible to deviate from the default route, but it should be clear what it is, so that they can just follow it through. This saves students having to make decisions at every turn, and may also encourage them to consolidate, rather than keep moving on. ([Laurillard 1993:2](#))

In the context of electronic communication, it is important that students know what they are supposed to do. The ELNET computer conferencing project (1989-91), in which I participated as evaluator, was an imaginative experiment in linking together 15 educational institutions in three countries: England, France and Germany ([Davies R. 1992](#)). As a language learning project, it suffered on the whole from a lack of control on the part of the teachers. Students would send one another messages on an ad hoc basis, most of which had little value as authentic language learning material. An "interventionist" approach ([Davies R. 1991:70](#)) was therefore adopted halfway through the project, and this proved more effective, especially in teacher-monitored simulations:

It became apparent at the ELNET Conference in Würzburg, October 1991, that the success of one of the winners of this competition (the *Eurodesk* multilingual business simulation) was clearly due to a very tightly managed series of classroom activities which took place offline while the simulation was running. ([Davies R. 1991:78](#))

The pedagogical argument regarding the balance between structured tasks and unstructured communication and browsing activities comes down heavily in favour of the former in the context of electronic communication, which can be a very expensive medium to maintain if control of the use of the access lines is not carefully monitored.

Most schools access the Internet via a modem and a standard narrowband telephone line. I access the Internet from my own home in this way, using a 14,400 bps modem that connects me with a local service provider. This setup is fine for sending email messages and uploading and downloading text. However, I recently conducted a little experiment in downloading a variety of files:

- i. A compressed reproduction of a colour photograph took three minutes to download.
- ii. A 25-page article took five minutes to download.
- iii. A single spoken sentence took five minutes to download.
- iv. A 2.5MB program took one and a half hours to download. I was able to use this time fruitfully by making a cup of coffee, marking a student's essay, taking my dog for a one-mile walk and watching the evening news broadcast on TV.

At this rate a full CD-ROM would take about two weeks to download!

### Author's update 2009

Big changes have taken place since the advent of broadband on a wide scale. Modems are now a lot quicker than they were in 1996, but those that connect to the Internet via standard telephone lines (dial-up modems) remain infuriatingly slow. My 56Kbps dial-up modem (long since abandoned) never connected faster than 28Kbps via a standard British Telecom line. Downloading large chunks of sound and video is therefore a non-starter for people connected to the Internet via a dial-up modem. But I had to wait until December 2002 until I was able to connect to the Internet via broadband at 500Kbps, using Plusnet's ADSL service: <http://www.plus.net>. It made an enormous difference to my Web browsing, and now my connection has (theoretically) been upgraded to 8Mbps, *but* it usually connects at around 3.5Mbps and I find that if I browse the Web at peak times, e.g. school hours during the day and after 6pm when people come home from work, I often get frustrated by the slow speed of access to some websites. There are many factors that can influence speed: your broadband package itself, your geographical location, how many people in your neighbourhood are online, computer configuration and applications, and even the weather. This why we still need CD-ROMs and DVDs for some kinds of activities, especially those that demand quick interaction. No one has ever tried to sell me a CD-ROM or DVD that I cannot use at certain times of the day or week.

In 1996 I wrote: Universities access the Internet via their own systems, using special broadband lines that operate at a significantly higher speed than standard telephone lines: around 2Mbps or 150 times the speed of my old 14,400bps modem. But real speed of access for everyone will only be possible when we can tap into fibre-optic communications systems, and that depends on individual countries' policies on telecommunications and how quickly the cable companies are able to dig up the roads and put the cables in place.

### Author's update 2009

2Mbps would now be considered slow. They have finished digging up the road outside my house, replacing the antiquated copper cable systems with newer copper cable systems.

There is another snag: download times are dependent on how quickly the server at the other end of the line copes with your demands. I have recently discovered that some slow servers that I have been accessing are not overloaded mainframes, as I thought, but sluggish 386 PCs that have been relegated to the task of handling a single website. Accessing the Internet is rather like driving along the M4 and hitting the traffic jam on the Brentford flyover: it can take 20 minutes to cover the first 25 miles and then half an hour to cover the next 2 miles. If a lot of people wish to access a particular website at once, then a bottleneck ensues. As I have proved to myself in the course of writing this article, the Superhighway turns into a dirt-track after 11.30 am UK time. Congestion in the UK starts soon after 9.00 am and lasts most of the day, but the main congestion occurs as the population of the United States begins to wake up. While trying to download an article from the UK's NCET's website at the peak period of 2.00 pm, I spent 25 fruitless minutes waiting for the server to present me with only 14% of the text. UK schools were obviously very active that day! I gave up and tried again shortly after 6.00 pm (when telephone charges are lower in the UK). This time the NCET's server appeared to be working a bit faster, so I persevered, but it just hiccuped along and the 40Kb 10-page article took a colossal 58 minutes to download. I tried again at 1.30 in the morning. This time the process of accessing the server and downloading the text took a total of five minutes. As I do most of my surfing in the middle of the night I manage to find these quiet spots, but those who work normal hours might have problems. Just out of curiosity, I accessed the same NCET page from one of my university's Internet workstations at 3.30 pm the following day. This time the whole process took barely one minute. Such is the unpredictability of the Internet.

### Author's update 2010

Internet congestion continues to be a problem. I have stopped surfing in the middle of the night! NCET changed its name to BECTA in 2000. BECTA was finally closed down in January 2011.

However, in spite of this gloomy and confusing picture it is fair to say that the World Wide Web offers a wealth of resources - mainly text - that can easily be accessed using basic equipment. The press in various languages is there, and so are encyclopaedias and a host of other reference works. Access does, however, need to be controlled in order to keep the bills to a minimum and to prevent students (and staff) downloading undesirable material. It is a good idea to locate the Internet workstation in a public position, so that passers-by can see what is happening on the screen. For example, one of the Internet workstations in Thames Valley University's Language Centre is located on a table near the issue desk where students enter the main IT area.

### Author's update 2009

Most universities and schools now allow access to the Internet from any workstation on the LAN. Downloading undesirable material continues to be a problem, but software packages that screen out undesirable sites are available. On the other hand, some filters installed in schools are ludicrously over-sensitive, locking the user out from sites containing words such as "Middlesex" and "cocktail" - and it's tough if your address is in Scunthorpe. Spam and viruses are probably the main problem nowadays. See [Davies \(2004\)](#) and these two modules at the ICT for Language Teachers website:

- [Module 1.5, Introduction to the Internet](#)
- [Module 2.3, Exploiting World Wide Web resources online and offline](#)

EFL teachers have access to a vast range of resources, a good selection of which have been documented by [Eastment \(1996\)](#). Teachers of other languages have access to fewer materials, sadly because the language of the Internet is predominantly English, but a search under terms in French, German and Spanish will usually locate the appropriate source - sometimes with surprising results, as Roger Blamire of the UK National Council for Educational Technology (NCET) revealed when he did a search for articles in French on

"Mad Cow Disease" in a live session at Language World 1996, Exeter University. It appeared that the key words "vache folle" may be subject to different interpretations!

### Author's update 2009

I had a similar experience to that of Roger Blamire while running a workshop for teachers of English as a foreign language. One of the teachers, a secondary school teacher from Spain, wanted to find the song lyrics of a Britney Spears song. Unfortunately, Web search engines don't always associate Britney Spears with her musical talents... The range of languages available on the Internet is now huge, with Japanese and Chinese websites proliferating at an enormous rate.

My own selection of useful sites as starting points for links to masses of other sites for teachers and learners of languages is documented at: <http://www.camsoftpartners.co.uk/websites.htm>

See also my two introductory articles:

- i. <http://www.camsoftpartners.co.uk/webintro.htm>
- ii. <http://www.camsoftpartners.co.uk/webcreat.htm>

### Author's update 2009

Critics of the Web lament the disappearance of traditional educational environments, citing the dubious ethics of those who wish to turn our universities into "Digital Diploma Mills" - the title of a five-part series of articles by David Noble ([Noble 1997-2001](#)):

In his classic 1959 study of diploma mills for the American Council on Education, Robert Reid described the typical diploma mill as having the following characteristics: "no classrooms," "faculties are often untrained or nonexistent," and "the officers are unethical self-seekers whose qualifications are no better than their offerings." It is an apt description of the digital diploma mills now in the making. Quality higher education will not disappear entirely, but it will soon become the exclusive preserve of the privileged, available only to children of the rich and the powerful. For the rest of us a dismal new era of higher education has dawned. In ten years, we will look upon the wired remains of our once great democratic higher education system and wonder how we let it happen. That is, unless we decide now not to let it happen. ([Noble: ibid. Part I](#))

Other critics include [Press & Washburn \(2001\)](#). The preamble to their article titled "Digital Diplomas" says it all:

Welcome to the brave new world of higher education, where professors are "content experts," classes are "courseware," and students are customers. But just what is a dot-com degree worth? ([Press & Washburn 2001](#))

Harsh words, but the above authors make some very important points that should not be overlooked in these times of technohype. The Web certainly has its "Dark Side", and evidence is already emerging from North America that online learning may go the same way as some of the early Web businesses that have crashed so spectacularly. Evidence coming out of North America suggests that e-learning courses do not recruit well:

In 1997, facing a projected 50 percent increase in the state's student population over the next decade, Utah governor Mike Leavitt announced the formation of Western Governors University, a cyber-college backed by governors from 19 states that now offers online courses from 40 schools. "We are turning around the old notion that to be educated one had to go somewhere," Leavitt declared in a speech before the U.S. Senate's Commerce, Science, and Transportation Committee. "We are going to bring the knowledge and information to the learner," providing students with a high-quality education "while holding costs in check." By January 2000, Western Governors University had enrolled a mere 200 degree-seeking students. ([Press & Washburn 2001](#))

The British government repeated this mistake, attempting to set up the UK e-University (UKeU) at a cost to the British taxpayer of 62 million pounds. In June 2004 it was announced that UKeU was to be scrapped. Its ambitious plans to attract thousands of overseas students to study online with UK universities failed. It managed to attract just 900 students, at a cost of 44,000 pounds each. Its target was to sign up 5,600 students in the first year. As many universities around the world are discovering, there is less demand for online study than predicted. The potential target audience does not appear to have been carefully considered. Do young people, i.e. those aged 18-25, really want to spend their time following an online course or would they prefer to leave home and enjoy the rich intellectual and social life that a traditional university offers? The ideal target audience of online courses may well prove to be people who are house-bound for various reasons, young professionals aged 25-40 who wish to upgrade their qualifications, and "silver surfers" (retired people with time on their hands).

As for interactive materials on the Web, few lessons appear to have been learned from the past. In [Lesson No. 2](#) I criticised the trend towards a "point-and-click-let's-move-on-quick" approach to CALL. Many so-called interactive exercises on the Web are a lot worse than the exercises contained in early CALL programs. The Web is an excellent *delivery medium*, insofar as it delivers the materials quickly to anyone anywhere in the world. But what happened to all the lessons we learned about input analysis, feedback and branching way back in the 1980s? See [Section 3.6 of Module 1.4, Introduction to Computer Assisted Language Learning](#) at the ICT for Language Teachers website. See also [ICT4LT Module 1.5](#) and [Module 2.3](#), and [Felix \(2001\)](#), [Felix \(2003\)](#).

Finally, the spread of Web-borne viruses has meant that anyone who surfs the Internet on a regular basis has to be continually on the lookout for invasions. See [Davies \(2004\)](#).

## VLEs, blogs, podcasts etc

Right now (2009) **virtual learning environments** (VLEs), along with **blogs, wikis, podcasts, social networking, virtual worlds** and a plethora of other so-called **Web 2.0** applications, are being hailed by the new generation of teachers as the greatest inventions since sliced bread. But these newer manifestations of ICT are only as good as the materials that they contain and the way in which the materials are exploited. Once again, it's the "gee-whiz" factor of the technology that is setting the pace. Teachers need to think about the pedagogy and methodology first. If it looks as if the new technology will enable you to deliver that pedagogy and methodology in a better way, then **experiment!** Try it out!

Haven't we seen all this before? Each new generation appears to believe it has discovered the Holy Grail when a new technology appears. Yes, VLEs, blogs, podcasts, virtual worlds and other Web 2.0 applications are welcome innovations in many respects, but once again it is a question of how teachers *use* them, not the clever technologies that make them possible.

**Moodle** is a VLE (actually referred to as a Course Management System, which is one of a variety of different names used to describe such systems) has quite a strong following among teachers of modern languages: <http://moodle.org>

Recent EUROCALL conferences have also featured Moodle. Look at the EUROCALL conference archives at: <http://www.eurocall-languages.org>

The Open University has introduced Moodle for the delivery of online tuition, including modern foreign languages. Formerly it used its own in-house system, **Lyceum**. It is unlikely, however, that the Open University's modern foreign languages departments intend to deliver their courses 100% online. Moodle, like Lyceum, is considered only as an add-on to the media that the Open University currently uses, e.g. printed materials and recorded audio and video materials, as well as face-to-face tutorials delivered at local colleges. The Open University is a success because of this "blend" and its comprehensive tutor support network. See [Hampel & Hauck \(2004\)](#).

Like all other VLEs, Moodle is still incapable of delivering the one facility that I regard as the sine qua non of language learning, especially in the beginner stages: namely offering interactive exercises in which the learner can record and playback his/her own voice and hear what he/she sounds like. I have been doing this as a language learner since the 1950s and as a language teacher since the 1960s, beginning with the humble reel-to-reel tape recorder and, more recently, using a variety of CD-ROMS and DVD-ROMs that offer this facility. I picked up a bit of Polish with the EuroTalk series of CD-ROMs in anticipation of a visit to Poland in 2005, having searched in vain for anything on the Web that offered me a listen / respond / playback facility that allowed me to practise getting my tongue round those horrendous Polish consonant clusters.

### Conclusion 1: Training and information are vital

#### Author's update 2009

This conclusion is still as valid as ever. See [Davies \(2001\)](#), [Davies \(2002\)](#) and [Davies \(2003\)](#).

I have already referred to the CILT's training workshops and the Council of Europe's New Style Workshops ([Lesson No. 1](#)). It is worth making the point again that training language teachers in specialised workshops and seminars on the use of new technology needs to be an ongoing process. Language teachers are better equipped than other teachers to benefit from international initiatives, on the grounds that they can communicate better with one another and probably have more of an inclination to work in international environments. The European Association for Computer Assisted Language Learning (EUROCALL) has been organising international conferences on CALL since the mid-1980s. More recently, EUROCALL has set up a database of international experts who are prepared to contribute to local workshops anywhere in Europe. Training needs to be backed up by access to relevant sources of information that enable teachers to keep up to date. EUROCALL is the main European organisation that is responsible for the dissemination of information on CALL. This is done electronically, through conferences and through printed publications: <http://www.eurocall-languages.org>

The European Union is also devoting a substantial amount of funding to the promotion of training and development initiatives in new technologies and language learning under a number of different programmes: <http://europa.eu>

### Conclusion 2: CD-ROM is the way ahead

#### Author's update 2009

This section is now very dated. CD-ROMs have been replaced to a large extent by Web-based resources. However, I am still looking for a good Web resource that offers listen / respond / playback facilities, i.e. a "virtual language lab", which is a common feature of offline resources on CD-ROM or DVD. See also the section headed [The Empire Strikes Back](#) in [Lesson 2](#). Information on networking CD-ROMs can be found in [Module 2.2](#), *Introduction to multimedia CALL*, at the ICT for Language Teachers website.

I have made a new attempt to describe the current situation and predict the way ahead in [Davies \(2005 - regularly revised\)](#).

At present it looks as if CD-ROM is the most promising way ahead. In spite of the shortcomings I have indicated regarding the quality of motion video on CD-ROM, I am confident that in the near future these problems will be overcome; in fact they have already been overcome, but the bulk of end-users are still unable to benefit from progress made in recent years. The most important aspect of CD-ROM technology is that it offers high-quality sound, surely the most important development in CALL over the last 20 years. One wonders how we did without it throughout the 70s and most of the 80s. CD-ROM, as opposed to CDI, points to the future. The medium is still finding its feet, however, and it is clear that program designers still have a lot to learn. In the meantime, I will conclude by presenting my

own selection of CD-ROMs, which I consider to be good examples of the use of good pedagogy and appropriate use of CD-ROM technology.

**TriplePlay Plus** (Syracuse Language Systems) offers a game-like approach to language learning. As the title suggests, there are three levels of play, the first concentrating on words, the second on phrases, and the third on conversations. The quality of the sound output is excellent, and the learner can record his/her own voice, choosing different speeds of delivery by the native speaker. There are text-based exercises too, e.g. the rearranging of jumbled sentences. The learner can choose to monitor his/her own playback or switch on the Automatic Speech Recognition software - which works quite well in this package. The topics covered are: Food, Numbers, People, Activities, Places & Transportation, Home & Office. The package is available in English, French, German, Spanish, Italian, Hebrew and Japanese.

**Encounters** (TELL Consortium, published by Hodder & Stoughton) is a series aimed at the adult beginner in French, German, Spanish, Italian or Portuguese. The approach is modular, functional and non-sequential. Each CD-ROM consists of 25 modules covering a variety of functions: e.g. Travel & Tourism, Asking for Directions, Introductions, etc. The student can participate in spoken dialogues, recording his/her own voice and matching it with the native speaker model. It is possible to explore each dialogue in more detail, seeking information on grammar, usage and cultural background. Optional exercises are also available.

**The Tortoise and the Hare** (Brøderbund) is one of the popular *Living Books*, most of which centre on a short story aimed at young children - although adults seem to find them just as entertaining. Aesop's fable of the race between the tortoise and the hare is presented here in a new light. Simon, the storytelling bird, acts as the narrator. The full text of the story appears on screen - in English or Spanish - and is first read out loud by a native speaker (American English or South American Spanish). The learner can click on any word in the text in order to hear it pronounced, but clicking on items in the pictures that illustrate the story brings a rich variety of surprises: chimney pots that wish one another "Good morning" or "Buenos dias", the politically correct tortoise that insists on newspapers being recycled, the rapping beaver - and many others.

**The New Kid on the Block** (Brøderbund) is another *Living Book*, but with a slightly different approach. Instead of dealing with just one story, this CD-ROM contains a series of amusing poems in English for young children, all of which have been written by Jack Prelutsky. The aim is to bring the poems to life. The learner can listen to the whole text of each poem and can then click on any word. A native speaker (American English) reads the individual word out loud and the meaning of the word is acted out in a series of animated cartoons. The animations are both memorable and humorous, proving that poetry can be fun.

**All-in-One Language Fun** (Syracuse Language Systems) offers an introduction to five foreign languages: French, German, Spanish, Japanese and English. The package is aimed at the younger learner (3-12) and concentrates entirely on listening skills through multimedia versions of familiar games: e.g. Jigsaw Puzzles, Memory Teasers, Simon Says, Bingo, Telling the Time, Dress the Child, etc. The package is full of illustrations, some of which are animated. The game in which the learner has to guide the mouse towards the cheese is particularly good for teaching prepositions of location and direction. Adults also seem to enjoy this CD-ROM.

**En Route** (Yorkshire Television & International Thompson) is aimed at secondary school learners of French. It is divided into ten comprehensive sections covering a wide range of everyday topics. Each section deals with a different topic and contains a variety of exercises. The package enables the user to record his/her own voice and compare it with a French native speaker. Students may also measure their progress via continuous assessment. There are hundreds of photographs, illustrations, video and audio clips, and online grammar help. Spanish and German companion CD-ROMs, titled *En Marcha* and *Unterwegs*, are also available.

**Your Way** (Syracuse Language Systems) is a multimedia CD-ROM consisting of a variety of branching conversations. Like Syracuse's other publication *TriplePlay Plus*, this package makes use of speech recognition - which again works quite well. The learner participates in conversations with more than one possible response and more than one outcome, so the conversations branch according to the learner's choices. It's an old idea but executed well in the context of this new medium. The conversations are complemented by a set of interactive games. The package includes a grammar reference section and bilingual glossary. Available in French and Spanish.

**Who is Oscar Lake?** (Language Publications Interactive) is similar in some respects to *Your Way*, the difference being that the learner is playing the key role in a mystery story. As the learner tries to solve the mystery he/she is confronted in the target language with an interesting cast of characters in real-world settings. The learner's mother tongue can be set to English, French, German, Italian or Spanish, making the software usable for a wide variety of different users. The video scenes run under QuickTime. They are a bit jerky but in the context of this CD-ROM they are a vital component for the interactive sequences: e.g. in one sequence the learner books a train ticket, hands the ticket clerk the money, picks up the ticket and puts it in a briefcase. The learner can choose to see the text of any conversation on screen, record his/her own voice, and see a translation. The learner participates in the conversations by selecting alternative answers, so the conversation can develop in different ways - and so can the story. Over 1000 items of vocabulary are covered. All the learner has to do is click on any object in any scene, which causes a native speaker to pronounce the name of the object while the text appears on screen. Available in French, German, Spanish and English from [World of Reading](#).

**Cinemanía** (Microsoft Home) is included here partly because I am a film addict but also because I believe students should give careful thought to the films they choose to watch. This CD-ROM offers the user access to a selection of reference works containing reviews of thousands of films. The reviews are accompanied by biographies, still pictures, famous dialogues (together with transcriptions), musical excerpts and video clips. Yes, the motion video sequences are jerky, but how else does one convey the atmosphere of the remarkable tense scene in which Will Kane (Gary Cooper) waits for the vengeful Frank Miller (Ian MacDonald) to arrive on the 12 o'clock train in *High Noon*, and is there a better way of reminding oneself that Rick (Humphrey Bogart) did not say "Play it again, Sam" to Dooley Wilson in *Casablanca*? He actually said, "Sam, I thought I told you never to play..." before he caught sight of his lost love Ilsa (Ingrid Bergman) in his bar, the Café Americain: an unforgettable moment, captured in multimedia.

**Encarta** (Microsoft Home) is probably the best of the encyclopaedias on CD-ROM. *Encarta* is good example of a comprehensive hypertext system in which the user can browse at will. The text, audio, graphics and video clips are superb, and the user has access to an online dictionary, thesaurus, wordprocessor and atlas. In a recent browsing session, I started with *Wales*, which linked me to an article on the *Celtic Languages*. This took me to a selection of words and phrases in *Irish Gaelic*, which I was able to hear pronounced. Finally, I ended up in the section on *World Languages* and was able to compare ways of saying "Hello" in about 60 different languages, from Albanian to Zulu. I was also able to listen to Dylan Thomas reciting the opening lines of his poem *Do Not Go Gentle into That Good Night* and Robert Frost delivering *Fire and Ice*. The new version of *Encarta* has less of an American bias, and a French language version is in production.

**The Grammar ROM** (Longman) is aimed at learners of English as a Foreign Language. This is one of the few CD-ROMs I have seen that concentrate on grammar. All the key points of English grammar are covered: Verbs, Nouns and Articles, Modals, Conditionals The Passive, Adjectives and Adverbs, Questions, Prepositions, Clauses, Links, Reported Speech, Phrasal Verbs, Gerund and Infinitive. The learner can choose between English, French, German, Spanish and Italian as the language of on-screen instructions and spoken instructions. There is an online glossary and grammar reference section, accompanied by 300 exercises: e.g. multiple-choice and gap-filling exercises, comprehension exercises relating to written text and audio and video recordings, re-ordering of sentences, sequencing of activities. The CD-ROM includes lively cartoon drawings, authentic sound recordings, and motion video sequences taken from videos written by Ingrid Freebairn and Brian Abbs: *A Family Affair*, *Two Days in Summer*, *Face the Music*.

**Longman Interactive English Dictionary** (Longman) goes beyond the normal printed dictionary by offering the learner an extensive computer database consisting of text, sound, video clips and pictures. The *LIED* is based on printed versions of Longman's popular reference works for the student of English. As well as being able to read about grammar and meanings of words, the learner can hear how they are pronounced and see pictures and video clips that illustrate them. An impressive feature of this CD-ROM is the facility for linking the different reference works: e.g. it is possible to click on a word in the text of a transcript of a video sequence, look it up in order to check the meaning and then hear it pronounced in Received Pronunciation.

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## Appendix

### Author's update 2009

One would have thought that the situation described below should not arise these days but, apparently, it's still quite common.

The following is a summary of the main problems I encountered running two one-day courses in the summer of 2000: (i) in using the Web in language teaching, and (ii) in basic authoring tools: The university at which the courses took place shall remain nameless, but it's not untypical in my experience.

- i. *Internet Explorer 4.0* was installed on 15 out of 20 workstations on the local area network. Five machines had *Internet Explorer 5.0*. There were no plug-ins available for either version of IE, so I couldn't demonstrate how to access sound and video at websites. Javascript was also disabled.
- ii. *Acrobat* wasn't installed and couldn't be downloaded because downloads of plug-ins were forbidden by the local area network manager, so I couldn't demonstrate the downloading of PDF files. Downloading to the network server was generally discouraged, but we did manage to download a few HTML files, JPGs and GIFs to local floppy disks.
- iii. Only five out of 20 workstations could play sound and video using Windows *Media Player*. Only five out of 20 workstations were equipped with speakers or headphones. Only an earlier version (6.0) of Windows *Media Player* version was available, so I used Version 7.0 on my laptop to demonstrate what could be done capturing and playing back sound files in various formats.
- iv. I wanted to demonstrate a variety of multimedia CD-ROMs, but the network manager didn't know how to install them on the central server, and there were restrictions on what could be installed on individual workstations. Fortunately, I was able to demonstrate a selection of CD-ROMs on my laptop.
- v. No workstation had a microphone, so interaction with CALL programs was limited to text input and point-and-click with the mouse. I was able to demonstrate speech recognition on my laptop.
- vi. *Windows Recorder* was disabled on all machines, so it would have been impossible to demonstrate the production of sound recordings even if microphones had been available. Once again, my laptop came to the rescue and I was able to demonstrate *Windows Recorder* and *SoundBlaster WaveStudio*.
- vii. No graphics manipulation packages were available on the local area network. I had intended to demonstrate how combinations of edited text, pictures and sound could be slotted into a simple authoring package using my own *GapKit* program and Wida's *Authoring Suite*, and I needed packages such as *Photoshop* or *LView Pro*. Thank God for my laptop again!

I had made it quite clear to the university what I required well in advance of the courses, but they ignored most of my requests.

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