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# CÆLL JOURNAL

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# AN OVERVIEW OF THE 9TH CONFERENCE ON TECHNOLOGY AND EDUCATION

*Vance Stevens, Sultan Qaboos University, Oman*

Convened ostensibly to assess progress made on recommendations made in 1989 by UNESCO, the ninth Conference on Technology and Education (CT&E) was held March 16-20, 1992 in Paris, France. European and American trends in educational technology are similar. However, comparing the number of papers on multimedia telecommunications in the USA at recent CALICO and TESOL conferences and the presentations at the CT&E suggests that Europe, perhaps due to its recent movement toward integration, is more active in exploiting the educational potential of multimedia telecommunications. The conference thus managed to adhere to some degree to its theme, "education sans frontières."

The CT&E had over a thousand participants from at least 40 countries (the country with the largest contingent appeared to be Texas, land of the conference co-sponsors). In the three days the conference was in full swing, there were 18 session-hours in which six simultaneous sets of three 20-minute presentations were scheduled in addition to numerous poster sessions and at least one hour-long address. Presenters focused on all aspects of K-12 and university curricula, with a smattering of business and industrial training presentations as well.

Though not many presentations specifically addressed language learning, most provided refreshing perspectives on multimedia applications, on exploiting computers as tools, on content-based instruction, and on sources for funding of projects. These perspectives, plus the communicative aspects of tele-networking, made this conference of more than passing relevance to CALL practitioners.

One interesting feature of the CT&E is its long-standing (since 1984) association with a corporate partner. Tandy and various subsidiaries planned the conference, provided computers and monitors in each presentation room, and set up a Novell-networked lab. The lab was where most hands-on demonstrations of various software applications (e.g., telecommunications environments, windows applications, process writing tools) took place.

Presenters were not charged equipment costs and in fact received a reduction in registration fees which, for individuals registering on-site, came to \$300 for just the three days of presentations (workshops, school visits, the formal dinner, and conference proceedings cost extra à la carte). The major disadvantage to having an MS-DOS based corporate partner is that, whereas there are no constraints on platform as criteria for having presentations accepted, you'd have to bring your own Mac or Amiga, or as many did instead, a video of it.

As all papers presented had been prepared and refereed in advance, the quality of presentations was reasonably high, and in most cases reported on completed research and working implementations, not simply on prototypes. (Compare this with the occasional admission at the most recent CALICO conference that the software shown was sketchy because "we did it last week," or with a presentation in a research colloquium at TESOL in Vancouver that was delivered entirely in the future tense.) On the other hand, presenters at CT&E who found it difficult to convey the scope of their projects in the allotted 20 minutes tended to refer the

audience to the proceedings for a fuller picture, and thus gloss over hard data. Their work already published, numerous presenters failed to appear, and the advertised software exchange didn't materialize, again for want of a reliable organizer.

In a keynote address, Jacques Hebenstreit, École Supérieure d'Electricité, France, made a useful distinction between polymedia (materials in various formats delivered through a collection of diverse peripheral devices) and real multimedia (text, images, sound, etc. available on the same hard disk and transmittable to another computer via the same signal). Although short of that ideal, multimedia and hypermedia were constant buzzwords at the CT&E. Demonstrations ranged in sophistication, but were always entertaining, like Owen Burgen's "Hypermedia Tour of Crocodile Dundee Country."

multimedia and hypermedia were constant buzzwords at the CT&E

### DESIGNING HYPERMEDIA

In a strikingly effective implementation, Wendy Hall and Gerard Hutchings, University of Southampton, repurposed a linear video to make video and animated illustrations of biology concepts available either through clicking on an index or on the text itself. They minimized disorientation when using their system by focusing the tasks assigned students and by providing an interactive logic-flow map in which each node is a button. Students can navigate the system by clicking on any node. Decreased disorientation was confirmed through research on different versions of the program. In another presentation relating to self-access of hypermedia features, Kyle Higgins and Randy Boone, University of Nevada, found a 65-70% access rate of features in a Mac-based hypermedia implementation of a reading course for K-2 reading.

Multimedia magician Harald Haugen, Stord College of Education, Norway, nimbly demonstrated how WINIX could be used to blend video with text more effortlessly even than with the QuickTime shown at CALICO (or so the magician made it appear). Haugen rapidly pulled from an icon-menu the buttons needed to control a videodisc in an image window. Students could then click on transcribed text to access hyperfeatures, or hear words repeated from the video—and if desired see graphic displays of pronunciation and speak into a microphone for comparison. Users could grab bits of any of these media for forwarding through WINIX's e-mail or conference facilities. Haugen had with him a Pen PC notebook computer with an Ethernet remote sender to eliminate cables, and he projected crisp video through a Norwegian-made ASK Impact 16.7 LCD panel.

On the technical side, Brenda Litchfield, University of South Alabama, presented a model for interactive videodisc component design based on Gagné's nine events of instruction. She stressed the importance of closely coordinating everyone's contribution, and of capturing the students' attention at the outset and holding it by using relevant materials whose purpose and transferability are made clear. Mark Turner, Western Washington University, echoed the need for planning in producing interactive video, noting that careful attention must be paid to props placement and hand and body posture so that scenes can be connected seamlessly in various ways to produce different outcomes. Turner's final product includes an undo feature allowing users to back up one decision at a time.

CD-ROM figured strongly in multimedia presentations. Gwyneth Windsor, Fulston Manor School, UK, decried "contrived" use

of CD-ROM and used hers instead as database for her own materials preparation, eventually handing this task over to the students themselves. The students prepare research papers from source material excerpted and cited directly from on-line resources. In a much more ambitious project, Jim MacGregor and Margaret Franklin, University of Sheffield, described a Wellcome Trust project which essentially put a museum on CD-ROM and allows databased access to slides and videodisc frames.

The museum is being used by medical students through the Challenge System, incorporating a knowledge base of diseases and their diagnoses, intelligent tutoring, questioning, and browse features. Students can "examine" patients by zooming in on increasingly detailed body parts to observe or even palpate, see medical records, order lab tests, hypothesize and receive feedback, manage treatment, and so on.

## EXPERT SYSTEMS

Another presentation of an expert system for learning was made by Armin Schmeling, Standard Elektrik Lorenz AG, Germany, who described the Dominic knowledge-based system which allows authors to structure a domain which the student can then browse or operate. In research to see how effective various media were, Schmeling found that text with photos produced most favorable results, while text with sound performed worse than text alone.

Herb Wideman, York University, Canada, conducted research in which his students set up their own expert systems as domain mastery and cognitive development exercises. The tasks included creating an ANIMALS-like system that would guess a sport, conceiving a system that would analyze weather data, and envisaging how a robot might approach certain problems. Results suggested that students best in rea-

soning abilities (as measured by metacognitive strategies, transfer rules, etc.) benefited from the tasks while students below the mean did not.

## MICROWORLDS FOR LEARNING

Seymour Papert, who addressed the delegates at the dinner and museum tour at the Centre Pompidou, has characterized spaces where students learn to function within a system's parameters as microworlds. An example was presented by Crystal Gips, Ohio University, and Terry Gips, University of Maryland, whose students programmed animated messages on an outdated paint package that forced input from command code lines. Their design was based on the assumption that coding teaches learners about the learning process itself, and that learners make information tangible and real by both writing and visualizing it.

Another interesting microworld was demonstrated by Ian Robert Gomersal, Bradford Grammar School, UK, whose software showed in animated diagrams what happens in electronic circuits when switches are thrown, resistors inserted, etc. Gomersal noted that some of the circuits had been incomprehensible even to experts until the animation clarified their operation. Besides being a striking illustration of a unique advantage computers have over any other educational medium, I find from a language teacher's perspective that such software gives students grounds for real communication (using language associated with process, sequence, and if/then, for example) even if they don't happen to be enrolled in an ESP language course for electrical engineers.

Microworlds become even more interesting when students can interact with other participants in them. Bobbi Kurshan, Athena Telematics, suggested that students might in the future enter virtual realities and communicate with others from within the perceived

environment. As implemented in Bullet-Proof Software's E-Scape, one peripheral needed is a kind of pod which participants must physically enter. More practical for educational budgets is Sierra On-Line's game network that lets participants design a face and then communicate with each other through the face designed.

## TELECONNECTING THE WORLD

You'd have to have been sleeping through the CT&E not to have encountered a dozen presentations concerning telecommunications. Kurshan mentioned some 20 educational networks available in the US. Among her ideas for using them: before having students write journals, have them access a database of famous journals to see models. Other practical network techniques were suggested by Susan W. Eskridge and Margaret A. Langer, University of the Pacific. For example, they select two facts about each student about to participate in an e-mail network, give the list of facts to the students, and then have students identify their counterparts by communicating enough to match up the descriptions.

Making the point that telecommunications-based educational projects encourage participants to expand on prior knowledge, John Meadows, Campus 2000, discussed projects in which schoolchildren in London and Australia worked out why it was summer here and winter there and compared data on the size and direction of their shadows. In another project entitled Euromoney, participants discussed what they earned and were given, how much pocket money they carried, how they spent their money, and so forth.

Access to telecommunications networks seems well within reach of educators at the moment, as there appears to be government and corporate backing of several projects. Campus 2000 funds numerous telecommu-

nications projects: for example, EDU2000 (a UK/France project involving 100 schools on either side of Channel) and a German project working through Tymnet ("schools get it cheap," says the presenter, "and we lose the money"). Astra satellite, relaying items such as German news, has been made available to 800 UK schools for 50 pounds a year, equipment and installation free of charge. Campus 2000 are looking for other international collaborative projects of cultural and linguistic interest. To give some idea of demand, they hope to engage the 16,000 teachers of Russian in Eastern Europe who are now going to have to teach English.

## CORPORATE FUNDING AND ETHICS

Another corporate source of telecommunications funding was presented by Robin Bronk, APCO Associates, and Al Gibb, Whittle Communications. Whittle produces Channel 1, a daily program with ten minutes of news and two minutes of commercials, which high schools agree to show to 80% of their students each day in exchange for \$60,000 worth of gear (e.g., satellite disk, video hookup, etc.). The schools benefit by acquiring technology provided by the corporate sponsors, but the inclusion of commercials makes the program a controversial one. Tim Foley, Lehigh University, addressed other sometimes controversial ethical issues in telecommunications and how abuse is dealt with at Lehigh. Considering that Internet, to take just one example, has 5000 networks and 500,000 host computers and is accessible in over 60 countries, there is a need for international policy on ethical issues.

In an example of telecommunications using ISDN phone lines, John C. Ittelson, California State University at Chico, described an interactive multimedia distance learning project. Utilizing diverse media

such as videodisc plus a studio-based live teacher, the project can reach individual remote locations and will soon interconnect several. It has already shown the need for a wider field of video view and improved quality of audio.

## CLASSROOMS WITHOUT WALLS

Another way to use computers in constructing learning environments was presented by Richard A. Chase and William G. Durden, Johns Hopkins University Center for Talented Youth. They described how students could log on to computers at participating museums and zoos in Baltimore to get school credit for what they were learning there. The scheme aims to remove the walls constraining the traditional classroom learning environment by efficiently mapping how, besides at school, young people can learn in a city.

Designers hope thus to maximize the educational use of available resources in an era of low funding. Maximal use of available resources is the principle guiding the work of Erik Duval, Leuven University, Belgium, who discussed development of a database of audio-visual material for education. The delivery system utilizes a satellite to make both information and images available via telecommunications. The database employs two approaches to searching: (a) simple keywords, and (b) navigation techniques, in which the software induces what people are getting at according to how they query the database.

## WHO'S GOT THE MONEY?

Some presentations focused on dollars as well as the sense in going multimedia. What does it cost to renovate a traditional

language lab into a modern learning center with four large rooms, six hex carrels, a Macintosh lab, EtherNet, e-mail, and interactive video lab with Adventures of Philippe, etc.? Bill Wyman, University of Colorado, managed this on a \$250,000 grant plus an equivalent figure in matching funds.

Sonia Hernandez, from the Texas Governor's Office, divulged that there will be a 56% increase in investment in educational technology in Texas in 1993. Nationwide, obsolete machines are being warehoused, so one targeted area for 1993 is getting these machines allocated to education. Her prediction: there will be millions

there will be millions of computers in US schools by the end of the decade

of computers in US schools by the end of the decade, and they will be American-made. Despite these encouraging figures, much gets done

with meager resources—one presenter remarked that her project had come to an end not because the grant ran out but because both CD-ROM machines were stolen.

## POWER FOR THE PEOPLE

Stifled by a traditional administration rooted in hierarchical bureaucracy where information equals power and senior management knows best? Blocked by a mainframe-oriented computer center that views technology as toys and has little interest in curriculum? Then follow the example of Ruth McLean, who, at Humber College, Canada, managed to reverse the situation through a committee of "stakeholders" (faculty, technicians, and administrators) with a budget of \$100,000 to \$400,000 and a mandate for replacing equipment and invoking corporate planning. Power has since diffused, and the values at Humber are becoming public, articulated, and curriculum-based. Change is now planned, resources

are shared, and it is possible to upgrade people and equipment while moving older machines to other areas.

### BETTER TEACHER SUPPORT

Besides students, teachers are the most crucial stakeholders in the successful integration of technology and education. In his opening address, Hebenstreit remarked that teacher training is important in overcoming the tutorial syndrome (the tendency for teachers to produce tutorials and drills in lieu of more imaginative and appropriate uses). Brian Durell, University of Toronto, pointed out that the kind of support teachers need is pedagogical, not technical, and warned that simplistic models lead to counterproductive effects, even de-skilling teachers, who might therefore expect computers to do their work for them.

Several telecommunications projects (for example, Margaret Kelly's California Technology Project, which distributes authentic foreign language videos in German, French, and Spanish) included materials support as part of the package, rather than leaving it to teachers to sort out what they were supposed to do with the welter of (e.g., authentic language) material.

Alfred Bork, University of California, Irvine, claimed that we need fewer teachers so we can pay existing teachers more; and therefore, computers **should** replace teachers. In his talk, which he subtitled "Rebuilding the educational systems of the known galaxy," Dr. Bork described his scientific reasoning programs, which are conversational and respond to free-form answers. His next project will be in ESL, but he hasn't yet found a suitable funding source.

To a teacher of English via CALL, the CT&E was an informative window on what is going on in areas not normally accessed through CALL channels, but which stimulate ideas relevant to the management and delivery of communicative language learning systems. As Paul Resta pointed out in his summary speech, the conference was about equity of access to technology and reaching students in remote locations.

we need fewer teachers  
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In keeping with the recent shift in view of the learning process (from students as processors of knowledge rather than as mere recipients), how this is to be accomplished through technology might be modeled at a conference in the presentations themselves. One hopes that this will be the case at the 10th Conference on Technology and Education to be held at Massachusetts Institute of Technology in Cambridge, Massachusetts, March 21-24, 1993.